

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION,
Petitioner,

v.

QUALCOMM, INC.,
Patent Owner.

Case IPR2018-01346
Patent 9,535,490 B2

Before DANIEL N. FISHMAN, DANIEL J. GALLIGAN, and
AARON W. MOORE, *Administrative Patent Judges*.

FISHMAN, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Intel Corporation (“Petitioner”) requests *inter partes* review of claims 9, 11–13, 26, and 27 (the “challenged claims”) of U.S. Patent No. 9,535,490 B2 (“the ’490 patent,” Ex. 1401) pursuant to 35 U.S.C. §§ 311 *et seq.* Paper 3 (“Petition” or “Pet.”). Qualcomm Incorporated (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”).

Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). Upon consideration of the Petition and Patent Owner’s Preliminary Response, we conclude the information presented shows there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one challenged claim of the ’490 patent. Therefore, we institute review of all challenged claims and all asserted grounds.

A. *Real Parties-In-Interest and Related Matters*

Apple Inc. is identified as an additional real party-in-interest. Pet. 1. The parties inform us that the ’490 patent is presently asserted against Petitioner in the litigation *Qualcomm Inc. v. Apple Inc.*, Case No. 3:17-cv-01375-DMS-MDD (S.D. Cal.), and against Apple in a proceeding before the International Trade Commission (“ITC”) captioned *In the Matter of Certain Mobile Electronic Devices and Radio Frequency Components Thereof*, Inv. No. 337-TA-1065. Pet. 1–2; Paper 4, 2. The parties further inform us that the ’490 patent is at issue in *inter partes* review Cases IPR2018-01261, IPR2018-01293, IPR2018-01295, and IPR2018-01344. Pet. 2; Paper 4, 2.

B. The '490 Patent

The '490 patent is generally directed to power saving techniques in computing devices. Ex. 1401, Title (54), Abstract (57). According to the '490 patent, although stationary desktop computers and servers are generally immune to power consumption issues, “mobile devices constantly struggle to find a proper balance between available functions and battery life.” *Id.* at 1:28–31. The '490 patent further indicates that mobile devices utilize internal bus structures to connect components within the mobile device and that increased performance demands have led to use of faster, higher-power-consuming interconnect bus structures within mobile devices (e.g., Peripheral Component Interconnect Express “PCIe” and Universal Serial Bus “USB” 3.0). *Id.* at 1:36–60.

Figure 1C of the '490 patent is reproduced below.

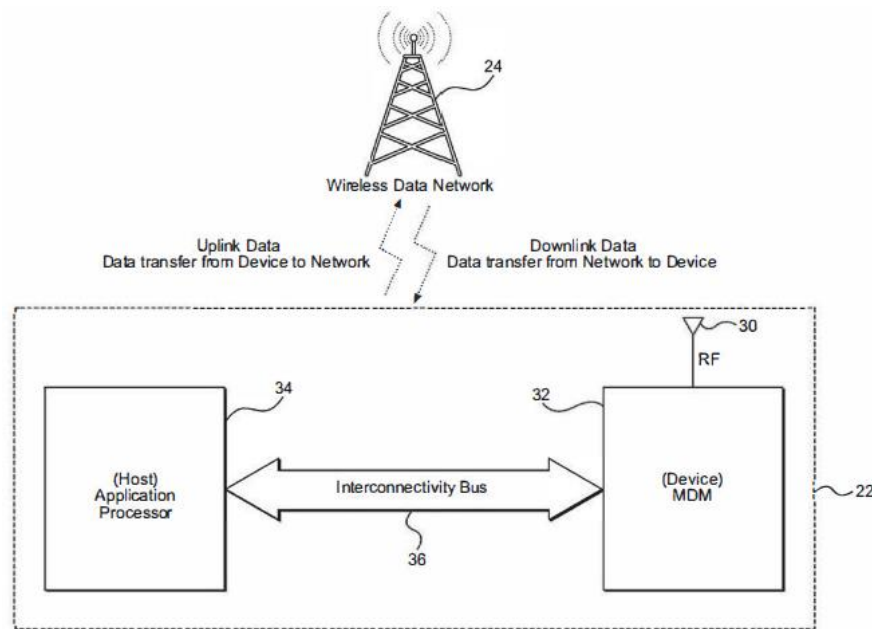


FIG. 1C

Figure 1C is a block diagram of mobile terminal 22 with interconnectivity bus 36 coupling application processor 34 and modem

processor 32. In one embodiment disclosed by the '490 patent, bus 36 may be a PCIe bus. *Id.* at 8:6–9. According to the '490 patent, “[w]hile placing the interconnectivity bus 36 in a sleep mode generally saves power, such sleep modes do have a drawback in that they consume relatively large amounts of power as they transition out of the sleep mode.” *Id.* at 8:9–12.

According to the '490 patent, the PCIe bus can be transitioned from a low power state (e.g., saving battery life) to an active state in which information may be exchanged. *Id.* at 8:23–26. Figure 3 of the '490 patent is reproduced below.

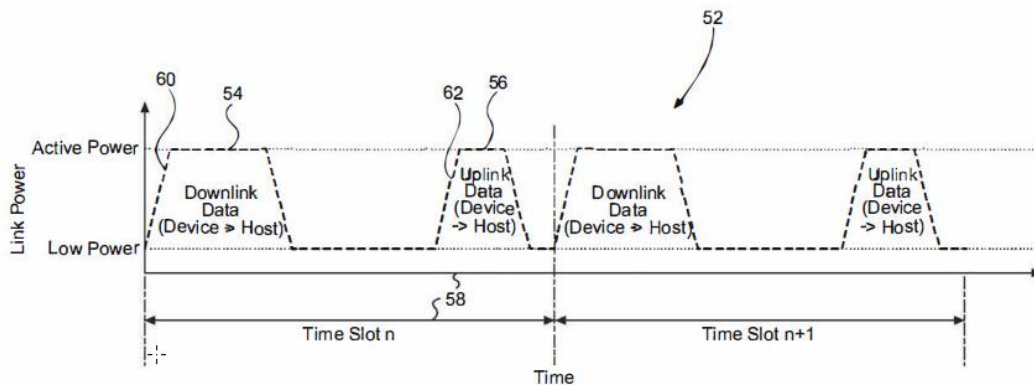


FIG. 3

Figure 3 depicts graph 52, without the purported improvement of the '490 patent, presenting time on the X-axis versus the power state of a PCIe link on the Y-axis. Time is shown as a sequence of time slots 58 (n, n+1, etc.). *Id.* at 8:20. The '490 patent asserts that, within a given time slot 58, exchange of downlink data 54 requires first transition 60 from a low power state to an active power state and back to a low power state, followed by a similar second transition 62 for exchange of uplink data 54. *Id.* at 8:21–34. According to the '490 patent, where the time slot duration is one millisecond, as is common, there may be thousands of such transitions (60,

62) per second. *Id.* at 8:34–38. Thousands of such transitions per second consume a significant amount of power in a battery powered mobile terminal. *Id.* at 8:38–40.

The '490 patent purports to improve battery life by reducing the number of such transitions. Figure 5 of the '490 patent is reproduced below.

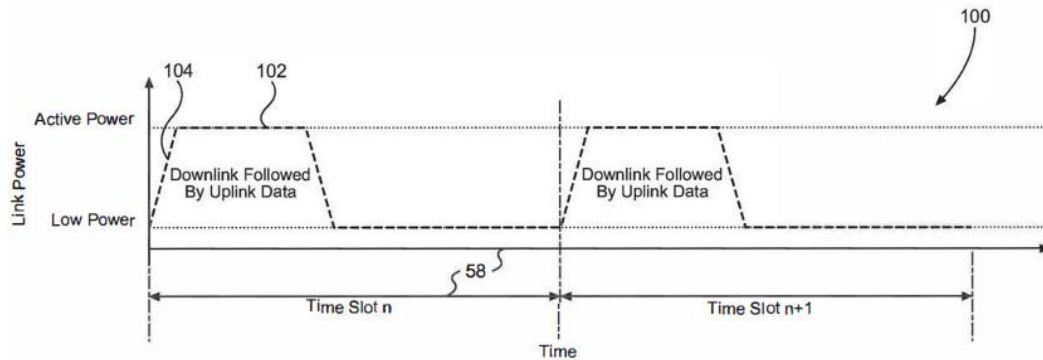


FIG. 5

Figure 5 depicts graph 100, as improved by the purported invention of the '490 patent, presenting time on the X-axis versus the power state of a PCIe link on the Y-axis. According to the '490 patent, combining transmission of downlink data and uplink data during a single active power state period 102 requires only one transition 104 from a low power state to an active power state during a time slot 58. *Id.* at 10:36–40. According to the '490 patent, reducing the number of transitions increases the duration of the low power state in each time slot, thus conserving battery power in a mobile terminal. *Id.* at 10:40–45.

