

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TCT MOBILE, INC. AND TCT MOBILE (US) INC.,
Petitioner,

v.

WIRELESS PROTOCOL INNOVATIONS, INC.,
Patent Owner.

Case IPR2016-01861
Patent 9,125,051 B2

Before KEVIN F. TURNER, MITCHELL G. WEATHERLY, and
KAMRAN JIVANI, *Administrative Patent Judges*.

TURNER, *Administrative Patent Judge*.

FINAL WRITTEN DECISION

Determining Claims 1, 2, 4, 5, 21–23, 25, and 26 Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. BACKGROUND

TCT Mobile, Inc. and TCT Mobile (US) Inc. (collectively “TCT”) filed a petition (Paper 1, “Pet.”) to institute an *inter partes* review of claims 1, 2, 4, 5, 21–23, 25, and 26 (the “challenged claims”) of U.S. Patent No. 9,125,051 B2 (Ex. 1001, “the ’051 Patent”). 35 U.S.C. § 311. TCT supported the Petition with evidence including the declaration of Stuart J. Lipoff (Ex. 1005). Wireless Protocol Innovations, Inc. (“WPI”) timely filed a Preliminary Response. Paper 5 (“Prelim. Resp.”). WPI supported its Preliminary Response with evidence including the declaration of Gary Lomp, Ph.D. (Ex. 2001). On March 24, 2017, based on the record before us at the time, we instituted an *inter partes* review of claims 1, 2, 4, 5, 21–23, 25, and 26. Paper 8 (“Decision on Institution” or “Dec.”). We instituted the review on the following challenge:

References	Basis	Claims challenged
International Patent Publication No. WO 99/61993 (Ex. 1022, “Abi-Nassif”), Data-Over-Cable Service Interface Specifications, ¹ Radio Frequency Interface Specification, Second Interim Release, Document Control No. SP-RFiv1.1-I02-990731 (Ex. 1019, “DOCSIS 1.1”), and Alleged Admitted Prior Art (“APA”)	§ 103	1, 2, 4, 5, 21–23, 25, and 26

After we instituted this review, Patent Owner filed a Patent Owner Response in opposition to the Petition (Paper 19, “PO Resp.”) that was

¹ We refer to the first version of the Data-Over-Cable Service Interface Specifications as “DOCSIS.”

supported by a Second Declaration from Gary Lomp, Ph.D. (Ex. 2004). Petitioner filed a Reply in support of the Petition (Paper 24, “Reply”). Patent Owner did not move to amend any claim of the ’051 Patent.

We heard oral argument on December 7, 2017. A transcript of the argument has been entered in the record (Paper 32, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6(c). The evidentiary standard is a preponderance of the evidence. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons expressed below, we conclude that Petitioner has demonstrated by a preponderance of evidence that claims 1, 2, 4, 5, 21–23, 25, and 26 are unpatentable.

B. RELATED PROCEEDINGS

TCT and WPI identified as related proceedings the co-pending district court proceedings of *Wireless Protocol Innovations, Inc. v. TCL Corporation, et al.*, Case Number 6:15-cv-918 (E.D. Tex.) and *Wireless Protocol Innovations, Inc. v. ZTE Corporation, et al.*, Case Number 6:15-cv-919 (E.D. Tex.). Pet. 2–3; Paper 4, 2. Additional claims of the instant patent, specifically claims 6, 7, 9–12, and 14–19 of the ’051 Patent, are the subject of concurrent proceeding for *inter partes* review in IPR2016-01865.

WPI identified three issued U.S. patents and two pending U.S. patent applications as being related to the ’051 Patent including: U.S. Patent Nos. 7,173,921 B2, 8,274,991 B2, and 8,565,256 B2; and U.S. Application Nos. 14/078,246 and 14/805,051. Paper 4, 3. The following *inter partes* reviews initiated by TCT are also considered related:

Proceeding	Patent No.	Status
IPR2016-01492	6,381,211 B2	Motion for adverse judgment granted: June 6, 2017
IPR2016-01494	8,274,991 B2	Final Written Decision issued February 12, 2018
IPR2016-01700	6,381,211 B2	Motion for adverse judgment granted: June 6, 2017
IPR2016-01702	6,381,211 B2	Motion for adverse judgment granted: June 6, 2017
IPR2016-01704	8,565,256 B2	Final Written Decision issued March 1, 2018

C. THE '051 PATENT

The '051 Patent relates to “point-to-multipoint communication; in particular, the invention relates to control of contention for data slots by customer premises equipment in a wireless point-to-multipoint communication system.” Ex. 1001, 1:37–40. “Contention” is shorthand for the process by which many instances of customer provided equipment (one being a “CPE”) negotiate for assignment of data slots available from a base station controller (“BSC”). *Id.* at 1:44–55. The Specification identifies problems with conventional methods when two CPEs “collide” while requesting a data slot, especially when the traffic from the CPEs is not “bursty” (e.g., traffic generated by online games and voice sources). *Id.* at 1:59–2:12. To address such problems, the Specification suggests a system of “using a new state machine to control a contention state” that “includes a grant pending absent state in which the [CPE] is polled with a unicast

request slot.” *Id.* at 2:23–31. The Specification briefly describes the grant pending absent state as follows:

By virtue of the grant pending absent state, the customer premises equipment can request a data slot without entering into contention and generating excess contention traffic. After a suitable delay without more data being received to send upstream, the state machine can exit the grant pending absent state. This delay preferably is long enough for receipt of new non-bursty data for a communication, for example 50 ms.

