UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

WIRELESS PROTOCOL INNOVATIONS, INC.,
Patent Owner.

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IPR2016-01494
Patent 8,274,991 B2

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Before KEVIN F. TURNER, MITCHELL G. WEATHERLY, and
NATHAN A. ENGELS, *Administrative Patent Judges.*

WEATHERLY, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision on Remand
Determining All Challenged Claims Unpatentable
35 U.S.C. §§ 144, 318

I. INTRODUCTION

A. BACKGROUND

TCT Mobile, Inc. and TCT Mobile (US) Inc. (collectively
"Petitioner") filed a petition (Paper 2, "Pet.") to institute an *inter partes*
review of claims 1 and 3–5 (the "challenged claims") of U.S. Patent No.

8,274,991 B2 (Ex. 1001, "the '991 patent"). 35 U.S.C. § 311. Petitioner supported the Petition with evidence including the declaration of Stuart J. Lipoff (Ex. 1005). Wireless Protocol Innovations, Inc. ("Patent Owner") timely filed a Preliminary Response. Paper 7 ("Prelim. Resp."). Patent Owner supported its Preliminary Response with evidence including the declaration of Gary Lomp, Ph.D. (Ex. 2001). On February 13, 2017, based on the record before us at the time, we instituted an *inter partes* review of claims 1 and 3–5. Paper 8; *see also* Paper 10, 3 (correcting errors identifying claims and challenges for which *inter partes* review was instituted). We instituted the review on the following challenges to the claims:

Claims challenged	35 U.S.C. §	References
1, 3–5	103	Abi-Nassif[1], DOCSIS 1.1[2]
1, 3–5	103	Sen[3], APA,[4] Rydnell[5]

During the trial, Patent Owner filed a Patent Owner Response in opposition to the Petition (Paper 20, "PO Resp.") that was supported by a Second Declaration from Gary Lomp, Ph.D. (Ex. 2004). Petitioner filed a corrected Reply in support of the Petition (Paper 28, "Reply"). Patent

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[1] International Patent Publication No. WO 99/61993, published Dec. 2, 1999 (Ex. 1022, "Abi-Nassif").

[2] Data-Over-Cable Service Interface Specifications, Radio Frequency Interface Specification, Second Interim Release, Document Control No. SP-RFIv1.1-I02-990731 (1999) (Ex. 1019, "DOCSIS 1.1").

[3] U.S. Patent No. 6,466,544 B1, issued Oct. 15, 2002 (Ex. 1023, "Sen").

[4] Allegedly Admitted Prior Art ("APA").

[5] U.S. Patent No. 6,665,307 B1, issued Dec. 16, 2003 (Ex. 1024, "Rydnell").

Owner did not move to amend any claim of the '991 patent. We heard oral argument on December 7, 2017. A transcript of the argument has been entered in the record (Paper 35, "Tr.").

After considering the entire record, we issued a Final Written Decision ("Decision" or "Dec.") in which we concluded that Petitioner had demonstrated that claims 1 and 3–5 were unpatentable as obvious for two reasons. Paper 36, 13–37. First, we concluded that the combined teachings of Abi-Nassif and DOCSIS 1.1 rendered claims 1 and 3–5 unpatentable as obvious. *Id*. at 13–26. Second, we concluded that Sen alone rendered claims 1 and 3–5 unpatentable as obvious. *Id*. at 27–37. We did not express an opinion on Petitioner's challenges relying on the combined teachings of Sen, APA, and Rydnell. *Id*. at 36.

Patent Owner appealed our Decision to the Federal Circuit. *Wireless Protocol Innovations, Inc. v. TCT Mobile, Inc.*, 771 F. App'x 1012 (Fed. Cir. 2019). The Federal Circuit reversed our Decision that the combined teachings of Abi-Nassif and DOCSIS 1.1 rendered claims 1 and 3–5 unpatentable as obvious. *Id*. at 1018. The challenge to claims 1 and 3–5 as obvious in view of Abi-Nassif and DOCSIS 1.1 is thus not before us on remand.

The Federal Circuit also vacated our Decision finding that Sen alone rendered claims 1 and 3–5 unpatentable as obvious. *Id*. The Federal Circuit concluded that we erred in our interpretation of claim 1 and remanded the case for us to resolve whether Sen, the primary reference, met a limitation on the "grant pending absent state" of the customer provided equipment ("CPE") recited in claim 1 that neither party advocated during the trial. *Id*. at 1018–19; *see also* Pet. 64–65; PO Resp. 55–56 (not advocating any

particular interpretation of "grant pending absent state"). More specifically, the Court rejected our conclusion that the claims "do[] not preclude the sending of any data while the CPE is in the grant pending absent state." *Wireless Protocol*, 771 F. App'x at 1018; Dec. 34.