The '490 patent proposes a number of structures and techniques within a mobile terminal for combining uplink and downlink transmissions to reduce the number of low power to active power transitions.

Figure 2 of the '490 patent is reproduced below.

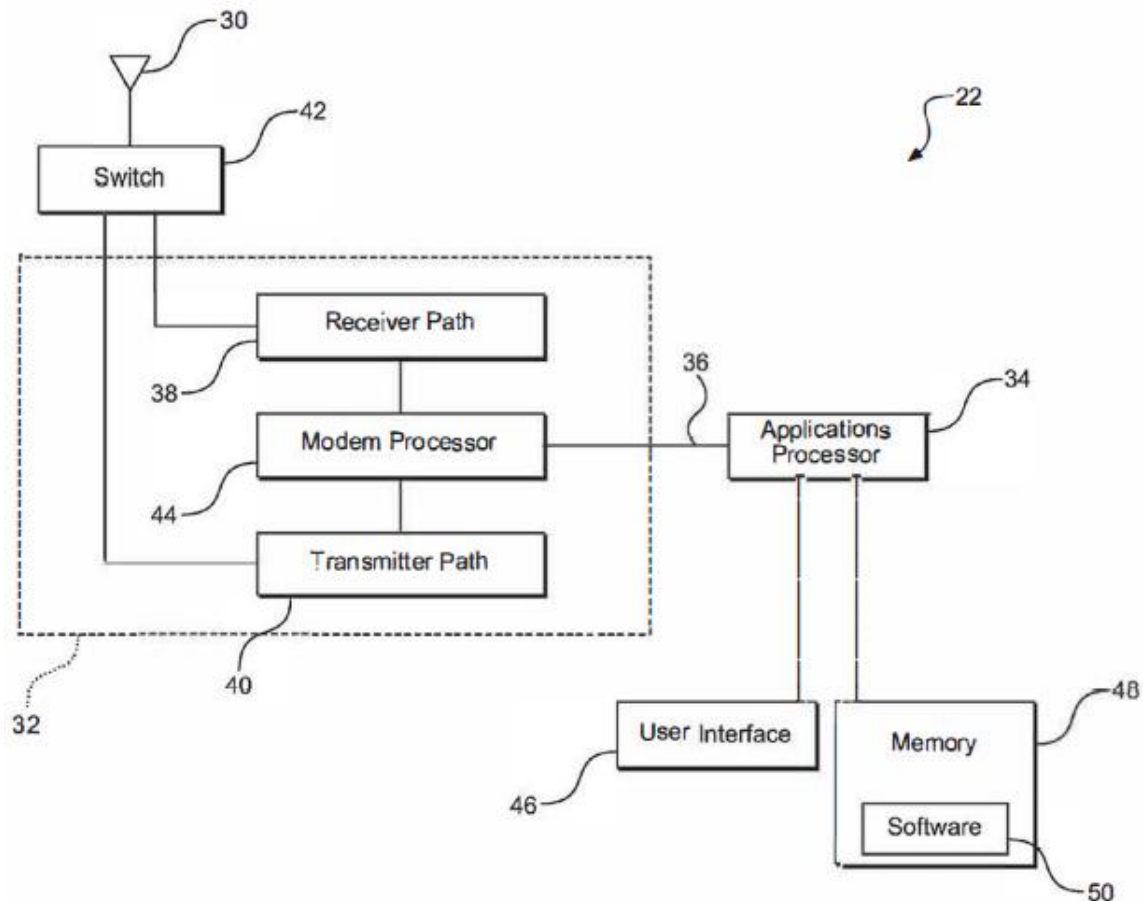


FIG. 2

Figure 2 is a block diagram of exemplary mobile terminal 22. Mobile terminal 22 comprises application processor 34 and modem 32. Ex. 1401, 6:58–63. Modem 32 further comprises modem processor 44, receiver path 38, and transmitter path 40. *Id.* at 6:58–63. Modem processor 44 and application processor 34 are coupled by interconnectivity bus 36. *Id.* In one embodiment, bus 36 may be a PCIe compliant bus. *Id.* at 6:66–67. Mobile terminal 22 further comprises a modem timer (not shown). *Id.* at 4:30–31.

In one disclosed embodiment of the '490 patent, the modem processor is configured to hold data it has received that is ready to send to the application processor (“downlink” data) until a programmed time period of

the modem timer expires. *Id.* at 2:50–52. The application processor is configured to hold data it has ready to send to the modem processor (“uplink” data) until downlink data is received at the application processor from the modem processor, which triggers the application processor to send its held data to the modem processor. *Id.* at 2:56–62. In other disclosed embodiments of the ’490 patent, a variety of threshold measures may be used to override the wait for a timer to expire including, for example, a byte count limit, a packet size counter, a packet number counter, etc. *Id.* at 2:23–34.

C. Illustrative Claim

Challenged claims 9 and 11–13 depend from claim 1. Although claim 1 is not one of the challenged claims in this Petition, independent apparatus claim 1, reproduced below, is illustrative of the challenged claims:

1. A mobile terminal comprising:
 - a modem timer;
 - a modem processor, the modem processor configured to hold modem processor to application processor data until expiration of the modem timer;
 - an application processor;
 - an interconnectivity bus communicatively coupling the application processor to the modem processor; and
 - the application processor configured to hold application processor to modem processor data until triggered by receipt of the modem processor to application processor data from the modem processor through the interconnectivity bus after which the application processor to modem processor data is sent to the modem processor through the interconnectivity bus responsive to the receipt of the modem processor to application processor data from the modem processor through the interconnectivity bus.

Id. at 17:55–18:5.

D. Asserted Ground of Unpatentability

Petitioner asserts claims 9, 11–13, 26, and 27 are unpatentable under 35 U.S.C. § 103 as obvious over Heinrich¹ and Balasubramanian.² Pet. 4.

Petitioner relies on the testimony of Bill Lin, Ph.D. (Ex. 1402) in support of its assertions.

II. DISCUSSION

A. General Principles

1. Obviousness

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are “such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations.³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

¹ Heinrich et al., U.S. Patent No. 9,329,671 B2 (Ex. 1404, “Heinrich”).

² Balasubramanian, U.S. Patent No. 8,160,000 B2 (Ex. 1405).

³ Patent Owner does not present arguments or evidence of such secondary considerations in its Preliminary Response. Therefore, at this preliminary stage, secondary considerations do not constitute part of our analysis.

2. *Level of Ordinary Skill in the Art*

Petitioner argues a person of ordinary skill in the art related to the '490 patent would have a Master's degree in electrical engineering, computer engineering, or computer science, and would also have at least two years of experience in "mobile device architecture and multiprocessor systems." Pet. 19. In the alternative, Petitioner argues the ordinarily skilled artisan would have a Bachelor's degree in one of the above-identified programs and at least four years of experience in the above-identified fields. *Id.*

Patent Owner agrees with Petitioner's definition of the level of skill. Prelim. Resp. 14.