Id. at 2:36–42.

Of the challenged claims, only claims 1 and 21 are independent, and dependent claims 2, 4, 5, 22, 23, 25, and 26 depend directly from either claim 1 or 21. *Id.* at 9:60–10:41, 12:35–13:31. Claim 1 is deemed representative and recites as follows:

1. A method of operating a wireless communication unit, comprising:

transmitting a first type request message to a base station controller (BSC) unit in a contention slot;

receiving an upstream data transmission grant from the BSC unit;

transmitting pending data to the BSC unit within a data slot specified by the upstream data transmission grant;

transmitting a second type request message to the BSC unit within the data slot, the second type request message indicative of an amount of data pending for upstream transmission;

receiving a subsequent upstream data transmission grant from the BSC unit;

transmitting a first additional pending data to the BSC unit in a specified subsequent data slot specified by the subsequent upstream data transmission grant;

transmitting an additional second type request message to the BSC unit within the specified subsequent data slot if there

is second additional pending data for transmission to the BSC unit;

on condition that there is no further second additional pending data for transmission to the BSC unit and if² new data becomes available for transmission to the BSC unit prior to expiry of a timeout, transmitting a third type request message to the BSC unit without contention, the third type request message indicating to the BSC unit that the new data awaits upstream transmission; and

on condition that there is no further second additional pending data for transmission to the BSC unit and no new data becomes available for transmission to the BSC unit prior to expiry of the timeout, operating the wireless communication unit in an idle state.

Id. at 9:60–10:26.

II. ANALYSIS

A. CLAIM INTERPRETATION

“A claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b); *see also* *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016) (affirming that USPTO has statutory authority to construe claims according to Rule 42.100(b)). When applying that standard, we interpret the claim language as it would be understood by one of ordinary skill in the art in light of the specification, and absent any special definition, we give claim terms their ordinary and customary meaning. *See In re Suitco Surface, Inc.*, 603 F.3d 1255, 1260 (Fed. Cir. 2010); *In re Translogic Tech.*,

² WPI asserts that the word “if” was erroneously included in issued claim 1 (PO Resp. 27, 45) and seeks to file a Certificate of Correction, discussed below, to address this error. As discussed below, we conclude that the inclusion or exclusion of the word “if” in claim 1 does not affect our analysis of that claim’s patentability.

Inc., 504 F.3d 1249, 1257 (Fed. Cir. 2007) (“The ordinary and customary meaning is the meaning that the term would have to a person of ordinary skill in the art in question.” (internal quotation marks omitted)). Only terms which are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

In the Decision on Institution, we acknowledged that TCT addressed the preambles of claims 1 and 21, and that WPI took no issue with the proposed constructions of those preambles “for purposes of [its] Preliminary Response.” Dec. 6. No claim terms were explicitly construed in the Decision on Institution. *Id.* WPI continues to have no dispute with TCT’s claim construction of the preamble, although WPI asserts that the transceiver, at least one processor, and a memory unit, of claim 21, do not constitute part of the preamble of that claim. PO Resp. 9–10. We agree with WPI that the recited elements of claim 21 are not part of the preamble, which TCT acknowledges. *See* Ex. 1001, 12:35–13:8; Reply 12.

WPI also argues that the broadest reasonable interpretation of “operating the CPE in an idle state if no new data arrives at the CPE within the first period of time,” as recited in claims 1 and 21, is “operating the [CPE] in an **idle state, in which the [CPE] awaits arrival of data packets to send as upstream data to the BSC, [on condition that]** no new data arrives at the CPE within the first period of time.” PO Resp. 10. In so arguing, WPI relies on a commensurate passage in the Specification describing idle state 20. *Id.* (citing Ex. 1001, 6:50–52).

TCT argues that we should reject WPI’s interpretation because the ’051 Patent does not define a special meaning for idle state and the cited

portion of the Specification merely describes one type of “idle state.”

Reply 9–10. The Specification provides another description of “idle state” that reads: “The state machine preferably also includes an idle state in which the customer premises equipment awaits arrival of data packets to send as upstream data to the base station controller.” Ex. 1001, 2:43–45. However, TCT asserts that all claims are unpatentable even if we were to accept WPI’s proposed interpretation. *Id.* at 11.

Based on our review of the Specification, we determine that both passages cited by the parties support WPI’s argument that “idle state” as used in claims 1 and 21 refers to a state in which the CPE awaits arrival of data packets to send as upstream data to the BSC. Accordingly, we adopt WPI’s interpretation of “idle state.”