On remand, with our prior authorization, each party filed two briefs on the merits and was permitted to introduce additional evidence. Paper 55, 4–5 (authorizing an opening brief and reply brief for Petitioner, an opening brief for Patent Owner, and each party to submit additional expert testimony in support of their respective opening briefs); Ex. 3001 (authorizing Patent Owner's Sur-reply on remand). Accordingly, Petitioner filed an opening brief (Paper 56, "Remand Br." or "Remand Brief") that it supported with the Declaration of Stuart J. Lipoff in Support of Petitioner's Brief on Remand (Ex. 1050). Patent Owner filed an opening brief (Paper 63, "Remand Resp.") that it supported with the Declaration of Gary Lomp, Ph.D. in Support of Patent Owner's Response to Petitioner Opening Brief on Remand (Ex. 2016). Petitioner filed a Reply responding to Patent Owner's opening brief (Paper 67, "Remand Reply"). Patent Owner filed a Sur-reply responding to the Remand Reply (Paper 68, "Remand Sur-reply").

We conducted an oral hearing on October 19, 2020. (Paper 74, "Remand Tr.").

This Final Written Decision is issued pursuant to 35 U.S.C. §§ 144, 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 and 3–5 are unpatentable.

B. RELATED PROCEEDINGS

The parties identified as related proceedings the co-pending district court proceedings of *Wireless Protocol Innovations, Inc. v. TCL Corporation, et al.*, No. 6:15-cv-918 (E.D. Tex.) and *Wireless Protocol Innovations, Inc. v. ZTE Corporation, et al.*, No. 6:15-cv-919 (E.D. Tex.). Pet. 2; Paper 5, 2. Petitioner also identified as related proceedings the following closed district court proceedings: *WI-LAN Inc., et al. v. Research In Motion Limited et al.*, No. 3:13-cv-2431 (N.D. Tex.) and *Wi-LAN Inc., et al. v. Research In Motion Limited et al.*, No. 1:13-cv-21662 (S.D. Fla.). Pet. 2–3; Paper 5, 3. Patent Owner identified three issued U.S. Patents and one pending U.S. Patent Application as being related to the '991 patent including: U.S. Patent Nos. 8,565,256 B2; 9,125,051 B2; and 9,154,961 B2 and U.S. Application No. 14/805,051. Paper 5, 3–4. Although not identified by either party, U.S. Patent No. 8,565,256 B2 is the subject of a petition for *inter partes* review filed by Petitioner in IPR2016-01704, and U.S. Patent No. 9,125,051 B2 is the subject of petitions for *inter partes* review filed by Petitioner in IPR2016-01861 and IPR2016-01865.

C. THE '991 PATENT

The '991 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, 1:27–29. "Contention" is shorthand for the process by many CPEs negotiate with a base station controller ("BSC") to obtain a data slot from the BSC. *Id*. at 1:31–42. 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 1:43–2:6. To address such problems, the Specification suggests a system
of "using a new state machine to control contention" that "includes a grant
pending absent state in which the [CPE] is polled with a unicast request
slot." *Id*. at 2:10–18. 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 2:23–29. When in the grant pending absent state, the CPE need not
have data to send upstream but, once the CPE does have data to send, it can
use the non-contention unicast request slot to send that data rather than
having to negotiate for a new data slot using contention. *Id*. at 2:66–3:3.
When in a grant pending state, the CPE can hold its granted data slot by
using "piggybacking to request grant of a next data slot while sending
upstream data to BSC." *Id*. at 7:17–19. Thus, the CPE can seek bandwidth
for transmitting data using the following three ways: (1) sending a
contention request while the CPE is idle or deferring, (2) responding to
unicast polling during a specified period of time after the CPE finishes
sending data within a slot obtained via contention, and (3) piggybacking
while the CPE is sending data within a slot obtained via contention.