On the record before us and for purposes of this preliminary decision, we are persuaded by Petitioner's definition of the level of ordinary skill in the art, with the exception of the language "at least," and we find this definition is commensurate with the level of ordinary skill in the art as reflected in the prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) ("[T]he absence of specific findings on the level of skill in the art does not give rise to reversible error where the prior art itself reflects an appropriate level and a need for testimony is not shown.") (internal quotation marks omitted); *see also In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Here, we discern the prior art, as well as the '490 patent, require a degree of knowledge that is specific to "mobile device architecture and multiprocessor systems," as Petitioner has argued.

Accordingly, on this record and for purposes of this preliminary decision, we adopt Petitioner's definition of the level of ordinary skill in the art, with the exception of the language "at least," and determine that a person

of ordinary skill in the art at the time of the invention of the '490 patent would have had a Master's degree in electrical engineering, computer engineering, or computer science, and two years of experience in mobile device architecture and multiprocessor systems or, in the alternative, a Bachelor's degree in one of the above-identified programs and four years of experience in the above-identified fields.

B. Claim Construction

As a step in our analysis for determining whether to institute a review, we determine the meaning of the claims for purposes of this preliminary decision. In an *inter partes* review for a Petition filed before November 13, 2018, 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) (2017); *see also* *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142–46 (2016) (upholding the use of the broadest reasonable interpretation standard (“BRI standard”)). Under the broadest reasonable interpretation standard, claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). “[A] claim construction analysis must begin and remain centered on the claim language itself” *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004). “Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim.” *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004).

By contrast, for an expired patent or an unexpired patent challenged in a petition filed on or after November 13, 2018, we apply the principles set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc) (“*Phillips standard*”). See *Wasica Fin. GmbH v. Cont’l Auto. Sys., Inc.*, 853 F.3d 1272, 1279 (Fed. Cir. 2017); *Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 51,340, 51,340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner applies the *Phillips* standard for interpreting terms of the ’490 patent but argues “Petitioner is not aware of any difference in how the claims would be construed under the BRI standard.” Pet. 18–19. Patent Owner asserts that, under our rules, the BRI standard should be applied. Prelim. Resp. 14 (citing 37 C.F.R. § 42.100(b)).

We agree with Patent Owner and discern no reason that we would not apply the BRI standard here. On the record before us, the ’490 patent is not expired, the patent will not likely expire prior to any potential final written decision, neither party has made a request in compliance with our rules that

the *Phillips* standard be applied,⁴ and the Petition was filed prior to the change of our rules regarding claim construction effective for petitions filed on or after November 13, 2018. Therefore, for purposes of this preliminary decision, we apply the broadest reasonable interpretation for any needed claim construction.

Furthermore, only terms that are in controversy need to be construed and only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))). Petitioner proposes a construction of the term “triggered by” as it appears in claim 1. Pet. 19–20. Patent Owner contends no terms require construction “at this stage in the proceeding.” Prelim. Resp. 14.

Other than the term identified below, we discern no reason on this preliminary record and for this preliminary decision to construe any other claim terms.

“Triggered By”

Each of claim 1, from which challenged claims 9 and 11–13 depend, and independent claims 26 and 27 includes a recitation in which the application processor is configured to hold data destined to the modem

⁴ The applicable version of 37 C.F.R. § 42.100(b) requires that a request to apply the *Phillips* standard “must be made in the form of a motion under § 42.20, within 30 days from the filing of the petition.” Petitioner’s suggestion that the *Phillips* standard be applied is not compliant with this rule.

processor until *triggered by* receipt of data from the modem processor. Petitioner argues the term “triggered by” means “initiated in response to.” Pet. 19. Petitioner argues the ’490 patent Specification does not expressly define the term but the Specification, prosecution history, and the claims impliedly support its proffered construction. Pet. 19–20 (citing Ex. 1401, 2:3–6, 11:15–18, 11:39–46; Ex. 1403, 14⁵). Petitioner further cites to extrinsic evidence (three dictionaries defining “trigger”) in support of its proffered construction of *triggered by*. Pet. 20 (citing Exs. 1412, 1413, 1414).

As noted above, Patent Owner does not specifically address construction of this or any other claim terms but, instead, argues no claim construction is necessary at this stage of the proceeding. Prelim. Resp. 14.

We find Petitioner’s proffered construction of *triggered by* is persuasive. Specifically, claim 1 sufficiently defines the condition that *triggers* the defined response—i.e., data is held by a first processor until receipt of data from a second processor after which the first processor sends its held data to the second processor. The receipt of data is the event that

⁵ Petitioner cites, “See Ex-1403 [8/24/2016 Response], 14” referring to page 14 of the identified document from a plurality of documents merged into Exhibit 1403 as originally numbered. Exhibit 1403 is properly annotated by Petitioner with sequential page numbers as required by our rules. We identified the cited quotation on page number 45 of the properly annotated Exhibit. Petitioner repeats this citation method in various citations to exhibits (e.g., exhibits 1412, 1413, 1414). For further filings, we request both parties annotate non-patent literature exhibits with sequential page numbers (e.g., so-called Bates numbers) and cite to the annotated sequential page numbers rather than the original page numbering of the document.

triggers further action (transmission of the held data from the first processor to the second processor) following the event.

Therefore, for purposes of this preliminary decision, we adopt the definition proffered by Petitioner and find that “triggered by” some condition means “initiated in response to” the condition.

C. Section 314(a) Discretion

Patent Owner argues we should exercise our discretion to deny this Petition under 35 U.S.C. § 314(a) for two reasons: (1) the late stage of related litigation proceedings and (2) the filing of multiple petitions challenging the ’490 patent. Prelim Resp. 15–23. Petitioner does not address this discretionary denial issue in its Petition. We address Patent Owner’s arguments below.

1. Late Stage of Related Litigations

Patent Owner argues we should exercise our discretion under Section 314(a) to deny this Petition in view of the late stage of parallel proceedings in the ITC and the U.S. District Court for the Southern District of California (“SDCA”). Prelim. Resp. 15–20. More specifically, Patent Owner argues the ITC and SDCA proceedings are both in late stages and, although not addressing these challenged claims, the ITC and SDCA proceedings address “the same underlying issues” by addressing similar limitations in claim 31 and addressing the same combination (Heinrich and Balasubramanian) as applied to claim 31. Prelim. Resp. 17–18. Patent Owner further argues that “by filing the Petition so late, Petitioner and Apple seek to re-litigate an issue that has already been fully litigated in a different forum and will be decided in *two* different forums well before the Board can reach a final

written decision.” *Id.* at 19. Patent Owner identifies three prior decisions of the Board as allegedly supporting its position urging discretionary denial of this Petition. *Id.* at 15–16 (citing *NetApp, Inc. v. Realtime Data LLC*, Case IPR2017-01195 (PTAB Oct. 12, 2017) (Paper 9) (“*NetApp*”); *Nautilus Hyosung, Inc. v. Diebold, Inc.*, Case IPR2017-00426 (PTAB June 22, 2017) (Paper 17) (“*Nautilus*”); and *NHK Spring Co. v. Intri-Plex Tech., Inc.*, Case IPR2018-00752 (PTAB Sept. 12, 2018) (Paper 8) (“*NHK*”)).

We are not persuaded by Patent Owner’s arguments that we should exercise our discretion to deny. We find these cases to be distinguishable. For example, in *NetApp* and *Nautilus*, the exercise of discretion to deny institution was based primarily on the filing of an earlier petition before the Board (by the same or a related party). *See Nautilus* at 12–16; *NetApp* at 10–13. Here, Petitioner has not filed an earlier petition directed to these challenged claims.⁶ *NHK* addresses a fact pattern more similar to the facts here. However, *NHK* is distinguishable in that the patent at issue had expired and, thus, the panel there applied the same claim construction standard as the court in the parallel District Court litigation—i.e., the *Phillips* standard. Here, as discussed above, we apply the BRI standard for claim construction.

In addition, the Board’s decision whether to exercise discretion to deny institution under § 314(a) is “part of a balanced assessment of all relevant circumstances in the case, including the merits.” *See Office Patent*

⁶ We address below the fact that Petitioner has filed other petitions directed to other claims of the ’490 patent—filed substantially concurrently with this Petition.