However, we also note that the Specification describes at least two different states in which the CPE “awaits arrival of data packets to send as upstream data to the BSC.” For example, the CPE awaits arrival of data while it is still receiving unicast polling requests from the BSC. *See* Ex. 1001, 7:25–35 (describing grant pending absent state in which “CPE 13 can use [a] . . . unicast request slot to request a data slot” (i.e., without contention) for upstream data “if more data is received” by CPE 13). CPE also awaits arrival of data packets when it has no grant pending and is not receiving unicast polling requests from BSC 12. *Id.* at 6:50–52. The Specification refers to this type of state as “idle state 20.” The claimed “idle state” refers to the second of these two states in which CPE awaits arrival of data packets to send as upstream data.

B. THE PARTIES' POST-INSTITUTION ARGUMENTS

In our Decision on Institution, we concluded that the argument and evidence adduced by TCT demonstrated a reasonable likelihood that claims 1, 2, 4, 5, 21–23, 25, and 26 were unpatentable as obvious based on the challenges identified in the table in Part I.A above. Dec. 17. We must now determine whether Petitioner has established by a preponderance of the evidence that the specified claims are unpatentable over the cited prior art. 35 U.S.C. § 316(e). In this regard, we previously instructed Patent Owner that “any arguments for patentability not raised in the [Patent Owner Response] will be deemed waived.” Paper 9, 6; *see also In re Nuvasive, Inc.*, 842 F.3d 1376, 1381 (Fed. Cir. 2016) (holding that patent owner’s failure to proffer argument at trial as instructed in scheduling order constitutes waiver). Additionally, the Board’s Trial Practice Guide states that the Patent Owner Response “should identify all the involved claims that are believed to be patentable and state the basis for that belief.” Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012).

C. LEGAL STANDARDS

TCT challenges the patentability of claims 1, 2, 4, 5, 21–23, 25, and 26 on the grounds that the claims are obvious in light of Abi-Nassif, DOCSIS 1.1, and APA. To prevail in its challenges to the patentability of the claims, TCT must establish facts supporting its challenges by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with

particularity . . . the evidence that supports the grounds for the challenge to each claim”)). The burden of persuasion never shifts to WPI. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review).

The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), reaffirmed the framework for determining obviousness as set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). The KSR Court summarized the four factual inquiries set forth in *Graham* that we apply in determining whether a claim is reasonably likely to be unpatentable as obvious under 35 U.S.C. § 103(a) as follows: (1) determining the scope and content of the prior art, (2) ascertaining the differences between the prior art and the claims at issue, (3) resolving the level of ordinary skill in the pertinent art,³ and (4) considering objective evidence indicating obviousness or nonobviousness. *KSR*, 550 U.S. at 406 (citing *Graham*, 383 U.S. at 17–18). In an *inter partes* review, Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F. 3d 1364, 1380 (Fed. Cir. 2016). Thus, to prevail Petitioner must explain how the proposed combinations of prior art would

³ The parties do not dispute that a person having ordinary skill in the art refers to a person holding an undergraduate degree in electrical engineering or having an equivalent educational experience, and three or more years working in a relevant field employing digital communications technology to deliver telecommunication services, or alternatively a relevant field involving the design of telecommunication products. Pet. 5 (citing Ex. 1005 ¶ 33); PO Resp. 8.

have rendered the challenged claims unpatentable. With these standards in mind, we address each challenge below.

D. OBVIOUSNESS IN VIEW OF ABI-NASSIF, DOCSIS 1.1, AND APA

TCT argues that the combination of Abi-Nassif, DOCSIS 1.1, and APA renders claims 1, 2, 4, 5, 21–23, 25, and 26 unpatentable as obvious. Pet. 37–78. TCT frames its challenge based on this combination by analyzing it two ways, one with Abi-Nassif being modified by teachings in DOCSIS 1.1 and the APA, *id.* at 37–58, and another with DOCSIS 1.1 being modified by teachings in Abi-Nassif and the APA, *id.* at 58–78. We consider the pair of these separately identified challenges as if TCT had merely cast its challenge as being based on Abi-Nassif, DOCSIS 1.1, and APA considered together.⁴ For the reasons expressed below, we are persuaded that TCT has demonstrated by a preponderance of evidence that the combination of Abi-Nassif, DOCSIS 1.1, and APA renders claims 1, 2, 4, 5, 21–23, 25, and 26 unpatentable as obvious.

⁴ The predecessor to our reviewing court has previously explained that:

In a case of this type where a rejection is predicated on two references each containing pertinent disclosure which has been pointed out to the applicant, we deem it to be of no significance, but merely a matter of exposition, that the rejection is stated to be on A in view of B instead of on B in view of A, or to term one reference primary and the other secondary.

In re Bush, 296 F.2d 491, 496 (CCPA 1961).