Of the challenged claims, only claim 1 is independent, and dependent
claims 3–5 ultimately depend from claim 1. *Id*. at 11:39–12:40. Claim 1 is

directed to a "method for obtaining uplink (UL) transmission bandwidth"
and recites:

> 1. A method for obtaining uplink (UL) transmission
> bandwidth in a point-to-multipoint communication system,
> where a customer premises equipment (CPE) is communicating
> with a base station controller (BSC) over a link shared with other
> CPEs, comprising the steps of:
>
>> operating the CPE in a grant pending state wherein the CPE
>> awaits receipt of a bandwidth grant from the BSC, receives
>> the bandwidth grant, transmits data to the BSC using the
>> granted bandwidth, transmits further bandwidth requests
>> using the granted bandwidth and transitioning from the
>> grant pending state to a grant pending absent state once
>>
>>> the CPE has transmitted upstream data to the BSC within
>>> a bandwidth specified by the bandwidth grant received
>>> from the BSC during the grant pending state and
>>>
>>> the CPE has no pending bandwidth requests;
>>
>> operating the CPE in the grant pending absent state awaiting
>> arrival of data for transmission to the BSC and
>> transmitting a first type bandwidth request to the BSC
>> without entering into contention when the CPE receives
>> data for transmission;
>>
>> transitioning operation of the CPE from the grant pending
>> absent state to the grant pending state after a subsequent
>> bandwidth grant is received at the CPE; and
>>
>> transitioning operation of the CPE from the grant pending
>> absent state to an idle state if the CPE does not transmit
>> any first type bandwidth request to the BSC during a
>> timeout period.

Id. at 11:39–2:26.

The "first type bandwidth request" recited above corresponds to the
CPE responding to a unicast polling request from the BSC with an indication

that the CPE has data to send. The Specification describes this type of
bandwidth request as follows:

> During grant pending absent state 23, CPE 13 sends no
> upstream data to BSC 12. No grant is pending because
> piggybacking was not used in the previous transmission of data
> to BSC 12 (hence the name of the state). Rather, *CPE 13 is
> periodically (e.g., every 10 ms) polled by BSC 12 with a unicast
> request slot. CPE 13 can use this unicast request slot to request
> a data slot for sending upstream data to the base station
> controller*. Thus, if more data is received by . . . CPE 13 to send
> upstream to BSC 12, CPE 13 can request a data slot without
> going through contention, thereby reducing contention traffic.

Id. at 7:24–35.

Claim 3, which depends directly from claim 1, recites a method in
which "the CPE is further operated in a deferring state in which the CPE
determines when to transmit a second type bandwidth request." *Id*.
at 12:31–33. The "second type bandwidth request" refers to a contention-
based request for bandwidth (i.e., a "REQ message"). *Id*. at 6:57–7:9.

Claim 5, which depends directly from claim 1, recites a method in
which "in the grant pending state, the CPE transmits a third type bandwidth
request in the bandwidth allocated to the CPE for transmitting upstream
data." *Id*. at 12:37–40. The "third type bandwidth request" refers to a
piggybacking type request. *Id*. at 7:17–19.

<div align="center">II. ANALYSIS</div>

A. THE SCOPE OF THE REMAND FROM THE FEDERAL CIRCUIT

The Federal Circuit held that, when considering Petitioner's
challenges based on Sen on remand, we must interpret the claimed "'grant
pending absent state' as properly construed not to permit the transmission of

upstream data while the CPE is in that state." *Wireless Protocol*, 771 F. App'x at 1018.

Patent Owner argues that the only issue to be addressed on remand is whether Sen expressly describes the claimed grant pending absent state and that Petitioner may not argue that it would have been obvious to an ordinarily skilled artisan to modify Sen's mobile stations to operate in the claimed grant pending absent state. Remand Resp. 12. We disagree.

Patent Owner rests its argument on our remand Scheduling Order (Paper 55 (the "Order")), which states: "Petitioner is authorized to file an opening Brief, of up to 15 pages, no later than 30 days after the date of this Order, with the subject matter of that Brief *limited to the issue* of whether Sen *describes* operating a CPE in a grant pending absent state as interpreted by the Federal Circuit." Remand Resp. 12 (quoting Paper 55, 4–5 (with emphasis shown)). Patent Owner's argument thus rests upon the premise that our use of "describes" in our Scheduling Order precludes Petitioner from arguing obviousness on remand because Sen suggests the grant pending absent state to an ordinarily skilled artisan. Patent Owner's argument is unpersuasive for at least three reasons.

First, the Federal Circuit's decision, which defines the scope of the remand, states:

> We do not here prejudge what arguments [Petitioner] has properly preserved or should now be permitted to advance or what determinations as to Sen, Rydnell, and admitted prior art are supported by the evidence when the evidence is assessed under "grant pending absent state" as properly construed not to permit the transmission of upstream data while the CPE is in that state.