Trial Practice Guide Update⁷ referenced at 83 Fed. Reg. 39,989 (Aug. 13, 2018) at 10–11. Here, as discussed below, we have considered the merits of Petitioner’s contentions regarding the combination of Heinrich and Balasubramanian, and we determine Petitioner has met its burden to show a reasonable likelihood that the references pertain to the same field of use and has articulated a rational basis for combining the references. In contrast, the ALJ’s initial determination that “[i]t has not been shown by clear and convincing evidence that [claim 31] is invalid” (*see* Ex. 2006, 2), is not only based on a higher burden of proof than here, but is now being reviewed by the Commission and may be overturned in a final decision.⁸ *See* Ex. 3001 (Commission Review of Initial Determination in Inv. No. 337-TA-1065). In sum, we are not persuaded that the parallel litigations in the ITC and the SDCA will necessarily address the same issues, based on the same claim constructions, same standards of proof, and same evidence, and at least the ITC determination is under review. Therefore, we decline to exercise our discretion under 35 U.S.C. § 314(a) to deny this Petition based on the status of parallel litigations.

⁷ Available at <https://go.usa.gov/xU7GP>.

⁸ We also point out that only claim 31 is challenged at the ITC. Thus, the ITC will not dispose of all the issues in the related IPRs, which are directed to separate claims of the ’490 patent. The evidence and argument is nearly the same across all proceedings. If we are to give Petitioner a first chance at challenging these claims, the panel would nonetheless need to perform nearly the same analysis in related proceedings, regardless of whether it exercised discretion to deny institution in this proceeding.

2. *Multiple Petitions*

Noting that Petitioner has filed five petitions (including the present Petition) all addressing claims of the '490 patent, Patent Owner argues that such duplication is abusive and wasteful of resources of both the Board and Patent Owner, and, therefore, argues we should exercise our discretion to deny this Petition under 35 U.S.C. § 314(a). Prelim. Resp. 20–23. Patent Owner argues that, because our procedures require instituting on all claims and grounds asserted in a petition or not instituting on any claims and grounds, Petitioner has divided its grounds and claims into five petitions so that potentially weaker arguments for some claims and/or grounds do not cause us to deny institution for all claims and grounds. *Id.* at 21. Patent Owner asserts that “Petitioner has divided its challenges to the '490 patent claims that would normally fit into one petition (*i.e.*, two grounds challenging 22 claims) across *five* petitions, hoping to increase its odds of institution.” *Id.*

We are not persuaded by Patent Owner’s argument that we should exercise our discretion under section 314(a) to deny this Petition in view of Petitioner’s strategy to file multiple petitions.

Although, in view of SAS,⁹ the Board exercises its discretion for *each* petition to institute all claims and grounds or no claims and grounds, Patent Owner’s assertion that splitting the claims and grounds into five petitions when one would suffice is inapposite. This practice is not necessarily improper (*see Rules of Practice for Trials Before the Patent Trial and*

⁹ The Supreme Court held that a decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018) (“SAS”).

Appeal Board and Judicial Review of Patent Trial and Appeal Board Decisions; Final Rule, 77 Fed. Reg. 48,612, 48,635 (Aug. 14, 2012) (response to Comment 91, explaining that filing multiple petitions is an alternative to requesting a waiver of page, now word, counts)). For example, there may be appropriate reasons for Petitioner to divide the claims and grounds into multiple petitions, such as to logically separate different claim sets for purposes of analysis and to avoid subjecting all claims to the all or nothing decision required by SAS. The SAS decision does not preclude this practice.

Furthermore, the five petitions were all filed within a few days of one another.¹⁰ The five petitions challenge non-overlapping subsets of the claims of the '490 patent. On this record, we discern no prejudice to Patent Owner in Petitioner's filing strategy regarding the five petitions directed to the '490 patent. Petitioner did not wait to review Patent Owner's Preliminary Response or our institution decision in one case before filing a next petition. Under the circumstances of this case, Petitioner's decision to file multiple petitions does not warrant the exercise of our discretion to deny institution.

3. Conclusion Regarding Discretion Under Section 314(a)

For the above reasons, on the record before us, we decline to exercise our discretion to deny this Petition under 35 U.S.C. § 314(a).

¹⁰ This case, IPR2018-01346, was filed July 6, 2018, IPR2018-01261 was filed June 29, 2018, IPR2018-01293 was filed June 29, 2018, IPR2018-01295 was filed June 29, 2018, and IPR2018-01344 was filed July 6, 2018.

D. Cited Prior Art References

1. Overview of Heinrich (Ex. 1404)

Heinrich is directed to problems of power efficiency in inter-processor communications (“IPC”) among multiple processors of a system. Ex. 1404, 1:6–2:8. In battery-powered systems in particular, power consumption is a critical issue. *Id.* at 1:18–23. Figure 1 of Heinrich is reproduced below.

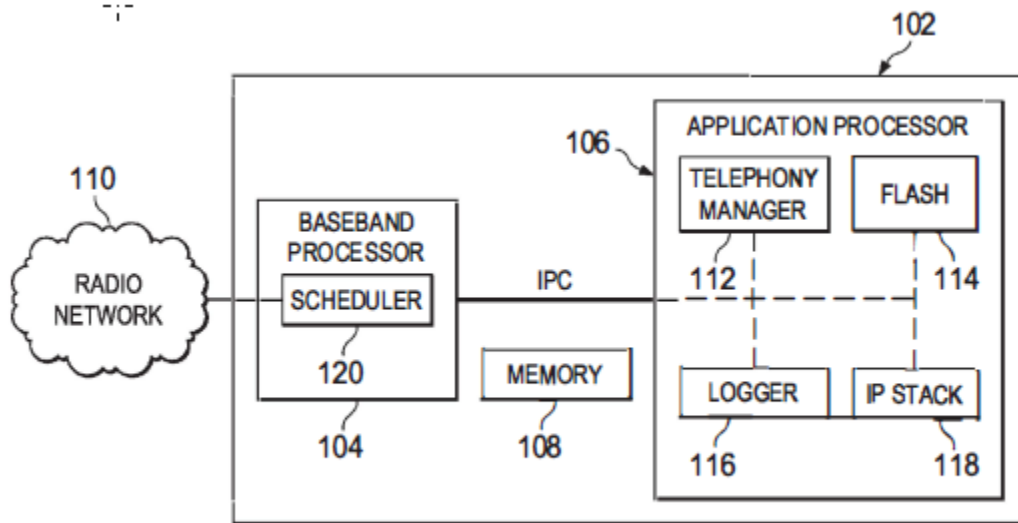


FIG. 1

Heinrich’s Figure 1 is a schematic illustration of a communication system including mobile device 102. *Id.* at 3:19–20, 4:18–19. Mobile device 102 may be a mobile phone or tablet connected to radio network 110. *Id.* at 4:19–21. Mobile device 102 comprises baseband processor 104 and application processor 106. *Id.* at 4:26–29. Baseband processor 104 acts as a radio frequency (“RF”) modem to modulate and demodulate data exchanged between mobile device 102 and network 110. *Id.* at 4:30–33. Physical interface (labeled IPC in Figure 1) communicatively couples baseband processor 104 and application processor 106. *Id.* at 4:44–46. The physical interface to the IPC may be, for example, a USB interface. *Id.* at 4:46–48.

Each processor of mobile device 102 may operate in one of a plurality of modes, including an “awake” mode ready to process data and a “sleep” mode not ready to process data but saving power. *Id.* at 1:54–62. According to Heinrich, in the prior art, each time baseband processor 104 receives any quantum of data to be sent to application processor 106, application processor 106 would have to already be in the awake mode or would have to be transitioned from the sleep mode to the awake mode. *Id.* at 1:65–2:2. Frequent transitions out of sleep mode consume additional power in mobile device 102. *Id.* at 2:2–8.