1. Overview of *Abi-Nassif*

TCT contends that *Abi-Nassif* “discloses every limitation of the independent claims other than the trivial aspect of transitioning to an idle state if new data [do] not arrive ‘prior to expiry of a timeout.’” Pet. 21. *Abi-Nassif* describes a medium access control (“MAC”) protocol for coordinating access to a shared medium communication network such as data-over-cable using hybrid fiber-optic and coaxial cable. Ex. 1022, 3:6–9, 19:23–33. The MAC protocol provides rules for resolving collisions among secondary stations 104 as they request access to upstream channel 107. *Id.* at 20:19–21:9. The MAC protocol includes provisions for secondary stations to access the network using contention-free and contention-based methods. *Id.* at 21:10–22:20. *Abi-Nassif*

describes the operating states of its network as ACTIVE, INACTIVE, and CONTENTION and an ability for secondary station 104 to transition from INACTIVE to ACTIVE without entering into contention. *Id.* at 24:30–26:4, Fig. 9. *Abi-Nassif*’s Figure 9, reproduced to the right, is a

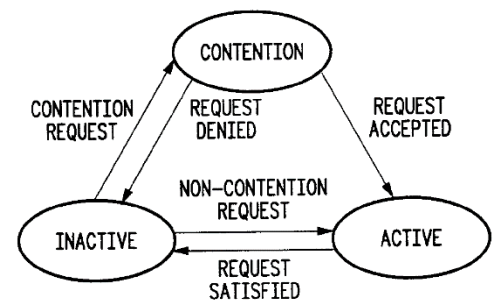


FIG. 9

state diagram reflecting these three states. Although the preferred embodiment of *Abi-Nassif* is a wired network, *Abi-Nassif* also suggests that its methods may be used over a wireless network. *Id.* at 19:32–20:2.

2. Overview of *DOCSIS 1.1*

DOCSIS 1.1 is a complex and detailed standard by which cable providers deliver internet services to subscribers. *See generally* Ex. 1019. It specifies interactions among various hardware in the network, which is schematically depicted at a high level in Figure 1-1 that is reproduced below.

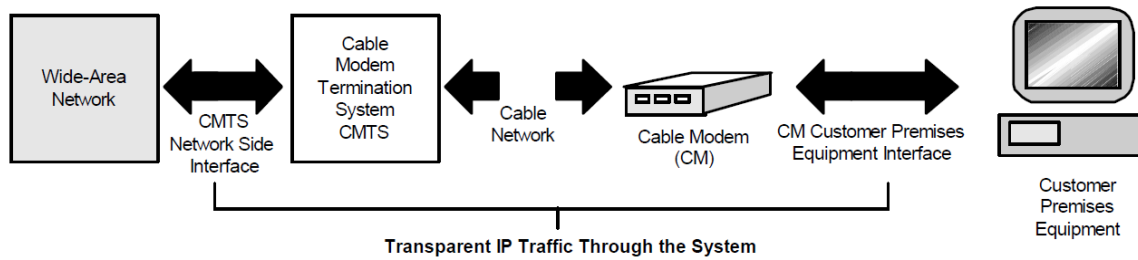


Figure 1-1 illustrates IP traffic over a “Data-Over-Cable” system.

Figure 1-1 illustrates the communication pathway from customer premises equipment to cable modems (“CM”), which relay data traffic over the cable network to a “cable modem termination system” (“CMTS”) located at the provider’s end. Ex. 1019 § 1.3.1. DOCSIS 1.1 uses a time division multiple access (“TDMA”) method for the CM to transmit data upstream in which the CMTS manages usage of time slots by CMs via a MAC protocol similar to the one discussed in Abi-Nassif. *Id.* §§ 3.5.2, 7.1. In operation, the CMTS regularly broadcasts a Bandwidth Allocation Map (“MAP”) message, which allocates upstream transmission opportunities (i.e., bandwidth) among the various CMs. *Id.* §§ 6.3.4, 7.1.1 *et seq.*, Appendix O (“Bandwidth Allocation Map”); Ex. 1005 ¶¶ 146–147.

The CMTS may broadcast an interval for requesting bandwidth, which the CMs interpret as an invitation to contend for bandwidth by sending requests during that interval. Ex. 1019 § 7.1.2.1, § 7.1.3. Alternatively, the CMTS may unicast an interval to a specific CM, which allows a specific CM to request a data slot without contending with other CMs. *Id.* DOCSIS 1.1 also offers enhanced quality of service (“QoS”), when compared to DOCSIS 1.0, in which certain types of data (e.g., voice over IP, high bandwidth FTP) that require high levels of network performance (e.g., high bandwidth, low latency, low jitter) are prioritized. *Id.* §§ 8.1.1.2, 8.1.6.