Wireless Protocol, 771 F. App'x at 1018. The Federal Circuit thus directs us to reconsider the challenges advanced by Petitioner during the trial based upon Sen, Rydnell, and the admitted prior art in view of the correct interpretation of the "grant pending absent state" without placing limits on the analysis.

Second, consistent with the Federal Circuit's directive, our Scheduling Order expressly noted that we wished to receive new evidence on how Sen addressed the concept of a grant pending absent state as interpreted by the Federal Circuit as follows: "Because the Federal Circuit's interpretation of 'grant pending absent state' was neither proposed nor addressed by either party during the trial, the panel wishes to receive additional expert testimony to assist us in determining whether Sen describes operating a CPE in the 'grant pending absent state.'" Paper 55, 3.

Third, to the extent that Patent Owner's argument implies that Petitioner is now limited on remand to arguing that Sen anticipates claims 1 and 3–5, the argument is unpersuasive. Petitioner challenged claims 1 and 3–5 as being obvious in view of Sen, Rydnell, and the admitted prior art. Pet. 4, 61–69. Petitioner argued that Sen teaches transitioning from the grant pending state to the grant pending absent state. *Id*. at 64–65. Also, Petitioner contended that Sen teaches the grant pending absent state by transmitting control packets rather than data as follows:

> Sending a "control packet" in *Sen*'s Packet Standby state teaches this limitation. The Packet Standby state 44 permits the MS to stay connected to the network even though it does not need to send any data, thereby facilitating a fast switch from the inactive state to being able to transmit data immediately when the MS becomes active (*i.e.*, has data to transmit). Ex.1023 at 4:49-53; Ex.1005 ¶342. In the Packet Standby state, the MS

has a reduced amount of bandwidth assigned to it. Ex.1023
at 4:53-57. When data again needs to be transmitted, the MS
can transmit a "control packet" in Packet Standby state to request
more bandwidth. Ex.1023 at 4:55-63; 5:38-45; 5:57-65. In this
way, the MS quickly reverts to the Packet Transfer state 42
without having to enter into contention. *Id.* at 4:64-66;
5:66-6:11.

Pet. 65–66.

Patent Owner did not argue otherwise during the trial. PO
Resp. 55–56. Nor did Patent Owner argue during the trial that the grant
pending absent state should be interpreted to preclude any transmission of
data by the CPE in that state. *Id.* The parties simply never raised or
addressed whether Sen suggests the grant pending absent state as interpreted
by the Federal Circuit. Because the Federal Circuit interpreted "grant
pending absent state" in a manner that neither the parties nor the Board
contemplated during the trial, we have allowed both parties to provide
argument and evidence to assist us in determining whether Sen teaches the
"grant pending absent state" as interpreted by the Federal Circuit within the
context of Petitioner's obviousness challenge to the claims.

We will not read our use of "describes" in the Scheduling Order as
limiting the scope of inquiry on remand solely to whether Sen expressly
describes operating a CPE in the grant pending absent state as interpreted by
the Federal Circuit. Doing so would be inconsistent with the Federal
Circuit's mandate and unduly limit the scope of Petitioner's original
argument for unpatentability of claims as obvious in view of Sen and other
prior art. Accordingly, we consider the parties' arguments and evidence on
the issue of whether Sen expressly describes or suggests operating a CPE in
the grant pending absent state as interpreted by the Federal Circuit.

B. LEGAL STANDARDS OF OBVIOUSNESS

To prevail in its challenges to the patentability of the claims,

Petitioner 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) (2016). "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")). This burden never shifts to Patent Owner. *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 Court in

KSR 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,[6] and (4) considering objective evidence indicating obviousness

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[6] 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

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

C. OBVIOUSNESS IN VIEW OF SEN

1. Overview of Sen

Sen discloses a wireless General Packet Radio Service ("GPRS") that purports to use a novel MAC protocol to improve delivery of real-time data traffic like speech, video, multimedia, and VoIP that is sensitive to delays in transmission. Ex. 1023, Abstract, 1:6–9, 1:47–49. Sen's protocol supports wireless data transmission between mobile stations and a base station. *Id*. at 2:49–67, Figure 1. Sen enables a mobile station to resume transmitting data without re-entering a contention state as a way of improving the quality of service for "delay-sensitive, real-time GPRS traffic." *Id*. at 4:50–5:3. Sen describes a:

> Packet Standby state 44 [that] permits the MS 26 to stay connected to the network 10 through a physical channel even though it may not need to send any data. This facilitates a fast switch from the inactive state to being able [to] transmit data immediately when the MS 26 becomes "active."

deliver telecommunication services, or alternatively a relevant field involving the design of telecommunication products. Pet. 5 (citing Ex. 1005 ¶ 32); PO Resp. 6.