To reduce power consumption of mobile device 102, Heinrich discloses that baseband processor 104 includes scheduler 120. *Id.* at 7:8–10. Scheduler 120 may be configured to reduce power consumption by reducing the number of times a processor is awakened from its sleep mode. *Id.* at 7:16–19. Scheduler 120 may be configured to schedule communication in either direction between baseband processor 104 and application processor 106. *Id.* at 7:19–21. Alternatively, scheduler 120 may schedule only communication from baseband processor 104 to application processor 106, and another scheduler (not shown) implemented within application processor 106 may schedule communication in the opposite direction. *Id.* at 7:21–27. In general, scheduler 120 is operable to identify communications awaiting transmission from one processor to the other processor that are not real-time critical so that they may be delayed until a later time to avoid causing another sleep-to-awake mode transition of the other processor. *Id.* at 7:65–8:1. By grouping the non-real-time sensitive exchanges together and scheduling them for communicating to the other processor during a period in which the other processor is continuously in the awake mode, the number of

times that the other processor enters and exits the sleep mode is reduced. *Id.* at 4:6–11.

Heinrich's Figure 3 is reproduced below.

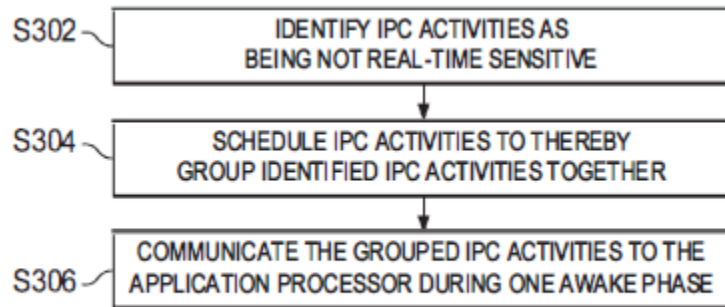


FIG. 3

Figure 3 is a flowchart describing operation of a scheduler. At step S302, scheduler 120 determines which pending communications awaiting transmission to the other processor are not real-time sensitive. *Id.* at 8:10–16. Non-real-time data is that which may be delayed, and, conversely, real-time data is that which must be transmitted without delay (e.g., voice communications). *Id.* at 8:14–20. Step S304 groups the identified non-real-time data for delayed transmissions and schedules them for transmission during a single awake mode of the other processor. *Id.* at 8:21–32. Step S306 transmits the grouped, delayed, non-real-time data to the other processor during a single awake mode—i.e., during a period of time in which the other processor is continuously awake. *Id.* at 8:33–49.

2. Overview of Balasubramanian (Ex. 1405)

Balasubramanian is directed to grouping packets of data to be exchanged by buffering packets destined for a device that is presently in a low power mode. Ex. 1405, 1:16–45. Balasubramanian's Figure 1 is reproduced below.

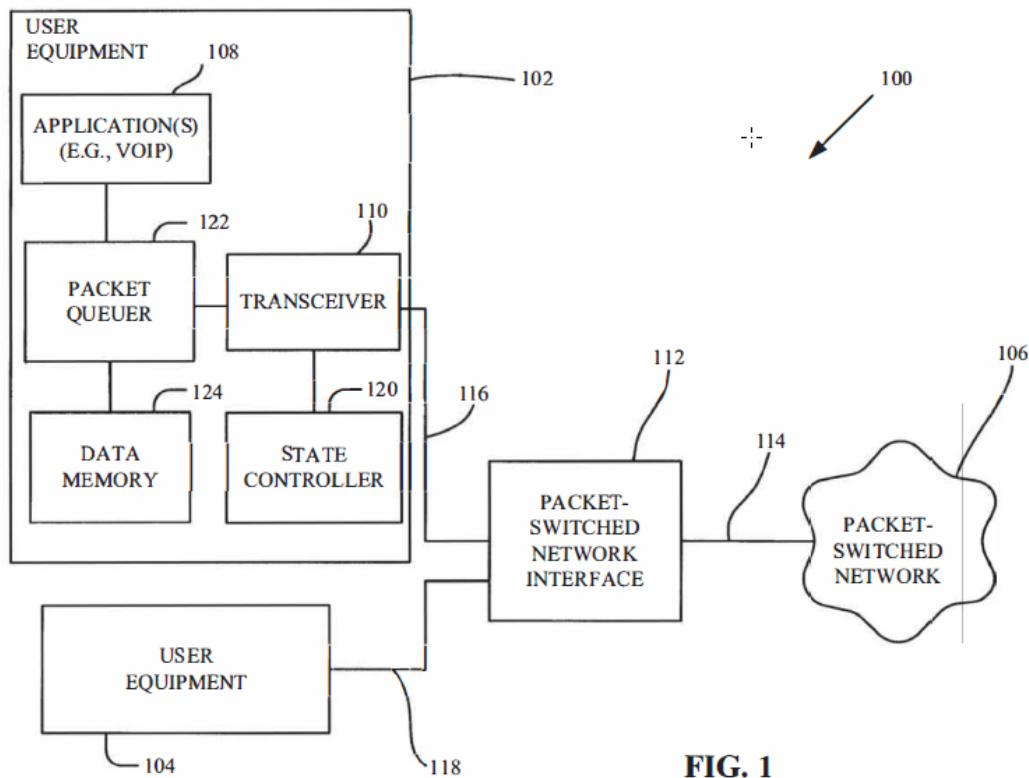


FIG. 1

Figure 1 depicts a system adapted to transmit and receive groups of packets. *Id.* at 3:15–17. System 100 includes user equipment 102 and 104 coupled to packet-switched network 106 to group packets for transmission and, thereby, reduce power consumption. *Id.* at 4:1–5. User equipment 102 and 104 may each be, for example, a mobile phone, a laptop computer, a wireless device or modem, or other types of communication devices wishing to connect with another user equipment or with packet-switched network 106. *Id.* at 4:24–29. User equipment 102 includes transceiver 110 to provide a physical layer interface for transmissions to and from user equipment 102. *Id.* at 4:37–42. User equipment 102 and 104 communicate with packet-switched network 106 through packet-switched network interface 112 (via communication links 116, 118, and 114). *Id.* at 4:43–57.

Transceiver 110 in user equipment 102 may be switched between an active state (ready to send or receive data) and a suspended state (saving

power but not ready to send or receive data). *Id.* at 5:30–46. To conserve power, while transceiver 110 is in a suspended state, user equipment 102 and interface 112 may queue packets to be sent through transceiver 110. *Id.* at 5:47–51.

Here, power may be conserved by not transitioning the transceiver **110** from the suspended state to the active state every time a packet has been generated for transmission by the user equipment **102** or every time it is expected that the user equipment **102** will receive a packet. Accordingly, power savings may be achieved by rescheduling the packet traffic into groups of traffic.

Id. at 5:55–61. To enable this power saving, “user equipment **102** and/or the network interface **112** may be adapted to queue packets while the transceiver **110** is in the suspended state.” *Id.* at 5:47–51.

Figure 2 of Balasubramanian is reproduced below.