DOCSIS 1.1 describes the use of two “service flows” that use unicast polling to prioritize certain types of upstream data transmission. One, the real-time polling service (“rtPS”), enables the CM to reserve upstream data slots for real-time traffic like voice over IP (“VoIP”) while avoiding having to contend for those slots. *Id.* § 8.2.2, C.2.2.6.4; Ex. 1005 ¶ 191. The polling interval for the rtPS is on the order of tens of milliseconds or less. Ex. 1019 § 8.2.2. Another, the non-real-time polling service (“nrtPS”), reserves upstream data slots for applications like high bandwidth FTP transfers. *Id.* § 8.2.4. Like the rtPS, the nrtPS also allows the CM to reserve data slots without resorting to contention. *Id.*; Ex. 1005 ¶¶ 191–93.

3. Overview of APA

TCT contends that the ’051 Patent recognizes that “piggybacking (i.e., including a bandwidth request within transmitted data) is ‘[o]ne technique used in the prior art to reduce contention traffic.’” Pet. 35 (citing Ex.1001, 2:1–9, 6:1–9). TCT further contends that the piggybacking example details that the CPE attaches the size of its current data backlog to a header of a data packet sent upstream. *Id.* (citing Ex.1001, 2:4–6).

4. Claim 1

TCT contends that Abi-Nassif describes every claimed element (other than the timeout period recited in claim 1), Pet. 21, and DOCSIS 1.1 describes every claimed element “nearly identical[ly],” but using different terminology, *id.* at 27. TCT also explains in detail how the teachings of Abi-Nassif and DOCSIS 1.1 would have rendered the claimed methods obvious to an ordinarily skilled artisan. *Id.* at 37–51, 58–72. TCT also cites testimony from Mr. Lipoff in which he explains in great detail how specific

functionality within Abi-Nassif and DOCSIS 1.1 correlate to the specific steps recited in the claimed method and system. *Id.*

Claim 1 is directed to a method of operating a wireless communication unit through a series of steps performed by a CPE while communicating with a BSC over a link shared among other CPEs. The first three steps (1) involve transmitting a first type request message to the BCS in a contention slot, receiving an upstream data transmission grant, and then transmitting pending data to the BSC unit within a specified data slot. The next three steps (2) involve transmitting a second type request message, indicative of an amount of data pending for upstream transmission, to the BSC unit, receiving the grant, and transmitting a first additional pending data to the BSC unit. The next step (3) involves transmitting an additional second type request message if there is second additional pending data for transmission, with the following conditions:

on condition that there is no further second additional pending data for transmission to the BSC unit and [if] new data becomes available for transmission to the BSC unit prior to expiry of a timeout, transmitting a third type request message to the BSC unit without contention, the third type request message indicating to the BSC unit that the new data awaits upstream transmission; and

on condition that there is no further second additional pending data for transmission to the BSC unit and no new data becomes available for transmission to the BSC unit prior to expiry of the timeout, operating the wireless communication unit in an idle state.

Ex. 1001, 10:15–26. As discussed above, WPI asserts that the word “if” was erroneously included in issued claim 1, which is bracketed in the noted conditions above. PO Resp. 27, 45. In general, the use of the word “if” in a claim indicates a conditional limitation, i.e., one that need not be satisfied in

consideration of the proper scope of such a claim. *See Ex parte Schulhauser*, App. No. 2013-007847 (PTAB Apr. 28, 2016) (Precedential; determining that the broadest reasonable interpretation of a method claim having a conditional “if” limitation does not include the conditional steps.). Removing the word “if” from claim 1 narrows the scope of that claim, i.e., requiring consideration of the language after the word as well. We consider claim 1 below as omitting the word “if,” thus determining that the patentability of the broader claim 1, i.e., including the word “if,” would stand or fall with the patentability of the narrower claim.

WPI does not contest that Abi-Nassif, DOCSIS 1.1, and APA describe steps denoted as (1)–(3) above, but argues only that references fail to teach or suggest the conditions of claim 1 reproduced above, i.e., the last two elements. We conclude that TCT’s contentions regarding the steps denoted as (1)–(3) above are persuasive. *See* Pet. 37–51, 58–72. WPI argues that TCT acknowledges Abi-Nassif’s failure to disclose the “expiry of a time out” condition and instead relies on DOCSIS 1.1 for the teaching of such a condition. PO Resp. 25–26 (citing Pet. 47). WPI counters, however, that DOCSIS 1.1 has no teaching or suggestion of timeouts in connection with operating a unit in an idle state. *Id.* at 26 (citing Ex. 2001 ¶ 18). We address WPI’s specific arguments below.

WPI argues that TCT has misread Abi-Nassif as teaching that “unicast requests are used after piggybacking transmissions have ended.” *Id.* at 27–28 (citing Ex. 2001 ¶ 36). WPI also argues that “[t]he inevitability of transitions from contention-oriented to contention-free operations suggests nothing about a transition from one contention-free operation (*e.g.*,

piggybacking) to a different contention-free operation (*e.g.*, unicast requests).” *Id.* at 28–29 (citing Ex. 2001 ¶ 37). We do not agree.