Id. at 4:50–55. The relationship among Packet Standby state 44 and other
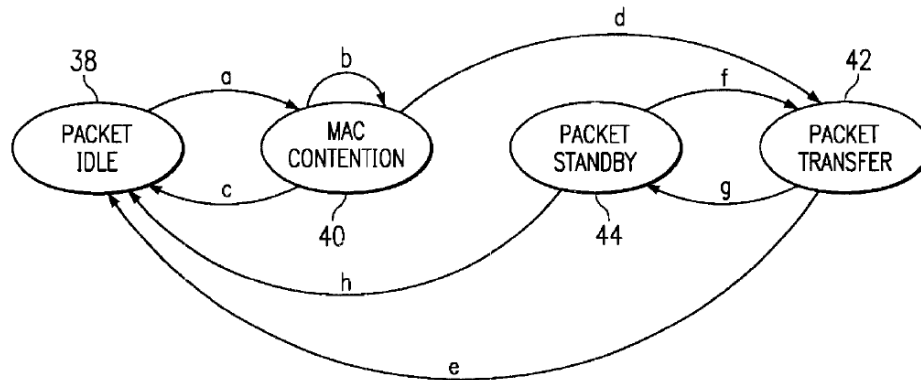
states is shown in Figure 4, which is reproduced below.

Fig. 4

Sen's Figure 4 illustrates network states in Sen's communication
system including "packet standby" state 44.

Sen's mobile station (MS) 26 "can quickly revert" from Packet Standby

state 44 to Packet Transfer state 42 as shown by arrow f above "without

having to go through MAC Contention state 40 again." *Id*. at 4:64–67.

*2. Whether Sen Expressly Describes the Operating CPE in a Grant
Pending Absent State*

Petitioner argues that Sen expressly discloses operating a mobile

station in the claimed grant pending absent state because Sen's Packet

Standby state 44 permits its mobile station to return to Packet Transfer

state 42 by sending a control packet without transmitting data. Remand

Br. 8–10. Put another way, Petitioner argues that Sen teaches an

embodiment that does not *require* transmitting upstream data in the Packet

Standby state 44. *Id.* at 8–9 (citing Ex. 1023, 1:61–63; Ex. 1050 ¶¶ 12–16).

Petitioner contends that Sen expressly describes two alternatives for

transitioning from its Packet Standby state 44 to its Packet Transfer state 42,

with one of the alternatives constituting a transition from the claimed grant

pending absent state to the claimed grant pending state. *Id*. at 9–10 (citing

Ex. 1023, 5:40–44). Sen describes the two alternatives for transition as follows: "The base station receives the packets and re-allocates the bandwidth to the mobile station, when a first one of the packets is received by the base station *or* when the base station receives a control packet requesting more bandwidth." Ex. 1023, 5:40–44 (emphasis added). Petitioner points out that Sen further describes sending a control packet without transmitting data by stating "[i]n some embodiments, the base station re-allocates the bandwidth to the mobile station, when a control message requesting more bandwidth is received by the base station." Remand Br. 9 (citing Ex. 1023, 2:1–3); Remand Tr., 9:1–10 (explaining the same). Taking these disclosures together, in Petitioner's view, Sen discloses alternative embodiments for transitioning and thus, Sen explicitly teaches a "control packet" embodiment in which "a mobile station transmits a control packet (or a 'control message') requesting more bandwidth to the base station." *Id.* (citing Ex. 1023, 2:1–3; Ex. 1050 ¶¶ 16–21).

Patent Owner argues that Petitioner's position is fundamentally flawed because it is premised on an incorrect reading of the Federal Circuit's claim construction. Remand Resp. 5. Specifically, Patent Owner argues that rather than considering whether a mobile station is permitted to send upstream data while in Sen's Packet Standby state 44, Petitioner incorrectly considers whether a mobile station is *required* to send upstream data. *Id.* at 5–6. Patent Owner argues that the proper question on remand is whether Sen's Packet Standby state 44 does not permit the mobile station to send upstream data packets. *Id.* at 5–6 (citing *Wireless Protocol Innovations*, 771 F. App'x at 1018; Ex. 2016 ¶¶ 17–18). We agree with Patent Owner. Under

the Federal Circuit's construction, the "grant pending absent state" does *not* "permit the transmission of upstream data." *Id.*