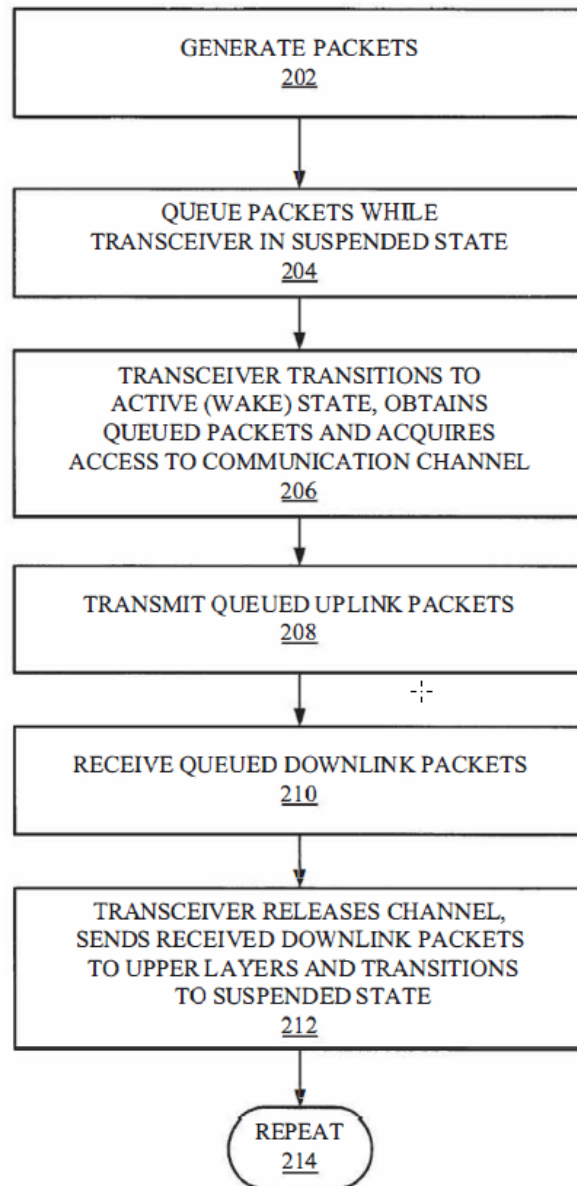


FIG. 2

Figure 2 is a flowchart of operations to send or receive a group of packets. *Id.* at 3:18–20. At step 202, user equipment 102 generates data as packets to be sent to packet-switched network 106. *Id.* at 6:29–31. At step 204, user equipment 102 queues the generated packets while transceiver 110 is in a suspended state. *Id.* at 6:40–43. At step 206, transceiver 110

awakens from its suspended state and obtains queued packets for transmission to packet-switched network 106. *Id.* at 6:55–62. At step 208, transceiver 110 transmits the queued packets over path 116—all queued packets may be retrieved and transmitted during the present single awake state of transceiver 110. *Id.* at 6:63–67. In addition, during the same single awake state at step 210, network interface 112 may “use the receipt of an uplink packet as a trigger to transmit any downlink packets in its queue” to transceiver 110. *Id.* at 7:4–8. Alternatively, transceiver 110 may send a message to interface 112 requesting transmission of any queued downlink packets up to transceiver 110. *Id.* at 7:8–13.

In some embodiments, Balasubramanian discloses a count of the number of queued packets may be compared to a threshold value to cause transition of a device to an active/awake state ready to transmit or receive packets. *See id.* at 6:55–58, 9:4–13.

E. Obviousness over Heinrich and Balasubramanian

Petitioner contends claims 9, 11–13, 26, and 27 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Heinrich and Balasubramanian. Pet. 27–69.

1. Motivation to Combine Heinrich and Balasubramanian

a. An Ordinarily Skilled Artisan Would Have Combined Heinrich and Balasubramanian

As discussed further below, Petitioner relies on Balasubramanian for its disclosure relating to triggering transmission of packets responsive to receipt of packets. Petitioner argues the ordinarily skilled artisan would have been motivated to combine Balasubramanian’s disclosed triggering of

data transmission with Heinrich's disclosed inter-processor communication scheduling for the following reasons.

i. Analogous Art

First, Petitioner argues Balasubramanian and Heinrich are in the same field of endeavor addressing the same issues of reducing power consumption when transitioning from low power to high power states. Pet. 49–50. In particular, Petitioner argues Heinrich and Balasubramanian disclose “similar architectures that include two processing nodes coupled by a bus, buffering data on both sides of the bus to allow for power savings states, and the use of a timer in one or both processing nodes to determine when to send queued data to the other processing node.” Pet. 49 (citing Ex. 1404, 4:6–11; Ex. 1405, 5:55–61; Ex. 1402 ¶ 104). Second, Petitioner argues both references “solve the power consumption problem in the same way: minimizing the number of transitions from low power-to-high power states.” Pet. 49–50 (citing Ex. 1402 ¶ 105).

Patent Owner argues Petitioner's analysis depends on an overly broad characterization of the field of endeavor of Balasubramanian because the claims of the '490 patent are directed to a mobile terminal comprising multiple processors but Petitioner broadens that field to encompass Balasubramanian's two *separate* processing nodes coupled by a network. Prelim. Resp. 32–33. Patent Owner further argues the problem addressed in both Heinrich and Balasubramanian is reducing power consumption of processors rather than reducing power consumption of an interconnectivity bus between processors. Pet. 34.

Patent Owner notes that Administrative Law Judge Pender in the related ITC proceeding issued an Initial Determination that agrees with

Patent Owner that the references are non-analogous art. *Id.* at 34–36 (citing Ex. 2006, 92–94¹¹). Patent Owner argues that Judge Pender finds (based on testimony of Dr. Baker, apparently an expert witness for Patent Owner in the ITC proceeding), Heinrich and Balasubramanian cannot be combined because: (1) they are in different fields of endeavor, (2) they do not address any problem pertinent to the '490 claims, and (3) Heinrich's results alone (without adding Balasubramanian) are "outstanding." *Id.* (citing Ex. 2006, 92–94).

As an initial matter, as noted above, the ALJ's findings and conclusions are under review by the Commission. We have reviewed the merits of Petitioner's arguments and find them persuasive at this stage of the proceeding.

Whether a reference in the prior art is "analogous" is a factual question. *In re Clay*, 966 F.2d 656, 658–659 (Fed. Cir. 1992) (citing *Panduit Corp. v. Dennison Mfg.*, 810 F.2d 1561, 1568 n.9 (Fed. Cir. 1987), *cert. denied*, 481 U.S. 1052 (1987)). Two criteria have evolved for determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which

¹¹ Patent Owner cites to page numbers 92–94 of the underlying document of Exhibit 2006—pages 7–9 of the Exhibit as filed in this proceeding. As noted earlier regarding Petitioner's citations to exhibits, our rules require sequential page numbers be added to exhibits (e.g., so-called "Bates numbers"). For further filings, both parties are requested to comply with our rules regarding formatting of exhibits and are requested to cite to the added sequential page numbers.

the inventor is involved. *Id.* (citing *In re Deminski*, 796 F.2d 436, 442 (Fed. Cir. 1986); *In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979)).

Initially, to the extent Judge Pender’s decisions were based on Dr. Baker’s testimony before the ITC suggesting lack of motivation to combine the references, Dr. Baker’s testimony is not in the record before us in this preliminary proceeding. Furthermore, the findings of Judge Pender in the ITC proceeding are based on a higher level of proof (clear and convincing) than the level of proof required for this preliminary decision (reasonable likelihood). In addition, although we have considered Judge Pender’s decision, the decisions before the ITC are not binding on the Board.

On the record before us and for purposes of this preliminary decision, we are persuaded that Heinrich and Balasubramanian are in the same field of endeavor as the ’490 patent. Initially, we observe the ’490 patent broadly characterizes its field of endeavor as “power saving techniques in computing devices.” Ex. 1401, 1:20–21. Heinrich appears on its face to be in the same field in that it is directed to saving power in a computing system. *See, e.g.*, Ex. 1404, Title (54) (“POWER-EFFICIENT INTER PROCESSOR COMMUNICATION SCHEDULING”), 1:16–17 (“it is important to keep the power consumption of the computer system at a low level”). In like manner, Balasubramanian appears on its face to be in the same field. *See, e.g.*, Ex. 1405, Title (54) (“ACHIEVING POWER SAVINGS THROUGH PACKET GROUPING”), Abstract (57) (“Power savings may be achieved in a packet-switched system by grouping packets.”), 1:52–53 (“In some aspects power savings are achieved in an apparatus by grouping packets.”).

Thus, on this record and for purposes of this preliminary decision, we find Heinrich and Balasubramanian are in the same field of endeavor as the '490 patent—namely, power saving techniques in computing devices.