As TCT points out, Abi-Nassif discloses that “[u]pon transmitting all of its data, the MAC User transitions back into the INACTIVE state,” but when new data to be transmitted are received, “a contention-free opportunity to transmit a request” is provided. Pet. 46; Reply 13–14 (citing Ex. 1022, 24:31–25:5, 25:17–21). Figure 9 of Abi-Nassif, reproduced above, illustrates the transitions from the ACTIVE state to the INACTIVE state and from the INACTIVE state to the ACTIVE state, with the latter through a non-contention request. Reply 14–15 (citing Ex. 1022, Fig. 9, 24:30–25:5, 25:17–21).

WPI also argues that TCT has misconstrued DOCSIS 1.1 by rearranging elements thereof, by moving functions of the CMTS to the cable modem. PO Resp. 29–30, 31–32, 35–36, 45–47, 52–53 (citing Pet. 48, 69–71; Ex. 2001 ¶¶ 40, 52–53). More specifically, WPI argues that the “Timeout for Active QoS Parameters,” relied upon by TCT, is not an operation of the cable modem, but rather an operation of the CMTS, correlated with the BSC of claim 1. *Id.* at 30, 46 (citing Ex. 2001 ¶¶ 41, 53). WPI continues that any incorporation of DOCSIS 1.1’s cited functionalities into the system of Abi-Nassif would result in deactivation to the primary station, contrary to claim 1. *Id.* We do not agree.

As TCT points out, claim 1 does not recite that the timeout must be maintained by the wireless communication unit, and that a person of ordinary skill in the art would have understood that “BSC could maintain the timeout and notify the wireless communication unit regarding the change in state of the timeout.” Reply 15–16 (citing Ex. 1001, 10:15–18, 10:24–25;

Ex. 1019, 251; Ex. 1057 ¶ 10). TCT also points out WPI's declarant acknowledged that the cited element of claim 1 would be met where the base station maintains the timer and then tells the wireless communication unit that the timeout has expired, as taught by DOCSIS 1.1. *Id.* at 16 (citing Ex. 1056, 79:19–25).

WPI also argues that DOCSIS 1.1 discloses that although one service flow is inactive, another service flow is still active, and finds that TCT's declarant acknowledges that at least one service flow is active at all times. PO Resp. 32–33, 48–52 (citing Pet. 51, 72–73; Ex. 2006, 32:8–10, 34:16–23, 41:13–22). WPI asserts that claim 1 requires operating the wireless communication unit in an “idle state,” and not merely operating with a service flow in an idle state. *Id.* We do not agree.

The instant ground of unpatentability relies on the combination of Abi-Nassif and DOCSIS 1.1 to teach an “idle state,” as pointed out by TCT. Reply 17–18 (citing Pet. 47–48). In the INACTIVE state of Abi-Nassif, the secondary station has unicast polling opportunities, where those polling opportunities would time out if not used, as taught by DOCSIS 1.1. *Id.* (citing Ex. 1022, 24:30–25:5, 25:20–21; Ex. 1019, 251). We are not persuaded that the INACTIVE state in Abi-Nassif necessarily differs from the claimed “idle state,” such that the combination suggests “operating the wireless communication unit is an idle state,” per claim 1.

With respect to the same aspect in DOCSIS 1.1, WPI also argues that the “idle state” shown in Figure K-1 of DOCSIS 1.1 is not associated with the “timeout” relied upon by TCT. PO Resp. 33–35 (citing Ex. 1019, 284, Fig. K-1; Ex. 2001 ¶¶ 18, 30, 45–46; Ex. 2004 ¶¶ 6–8). This is not persuasive, however, because the combination of Abi-Nassif and

DOCSIS 1.1 does not seek to incorporate the idle state of DOCSIS 1.1's Figure K-1, as noted by TCT. Reply 19.

Additionally, WPI argues that “DOCSIS 1.1 lacks the entire concept of a grant pending absent state,” and that “[c]laim 1 recites aspects of the grant pending absent state.” PO Resp. 44–45. Although it is correct that the specification of the '051 Patent discusses a “grant pending absent state,” as discussed above in Section I.C., the challenged claims do not recite such a limitation. As such, we are not persuaded that DOCSIS 1.1's omission of that specifically-recited state is problematic, given the discussions of Abi-Nassif, DOCSIS1.1, and APA, and their functionalities discussed above.

With respect to combining Abi-Nassif, DOCSIS1.1, and APA, TCT argues that because Abi-Nassif expressly incorporates DOCSIS 1.0, an ordinarily skilled artisan would have found it obvious to incorporate the revised DOCSIS 1.1 and its improvements into Abi-Nassif to provide higher QoS and increase the efficiency of Abi-Nassif's use of bandwidth. Pet. 49–50 (citing Ex. 1005 ¶¶ 264–270). TCT also argues that because Abi-Nassif explicitly incorporates DOCSIS 1.0 and DOCSIS 1.1 indicates that it is backward compatible with DOCSIS 1.0, an ordinarily skilled artisan would have used teachings in DOCSIS 1.1 relating to enhanced QoS features to improve the implementation of unicast polling already described in Abi-Nassif. *Id.* at 48–49 (citing Ex. 1005 ¶¶ 260–270).