Patent Owner persuasively responds that Sen does not describe a separate embodiment in which the Packet Standby state 44 does not permit the transmission of upstream data and only control packets are transmitted. Remand Resp. 6–11. Rather than describing alternative embodiments, Patent Owner argues that Sen describes a mobile station that "can request more bandwidth by *either* sending a data packet *or* a control packet from Packet Standby state." *Id.* at 7 (citing Ex. 2016 ¶ 19). We agree, as none of the portions of Sen cited by Petitioner explicitly states that transmitting upstream data is not permitted. *Id.* At best, Petitioner directs us to Sen's description that "[i]n some embodiments, the base station re-allocates the bandwidth to the mobile station, when a control message requesting more bandwidth is received by the base station." Ex. 1023, 2:1–3. However, we agree with Patent Owner that "[t]he fact that the MS in Packet Standby state 44 can send control packets to request more bandwidth does not negate Sen's express teaching that the MS is also permitted to send upstream data packets while in Packet Standby state. Remand Resp. 7 (citing Ex. 2016 ¶ 19); Ex. 1023, 4:57–63. Moreover, as Dr. Lomp points out, Sen's description "relates to what the base station can do, not what the MS cannot do, and that only the latter is relevant here." Ex. 2016 ¶ 19.

Other portions of Sen similarly fail to describe an embodiment in which Sen's Packet Standby state 44 prohibits a mobile station from transmitting upstream data. Remand Resp. at 2 (citing Ex. 2016 ¶ 8). For example, as pointed out by Patent Owner, in Sen's Packet Standby state 44, "a mobile station receives 'a reduced portion of the bandwidth.'" *Id.* (citing

Ex. 1023, 1:58–59; Ex. 2016 ¶ 9). Sen describes how the reduced portion of the bandwidth permits a mobile station in the grant pending absent state to transmit data while in the Packet Standby state 44 as follows:

> The Packet Standby state 44 permits the MS 26 to stay connected to the network through a physical channel even though it may not need to send any data. This facilitates a fast switch from the inactive state to being able [sic] transmit data immediately when the MS 26 becomes "active." The MS 26 can then transmit the packets via the reduced amount of the original bandwidth when the packets again need to be transmitted.

Id. (quoting Ex. 1023, 4:50–57; citing Ex. 2016 ¶¶ 10–11). Patent Owner points out that the data permitted to be transmitted include "data packets" which may include speech, video, multimedia, and/or any type of real-time service. *Id.* at 3 (citing Ex. 1023, 4:57–63; Ex. 2016 ¶ 12). In light of the ability to transmit data packets while in the Packet Standby state 44, we agree with Patent Owner that Sen fails to teach that the Packet Standby state 44 does not "permit the transmission of upstream data while the CPE is in that state." *Id.* (citing *Wireless Protocol Innovations*, 771 F. App'x. at 1018).

After consideration of the arguments and evidence of record, we are persuaded that Sen fails to explicitly teach the claimed grant pending absent state as construed by the Federal Circuit.

3. Whether It Would Have Been Obvious to Modify Sen to Include an Operating CPE in a Grant Pending Absent State

Petitioner alternatively argues that "even if Sen did not expressly teach a Packet Standby state in which no data packets are sent, one of skill in the art would nonetheless find it obvious to implement one." Remand Br. 10 (citing Ex. 1050 ¶ 22). Petitioner relies on the Declaration of Mr. Lipoff who explains:

As a general matter, one of skill in the art would understand that different types of packets that can be transmitted are alternatives that can be used exclusively or in combination. For example, if a reference taught that a system could transmit both audio and video, a skilled artisan would readily understand that it could be modified to transmit only audio or only video. Here, if Sen is understood to teach that both data packets and control packets could be transmitted in the Packet Standby state, one of skill in the art would readily understand that the system could be implemented transmitting either only data packets or only control packets in the Packet Standby state.

Ex. 1050 ¶ 23. Moreover, Petitioner argues that modifying Sen to permit only sending control packets while in the Packet Standby state 44 would retain the key advantage of allowing the mobile station to "quickly revert to the Packet Transfer state 42 when required without having to through the MAC Contention state again." Remand Br. 11 (quoting Ex. 1023 at 6:6–9).