Furthermore, on the record before us for purposes of this preliminary decision, we are persuaded both Heinrich and Balasubramanian address a problem reasonably pertinent to the particular problem addressed in the '490 patent. Patent Owner narrowly identifies the problem addressed in the '490 patent as reducing power consumption *of an interconnectivity bus* between processors. We understand the problem addressed by the '490 patent more broadly as reducing power consumption *of a computing device*. See, e.g., Ex. 1401, 1:1:20–21 (“[t]he technology of the disclosure relates generally to power saving techniques in computing devices”). The '490 patent addresses this problem by synchronizing transmissions in both directions between processors, thereby reducing the number of low to high (active) power state transitions of an interconnectivity bus between processors. See, e.g., *id.* at 2:12–15 (“By holding or accumulating the data at a source processor in this fashion, unnecessary transitions between low power states and active states on the PCIe bus are reduced and power is conserved.”), 5:33–35 (“By holding or accumulating the data at a source processor in this fashion, unnecessary transitions between low power states and active states on the PCIe bus are reduced and power is conserved.”), 8:41–48 (“[e]xemplary aspects of the present disclosure reduce the number of transitions (i.e., 60, 62) from low power to active power by synchronizing packet transmission from the modem processor 44 and the application processor 34”).

Heinrich resolves the same problem by holding data until a more opportune time to send data from one processor to another to eliminate some

low to high power transitions within the computing device. *See, e.g.*, Ex. 1404, 4:6–15 (“By grouping the non real-time sensitive IPC activities together and scheduling them for communicating to the second processor during a period in which the second processor is continuously in the first mode, the number of times that the second processor enters and exits the second mode (e.g. sleep mode) is reduced. This reduces the power consumed by the computer system in handling the IPC activities.”), 10:44–47 (“delaying some of the IPC activities to thereby group them together . . . results in fewer transitions between the sleep and awake modes on the application processor 106”). Balasubramanian also resolves the same problem by holding data until a more opportune time to send data from one processor to another to eliminate some low-to-high power transitions within the computing device. *See, e.g.*, Ex. 1405, 1:52–53 (“In some aspects power savings are achieved in an apparatus by grouping packets.”), 5:55–61 (“Here, power may be conserved by not transitioning the transceiver 110 from the suspended state to the active state every time a packet has been generated for transmission by the user equipment 102 or every time it is expected that the user equipment 102 will receive a packet. Accordingly, power savings may be achieved by rescheduling the packet traffic into groups of traffic.”), 14:56–59 (“By ‘waking’ less often to transmit and/or receive packets, the number of transitions between active and suspended states (e.g., turning the transceiver on and off) will be reduced.”).

On the record before us for this preliminary decision, we are persuaded by Petitioner’s arguments that Heinrich and Balasubramanian are analogous art to the ’490 patent. However, that finding alone is insufficient

to establish a reason why the ordinarily skilled artisan would have combined the references.

ii. Balasubramanian's Triggering Would Have Been an Obvious Modification to Heinrich's Scheduling

Petitioner argues Heinrich discloses a scheduler associated with its application processor that detects when the baseband (modem) processor and interface are in an active state and, thus, it would have been obvious that Heinrich's application processor "could detect that the IPC interface and baseband processor are in an active state due to the reception of data from the baseband processor, upon which the application processor would transmit its data to the baseband processor over the IPC interface." Pet. 50 (citing Ex. 1404, 9:50–62, 12:47–64). Petitioner then contends Balasubramanian discloses such a solution because "network interface 112 detects that the transceiver 110 is in an active state upon receiving data from the transceiver 110, which triggers the network interface 112 to transmit its held data to the transceiver 110 over the communication link 116." *Id.*; see also Pet. 41–42 (citing Ex. 1405, 6:63–7:8, Fig. 1).

Petitioner contends it would have been obvious to the ordinarily skilled artisan to combine the solution of Heinrich with the solution of Balasubramanian to "piggyback the transmission from the application processor back to the baseband processor during the same 'active' mode time period and right after data is sent from the baseband processor to the application processor, reducing the number of times the processor enters and exits the active mode." Pet. 51–52 (citing Ex. 1404, 4:6–11). Petitioner argues,

Such a combination would have entailed merely incorporating a known technique (using the receipt of data from a processor as a

way of determining that the other processor is awake) for a known purpose (to trigger a transmission to a processor upon receipt of data from the processor) with an expected result (fewer bus transitions between active mode and sleep mode).

Pet. 52 (citing Ex. 1402 ¶ 107).

Patent Owner does not discuss this aspect of Petitioner's proffered motivation to combine the references.

We are persuaded by Petitioner's arguments. Both Heinrich and Balasubramanian solve the power consumption problem by holding (grouping) data until detecting a more opportune time to send the data to reduce the number of low to high power transitions of their processors. *See, e.g.*, Ex. 1404, 9:50–62, 12:47–64; Ex. 1405, 6:63–7:8. In addition, Heinrich teaches that its buffering techniques may be used in either direction of communication. Ex. 1404, 12:52–55. Furthermore, Balasubramanian specifically recites using receipt of data from the other processor as a trigger for the receiving processor to transmit its data to the other processor. Ex. 1405, 7:6–8. Thus, we are persuaded the ordinarily skilled artisan would have considered the teachings of Balasubramanian as a further improvement to reduce the number of low to high power state transitions.

On the record before us for this preliminary decision, we are persuaded by Petitioner's arguments that the ordinarily skilled artisan would have been motivated to combine Balasubramanian's disclosure of triggering transmission of data to another processor in response to receiving data from that other processor with Heinrich's disclosures to achieve the benefits of Balasubramanian and thereby arrive at the claimed invention.

b. Reasonable Expectation of Success in the Combination

Petitioner argues the ordinarily skilled artisan would have had a reasonable expectation of success in combining Balasubramanian's triggering ("piggyback") technique with Heinrich. Pet. 52–55. Specifically, Petitioner argues Heinrich teaches one processor (e.g., its application processor) sends data to another processor (e.g., baseband (modem) processor) when triggered by receipt of any of a variety of notifications that the other processor is awake/active. Pet. 52–54 (citing Ex. 1404, 9:54–58, 10:1–6, 10:24–31). Petitioner then contends the ordinarily skilled artisan would have expected to successfully utilize another type of notification such as Balasubramanian's triggering of sending data in response to receipt of data from the other processor. Pet. 54–55 (citing Ex. 1402 ¶ 110).

Patent Owner does not discuss these assertions of Petitioner.

On the record before us for this preliminary decision, we are persuaded by Petitioner's arguments that the ordinarily skilled artisan would have had a reasonable expectation of success in combining Balasubramanian's disclosure of triggering data transmission in response to receipt of data with Heinrich's disclosures of sending data from one processor to another in response to any of a variety of notifications (triggers) and thereby arrive at the claimed invention.

*c. Preliminary Determination Regarding Motivation
To Combine Heinrich and Balasubramanian*

On the record before us, for purposes of this preliminary decision, and for the reasons discussed above, we are persuaded the Petition has sufficiently articulated reasons the ordinarily skilled artisan would have been

motivated to combine the references based on rational underpinnings and having a reasonable expectation of success.

2. Dependent Claim 9 and Independent Claim 1

For the reasons discussed below, we are persuaded that the Petition has established a reasonable likelihood of prevailing in showing that dependent claim 9 is unpatentable over the combined teachings of Heinrich and Balasubramanian.

Petitioner acknowledges that independent claim 1 is not challenged in this Petition but correctly observes that challenged claim 9 depends from claim 1. Pet. 27. Thus, in addressing claim 9, Petitioner first addresses elements of claim 1 from which claim 9 depends. Pet. 28–48.

Petitioner argues Heinrich teaches or suggests limitations of claim 1 including “the application processor configured to hold application processor to modem processor data” but relies on Balasubramanian, in the proposed combination, to teach or suggest “until triggered by receipt of the modem processor to application processor data from the modem processor through the interconnectivity bus.” *Id.* Specifically, referring to an earlier argument regarding the modem processor holding data destined for the application processor, Petitioner argues Heinrich teaches or suggests that both application processor and the baseband (modem) processor store data destined for the other processor prior to sending that data over its inter-processor bus. Pet. 36–37 (citing Pet. 30–33; Ex. 1404, 12:52–55; Ex. 1402 ¶ 87).