WPI counters that motivation, arguing that the “expiration of the timer associated with a service flow causes that service flow to become inactive [per DOCSIS 1.1]” and that “[i]ncorporating such functionality from a service flow into the operation of the MAC User [per Abi-Nassif] would not cause the cable modem to operate in its idle state, but rather would end an

upstream transmission process for one service flow.” PO Resp. 36–37 (citing Pet. 49). This is not persuasive, however, in view of Dr. Lomp’s acknowledgement that a person of ordinary skill in the art would have looked to the DOCSIS protocol generally to figure out how to implement the system of Abi-Nassif. *See* Ex. 1056, 64:19–21.

Lastly, WPI argues that although TCT cites to an increase in the efficiency of the use of bandwidth as a motivation to combine Abi-Nassif and DOCSIS1.1, the release of transmission reservations, per DOCSIS 1.1, is distinct from permitting request opportunities to be released, and TCT has failed to demonstrate equivalence to show increased efficiency. PO Resp. 37 (citing Pet. 49–50; Ex. 2001 ¶ 41). TCT points out that DOCSIS 1.1 discloses that the intent of a service flow “is to reserve upstream transmission opportunities,” and that request opportunities are used to obtain transmission opportunities, used to make transmission reservations. Reply 21 (quoting Ex. 1019 § 8.2.2). Although we agree with WPI that the releases of transmission reservations and request opportunities are different, we are persuaded either can potentially provide for greater bandwidth use efficiency and would have motivated the combination of Abi-Nassif, DOCSIS 1.1, and APA.

For all the reasons expressed above, we determine that TCT has established by a preponderance of evidence that the combined teachings of Abi-Nassif, DOCSIS 1.1, and APA render claim 1 obvious.

5. Dependent Claims 2, 4, and 5

Based on our review of the record, we determine that TCT has demonstrated by a preponderance of evidence that the combined teachings of Abi-Nassif, DOCSIS 1.1, and APA render dependent claims 2, 4, and 5

unpatentable as obvious. WPI does not contend that the limitations introduced in claims 2 and 5 are a basis for patentability over the combination of Abi-Nassif, DOCSIS 1.1, and APA. PO Resp. 38, 53. Instead, WPI argues that claims 2 and 5 are patentable due to their dependency from claim 1 and the deficiencies that WPI marshals against TCT's challenges to claim 1. *Id.* Additionally, we are not persuaded that the deletion of the phrase "the contention free bandwidth request is," from claim 5, per the proposed Certificate of Correction, , discussed further below, changes the patentability analysis of claim 5.

With respect to claim 4, WPI asserts TCT's analysis of claim 4 "highlights the impropriety of Petitioner's reliance on the inactivity of the Polling Service Flow as the claimed 'idle state.'" *Id.* at 38, 54–55. WPI continues that TCT argues that only a particular service flow enters an inactive state, while one or more other service flows remains active, which is different from "operating the wireless communication unit in an idle state," per claim 1, from which claim 4 depends. *Id.* at 39, 55. However, we agree with TCT that this is a reiteration of the argument addressed above, with respect to claim 1. Reply 22. As discussed above, we conclude that having the primary service flow in DOCSIS 1.1 being "active" is not inconsistent with the CM being in an idle state. *See* Ex. 1057 ¶ 13. As such, with respect to claim 4, we determine that TCT has demonstrated by a preponderance of evidence that the combined teachings of Abi-Nassif, DOCSIS 1.1, and APA render dependent claim 4 unpatentable as obvious.

6. *Independent Claim 21*

With respect to independent claim 21, WPI points out that claim 21 includes three hardware elements, but substantially argues that TCT has

failed to demonstrate that the combination of references teach or suggest the conditions recited in claim 21, which are analogous to the conditions recited in claim 1. PO Resp. 40–41, 55–56.

With respect to the hardware elements of claim 21, TCT points out that the Petition identified elements of Abi-Nassif equivalent to those claim elements (Pet. 55–56) and that WPI’s declarant acknowledged that a person of ordinary skill in the art would have understood the needs to use such components to communicate with a base station, per claim 21. Reply 22–23 (citing Ex. 1056, 17:7–19:3). We further agree with TCT that WPI’s only other argument pertains to the last two, conditional limitations of claim 21, which we have analyzed above with respect to claim 1. *Id.* at 23, 30. As such, we determine that TCT has demonstrated by a preponderance of evidence that the combined teachings of Abi-Nassif, DOCSIS 1.1, and APA render dependent claim 21 unpatentable as obvious.