Petitioner argues that an ordinarily skilled artisan would have been motivated to modify Sen's Packet Standby state 44 to permit only the transmission of control packets. *Id.* at 12. Specifically, Petitioner, relying on the Declaration of Mr. Lipoff, asserts that transmitting control packets requires less bandwidth than transmitting data packets. *Id.* at 13 (citing Ex. 2050 ¶ 25); Remand Tr. 16:2–9 (explaining the same). For that reason, Petitioner argues that an ordinarily skilled artisan would have been motivated to maximize the amount of available bandwidth for mobile stations in the Packet Transfer state by "reducing the bandwidth available in the packet standby state to an amount sufficient to send a control packet but less than necessary to send data packets." *Id.* at 12 (citing Ex. 1050 ¶¶ 25–26).

Patent Owner argues that Petitioner's proposed modification of Sen fails on the merits because it is not adequately supported by evidence and

because it would introduce disadvantages such that an ordinarily skilled in artisan would not make the modification. *Id.* at 12–15. First, Patent Owner argues that Petitioner's argument "rests on the conjecture that disabling upstream data transmission in Packet Standby state ***could*** reduce bandwidth usage by an MS in that state, which bandwidth could be reallocated to other mobile stations in Packet Transfer state." *Id.* at 12 (citing Remand Br. 13; Ex. 1050 ¶¶ 25–26), 14 (citing *ActiveVideo v. Verizon*, 694 F.3d 1312, 1327–28 (Fed. Cir. 2012)); Paper 74, 23:12–26 (explaining the same).

Further, Patent Owner asserts that Petitioner's argument fails to consider the potential harm and disadvantages of the proposed removal of data packet transmission. *Id.* at 13 (citing *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 (Fed. Cir. 2000); Ex. 2015, 57:22–58:15). For example, Patent Owner's expert, Dr. Lomp, testifies that limiting Sen's Packet Standby state 44 to only sending control messages could disadvantageously decrease bandwidth stating

> [A]pplications in a mobile device often need to send important control-like requests to the base station, such as in-band signaling. Those requests are sent by the MS as data packets, but contain only a very small amount of information, on the order of tens of bytes, comparable to the size of a single control packet. At the relevant time, the ability of the MS to immediately send such data packets through the base station to the relevant application service without latency would have been significant in the context of delay-sensitive and real-time applications, such as "speech, video, multi-media, and/or any type of real-time service."
>
> . . . .
>
> A POSA would have further understood—from Sen's explicit teachings—that if the MS could not send data packets "immediately" from Packet Standby state 44, and instead were required to wait for bandwidth allocation from the base station

as Mr. Lipoff and [Petitioner] have proposed, the MS could suffer "Quality of Service degradation, such as speech clipping, while switching from a state of inactivity (empty packets) to a state of activity (non-empty packets)," and "[h]ence, good-quality, real-time service [could] not be provided because the MS must wait for the original bandwidth to be provided before sending any messages."

Ex. 2016 ¶ 27 (citing Ex. 1023 4:41–46, 4:57–61); *see also id.* at ¶¶ 25–26, 28–30; Remand Resp. 13.

Finally, Patent Owner argues that the proposed modification would change the principle operation of Sen in a manner that is unlikely to motivate a person of ordinary skill in the art to pursue the modification. Remand Resp. 14–15. Specifically, Patent Owner argues that the primary purpose of Sen is to "support delay-sensitive, real-time traffic." *Id.* at 14 (citing Ex. 1023, 1:41–49; Ex. 2016 ¶ 28; Decision 27). According to Patent Owner, this purpose is achieved by "allowing its MS to always send data from Packet Standby state 44, which 'saves valuable time (up to several hundred milliseconds) and permits delay-sensitive, real-time GPRS traffic (e.g. VoIP) to be provided to users of the network 10.'" *Id.* (quoting Ex. 1023 at 4:67-5:3; citing Ex. 2016 ¶ 28). Patent Owner argues that Petitioner's proposed modification would frustrate Sen's primary purpose by forcing the mobile station to "wait for a control packet to request bandwidth from the base station, and for the base station to allocate that bandwidth." *Id.* at 15 (citing Ex. 2016 ¶¶ 27–28).

Patent Owner's arguments are unavailing. We determine that Petitioner has adequately explained that one of ordinary skill in the art would understand that Sen could be modified to permit only the sending of control packets while in its Packet Standby state 44. Remand Br. 10–13;

Remand Reply 2–4. Specifically, Petitioner has explained that while Sen is in the Packet Standby state 44, a mobile station can transmit *either* data packets or control packets via the reduced portion of the bandwidth." Remand Reply 2 (citing Ex. 1023, 2:1–3, 5:37–38; Ex. 1050 ¶¶ 12–13); *see also* Remand Resp. 2–3. Petitioner further provided a reasoned explanation for why an ordinarily skilled artisan would have been motivated to modify Sen only to permit sending control messages (as opposed to data packets) upstream, namely, to maximize the amount of available bandwidth for mobile stations in the Packet Transfer state by "reducing the bandwidth available in the packet standby state to an amount sufficient to send a control packet but less than necessary to send data packets." Remand Br. 12 (citing Ex. 1050 ¶¶ 25–26).