Regarding the further recitation that the data is held “until triggered by receipt of the modem processor to application processor data from the modem processor through the interconnectivity bus,” Petitioner argues,

Heinrich teaches or suggests the application processor holds data until it determines that the baseband (modem) processor is in an awake state such that it can receive data transmitted from the application processor. Pet. 38 (citing Ex. 1404, 9:22–26). Petitioner further argues Heinrich discloses other conditions one processor may detect to determine that the other processor is in an awake state ready to receive data. Pet. 38–39.

Petitioner acknowledges that Heinrich does not expressly disclose the application processor holding data destined for the baseband processor until triggered by receipt of data from the baseband processor but relies on Balasubramanian for teaching or suggesting that a processor sends data destined to another processor in response to (triggered by) receipt of data from the other processor. Pet. 39–42. Therefore, Petitioner contends the combination of Heinrich and Balasubramanian teaches or suggests the application processor holding data destined to the baseband (modem) processor “until triggered by receipt of the modem processor to application processor data from the modem processor through the interconnectivity bus.” Pet. 43.

First, Patent Owner argues, in the ITC proceeding, “ALJ Pender found ‘Balasubramanian is not directed to inter-processor communications within a mobile device terminal and thus, Balasubramanian does not disclose any of the claim 31 limitations.’” Prelim. Resp. 37 (quoting Ex. 2006, 90). Patent Owner acknowledges that Judge Pender addressed elements of claim 31 but argues “the analysis applies equally to claims 1, 26, and 27” at issue here. *Id.* In other words, based on Judge Pender’s findings, Patent Owner substantially repeats its earlier argument that Balasubramanian is non-analogous art. For the reasons discussed *supra*, we are persuaded that

Balasubramanian, as well as Heinrich, are analogous art to the '490 patent—they are all in the same field of endeavor and both Heinrich and Balasubramanian are directed to a problem reasonably pertinent to that of the '490 patent.

Second, Patent Owner argues Balasubramanian discloses only that network processor 112 holds data destined to transceiver 110 (*downlink* data) until receipt of data from transceiver 110 (*uplink* data) triggers network interface 112 to transmit all queued packets (*downlink* data). Prelim. Resp. 37–38 (citing Ex. 1405, 7:4–11). Patent Owner contends this is the opposite of claim 1, which requires the receipt of *downlink* data to trigger the transmission of *uplink* data. *Id.*

Lastly, incorporating its earlier arguments, Patent Owner argues Heinrich does not remedy the deficiency of Balasubramanian because “Heinrich does not disclose synchronizing data transmissions in two directions across an IPC bus.” *Id.* at 39 (quoting Ex. 2006, 89).

We disagree with Patent Owner. As discussed above, Petitioner relies on Heinrich in the proposed combination for teaching or suggesting that each processor may hold data destined to the other processor until it detects that the other processor is ready to receive the held data. Pet. 40 (citing Ex. 1404, 12:52–55; Ex. 1402 ¶ 89). Both parties cite portions of the same paragraph of Heinrich (Ex. 1404, 12:47–64) in support of their characterization of Heinrich. See Pet. 44 (citing Ex. 1404, 12:52–55); see also Prelim. Resp. 27 (citing Ex. 1404, 12:47–59)). The cited paragraph of Heinrich states:

In the examples described in detail above, the scheduler 120 schedules the IPC activities for communicating from the baseband processor 104 to the application processor 106. In that

case, the application processor 106 is the remote processor for the IPC and the baseband processor 104 is the local processor for the IPC. *A scheduler may implement the same scheduling techniques as those described above, but configured to schedule IPC activities from the application processor 106 to the baseband processor 104. In the same way, as described above, the scheduler may group non real-time sensitive IPC activities together (e.g. using lazy timers) to thereby send IPC activities in a group from the application processor 106 to the baseband processor.* The scheduler for scheduling IPC activities for communicating from the application processor 106 to the baseband processor 104 may, or may not, be the same as the scheduler 120 which schedules the IPC activities for communicating from the baseband processor 104 to the application processor 106 as described above.

Ex. 1404, 12:47–64 (emphasis added). The paragraph discloses implementing the same buffering and transmission scheduling techniques in *both* directions of communication between baseband (modem) processor 104 and application processor 106. We agree with Petitioner that this paragraph expressly discloses that Heinrich’s scheduling techniques may be applied in either or both directions of communication. Petitioner relies on Balasubramanian merely for its express disclosure of a first processor’s receipt of data from a second processor triggering the first processor to send buffered (held) data to the second processor. Thus, we are persuaded the combination of Heinrich and Balasubramanian teaches or suggests either or both of two coupled processors holding data destined for the other processor and triggering the transmission of buffered (held) data to the other processor in response to (triggered by) receipt of data from the other processor.

For the above reasons, on the record before us and for purposes of this preliminary decision, we are persuaded that the *combination* of Heinrich and Balasubramanian teaches or suggests “the application processor configured

to hold application processor to modem processor data until triggered by receipt of the modem processor to application processor data from the modem processor through the interconnectivity bus” as recited in claim 1.

We have reviewed Petitioner’s arguments and supporting evidence regarding the other limitations of claim 1. Patent Owner does not raise other issues regarding Petitioner’s analysis of claim 1. We find Petitioner’s arguments and supporting evidence persuasive. On the record before us and for purposes of this preliminary decision, we are persuaded that the *combination* of Heinrich and Balasubramanian teaches or suggests the elements of claim 1.

Claim 9 depends from claim 1 and further recites, “the application processor comprises the mode timer.” Petitioner argues the combination teaches or suggests the additional features of claim 9. Pet. 55–57. Patent Owner does not provide arguments directed to Petitioner’s analysis of claim 9 apart from the above discussion of claim 1. We have reviewed Petitioner’s arguments and supporting evidence regarding the other limitations of claim 9. We find Petitioner’s arguments and supporting evidence persuasive. Therefore, we are persuaded Petitioner has established a reasonable likelihood of prevailing in showing that claim 9 is unpatentable as obvious over the combination of Heinrich and Balasubramanian.

3. Claims 11–13, 26, and 27

Claims 11–13 depend from claim 1. Petitioner identifies the limitations of claims 11–13 as taught or suggested in the combination of Heinrich and Balasubramanian. Pet. 57–64. Patent Owner does not address these claims apart from the above discussion of claim 1.

We have reviewed Petitioner's arguments and supporting evidence regarding limitations of claims 11–13 and find them persuasive. We are persuaded Petitioner has established a reasonable likelihood of prevailing in showing that claims 11–13 are unpatentable as obvious over the combination of Heinrich and Balasubramanian.

Independent claims 26 and 27 each recite elements similar to features of claims 1 and 11–13. Petitioner identifies the limitations of claims 26 and 27 as taught or suggested in the combination of Heinrich and Balasubramanian. Pet. 64–69. Patent Owner does not address these claims apart from the above discussion of claim 1.

We have reviewed Petitioner's arguments and supporting evidence regarding limitations of claims 26 and 27 and find them persuasive. We are persuaded Petitioner has established a reasonable likelihood of prevailing in showing that claims 26 and 27 are unpatentable as obvious over the combination of Heinrich and Balasubramanian.

III. CONCLUSION

For the foregoing reasons, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that at least one of claims 9, 11–13, 26, and 27 of the '490 patent is unpatentable. At this preliminary stage, we have not made a final determination with respect to the patentability of the challenged claim or any underlying factual and legal issues.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 9, 11–13, 26, and 27 of U.S. Patent No. 9,535,490 B2 is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of U.S. Patent No. 9,535,490 B2 shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

For PETITIONER:

Jason Kipnis
jason.kipnis@wilmerhale.com

David Cavanaugh
david.cavanaugh@wilmerhale.com

Joseph Haag
joseph.haag@wilmerhale.com

For PATENT OWNER:

David Maiorana
dmaiorana@jonesday.com

Matthew Johnson
mwjohanson@jonesday.com

Joseph Sauer
jmsauer@jonesday.com

Richard Graham
ragraham@jonesday.com

IPR2018-01346
Patent 9,535,490 B2

Joshua Nightingale
jrnightingale@jonesday.com

David Cochran
dcochran@jonesday.com