7. Dependent Claims 22, 23, 25, and 26

Based on our review of the record, we determine that TCT has demonstrated by a preponderance of evidence that the combined teachings of Abi-Nassif, DOCSIS 1.1, and APA render dependent claims 22, 23, 25, and 26 unpatentable as obvious. WPI does not contend that the limitations introduced in claims 22, 23, and 26 are a basis for patentability over the combination of Abi-Nassif, DOCSIS 1.1, and APA. PO Resp. 41, 53. Instead, WPI argues that claims 22, 23, and 26 are patentable due to their dependency from claim 21 and the deficiencies that WPI marshals against TCT’s challenges to independent claims 1 and 21. *Id.*

With respect to claim 25, WPI reiterates the arguments raised above with respect to claim 4. *Compare id.* at 42–43, 57–58, *with id.* at 38–40, 53–

55. We do not find the arguments more persuasive with respect to claim 25 than claim 4. As such, we determine that TCT has demonstrated by a preponderance of evidence that the combined teachings of Abi-Nassif, DOCSIS 1.1, and APA render dependent claim 25 unpatentable as obvious.

III. MOTION FOR CERTIFICATE OF CORRECTION

On July 14, 2017, we issued an Order authorizing WPI to file a motion for a Certificate of Correction pursuant to 35 U.S.C. § 254 and 37 C.F.R. § 1.322(a)(3). Paper 20 (the “Order”). The patentability of claims 1 and 5 as originally issued in the ’051 Patent, for which correction is sought, remain at issue throughout this proceeding. WPI filed its Motion, Paper 21 (the “Motion” or “Mot.”), and TCT filed its Response, Paper 22 (the “Response” or “Pet. Resp.”).

WPI seeks correction of claims 1 and 5, where both claims are among the claims challenged in this proceeding. Mot. 2. WPI argues that portions of the amendments made to those claims during prosecution “were not propagated to the issued patent.” *Id.* The alleged errors in claims 1 and 5 were evident no later than the issuance of the ’051 Patent on September 1, 2015. Ex. 1001, cover page (10).

WPI argues that the Office made mistakes that entitle WPI to seek correction of the ’051 Patent under 35 U.S.C. § 254, Mot. 1, which states:

Whenever a mistake in a patent, incurred through the fault of the Patent and Trademark Office, is clearly disclosed by the records of the Office, the Director may issue a certificate of correction stating the fact and nature of such mistake, under seal, without charge, to be recorded in the records of patents. A printed copy thereof shall be attached to each printed copy of the patent, and such certificate shall be considered as part of the original patent. Every such patent, together with such certificate,

shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form. The Director may issue a corrected patent without charge in lieu of and with like effect as a certificate of correction.

35 U.S.C. § 254. WPI asserts that the U.S. Court of Appeals for the Federal Circuit has held that Certificates of Correction issuing under § 254 do not have retroactive effect. Mot. 6. The Federal Circuit, in applying § 254, has held:

We conclude that this language requires that, for causes arising after the PTO issues a certificate of correction, the certificate of correction is to be treated as part of the original patent—i.e., as if the certificate had been issued along with the original patent. By necessary implication, for causes arising before its issuance, the certificate of correction is not effective.

Sw. Software, Inc. v. Harlequin Inc., 226 F.3d 1280, 1293–97 (Fed. Cir. 2000). As such, because this proceeding arose before a Certificate of Correction was issued, WPI asserts that the changes to claims 1 and 5 will not impact the current proceedings. Mot. 6.

TCT does not oppose entry of the Motion, but argues that this *inter partes* review should proceed as if the correction has already been entered, i.e., that we address the claims with the corrected language. Pet. Resp. 1. As discussed above, we have already determined that the change to claim 1 narrows claim 1, and we have analyzed claim 1 to find both versions, broader and narrower, to be unpatentable. *See* Section II.D.4. Similarly, we conclude that the change to claim 5 does not change the patentability analysis of that claim. *See* Section II.D.5.

Because we have determined claims 1 and 5 to be unpatentable, we determine that the correction of those claims is moot. The proposed

Certificate of Correction does not seek to alter any other claim or portions of the '051 Patent. Should claims 1 and 5 be revived through rehearing or appeal, corrections to those claims can be considered at that time. For these reasons, we deny as moot the Motion with respect to all issues presented.

IV. CONCLUSION

For the reasons stated above, we determine that TCT has demonstrated by a preponderance of the evidence that claims 1, 2, 4, 5, 21–23, 25, and 26 are unpatentable as obvious over the combined teachings of Abi-Nassif, DOCSIS 1.1., and APA; and we deny as moot the Motion for Certificate of Correction with respect to all issues presented.

V. ORDER

For the reasons given, it is:

ORDERED that claims 1, 2, 4, 5, 21–23, 25, and 26 of U.S. Patent No. 9,125,051 B2 are held to be *unpatentable* as obvious under 35 U.S.C. § 103 in view of the combined teachings of Abi-Nassif, DOCSIS 1.1, and APA;

FURTHER ORDERED that WPI's Motion for Certificate of Correction is *denied as moot*; and

FURTHER ORDERED because this is a final written decision, the parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Patent 9,125,051 B2

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