Patent Owner's arguments that the proposed modification would create a disadvantage or impair Sen's primary purpose are unpersuasive because they are materially inconsistent with Sen's disclosure. *See* Remand Resp. 13–15 (citing Ex. 2016 ¶ 27; Ex. 1023, 1:41–49, 4:67–5:3). Patent Owner argues that the modification would restrict the mobile station's ability to "immediately transmit data" when in its Packet Standby state 44. *Id*. at 14–15 (citing Ex. 1023, 1:41–49, 4:67–5:3). However, when Sen describes "being able" to "transmit data immediately," Sen refers to the transition back to a Packet Transfer state 42 from the Packet Standby state 44 without having to enter the contention phase that can introduce a time delay. Ex. 1023, 4:37–42, 4:62–67 ("when the base station receives a control packet requesting more bandwidth . . . the MS 26 can quickly revert (f) to the Packet Transfer state 42 when required without having to go through the MAC Contention state 40 again"). That is, Sen describes

sending either a data packet or a control packet to facilitate a fast switch from Packet Standby state 44 to Packet Transfer state 42 to "transmit data immediately." Ex. 1023, 4:47–5:3, 5:26–6:11, Figs. 4–6.

It follows then that if *either* a data packet or a control packet may be used to transmit data immediately after a fast switch from Packet Standby state 44 to Packet Transfer state 42, a modification to allow only control packets to be transmitted while in the Packet Standby state 44 would still provide the ability to "transmit data immediately." Remand Reply 5–6. Patent Owner's expert, Dr. Lomp, admitted as much, stating that Sen's use of a control packet during its Packet Standby state 44 would restore the bandwidth faster than using contention. Ex. 1052, 53:3–20. Sen expressly discloses that its technique of quickly switching back to the Packet Transfer State 42, which can be triggered by sending a control packet, "permits delay-sensitive, real-time GPRS traffic (e.g., VOIP) to be provided to user of the network 10." Ex. 1023, 5:1–3. Dr. Lomp identifies the same capability of avoiding the delay associated with having to restore bandwidth via contention is the "benefit of the '991 patent." *Id*. at 54:9–19. Hence, we agree with Petitioner that the proposed modification "provides immediate (contention-free) access to the original bandwidth" and thus would continue to achieve the purpose of the '991 patent of avoiding contention as identified by Dr. Lomp. Remand Reply 6.

For the reasons expressed above in connection with the grant pending absent state, we determine that Petitioner has established by a preponderance of evidence that Sen alone suggests that aspect of claim 1. We discern no reason to deviate from the determinations in our prior Decision that Sen describes the remaining limitations of claim 1. *See* Dec. 27–36. Because

Petitioner relied upon Rydnell and admitted prior art as alternative arguments (*See* Pet. 64, 67; PO Resp. 51–52) and because we conclude that Sen teaches or suggests every element of claim 1, we need not address Petitioner's alternative reliance upon Rydnell or admitted prior art.

4. Dependent Claims 3–5

Petitioner relies solely upon Sen as describing the limitations that are introduced in dependent claims 3–5. Pet. 69–70. In this remand, Patent Owner has not separately argued in favor of dependent claims 3–5. Applying the reasoning and analysis of dependent claims 3–5 in our prior Decision, which continues to apply to Petitioner's arguments for unpatentability, and based on our review of the record before us, we determine that Petitioner has established by a preponderance of evidence that Sen describes the limitations introduced in dependent claims 3–5. Dec. 36–37. Accordingly, we are persuaded that Sen renders the dependent claims unpatentable.

5. Conclusion

Based on a preponderance of the evidence before us, we conclude that Petitioner has established that Sen alone renders claims 1 and 3–5 unpatentable as obvious.

III. CONCLUSION

In summary,

Claim(s)	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 3–5	103	Sen	1, 3–5	
1, 3–5	103	Sen, APA, Rydnell		
		Overall Outcome	1, 3–5	

IV. ORDER

For the reasons given, it is:

ORDERED that claims 1 and 3–5 of U.S. Patent 8,274,991 B2 are held to be *unpatentable* as obvious under 35 U.S.C. § 103; 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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