

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

SONRAI MEMORY LIMITED,
Patent Owner.

IPR2023-00975
Patent 6,874,014 B2

Before GREGG I. ANDERSON, STACEY G. WHITE, and
JOHN D. HAMANN, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

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

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a petition for *inter partes* review of claims 1, 3, 5, 7, 11–13, and 15 (“the challenged claims”) of U.S. Patent No. 6,874,014 B2 (Ex. 1001, “the ’014 patent”). Paper 1 (“Pet.”). Sonrai Memory Limited (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). In addition, Petitioner filed a Notice of Multiple Petitions. Paper 3 (“Notice”).

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) (2018); *see* 37 C.F.R. § 42.108 (2022). Upon consideration of the papers, we conclude that the information presented shows that there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one challenged claim of the ’014 patent.

A. *Real Parties-in-Interest*

The parties identify themselves as the real parties-in-interest. Pet. 1; Paper 4, 2.

B. *Related Matters*

The parties identify *Sonrai Memory Ltd. v. Apple Inc.*, 6-22-cv-00787 (W.D. Tex.) (“the related district court litigation”) and *Apple Inc. v. Sonrai Memory Limited*, IPR2023-00819 (PTAB), as matters that may affect, or be affected by, a decision in this proceeding. Pet. 1; Paper 4, 2. Petitioner also submits that the ’014 patent previously was the subject of IPR2021-01454, which was terminated, without deciding the merits. Pet. 1–2. In addition, Petitioner also filed a petition challenging the same claims of the ’014 patent on April 12, 2023 (IPR2023-00819), for which we instituted trial.

C. The Challenged Patent

The '014 patent “is generally related to a computer chip architecture having multiple processors on a single die,” and “[m]ore particularly, . . . is related to a multiprocessing chip utilizing multiple operating systems.” Ex. 1001, 1:6–9. The '014 patent teaches having multiple processors mounted on a single die, which “is connected to a memory storing multiple operating systems.” *Id.* at code (57). “Each of the processors or a group of one or more of the processors is operable to execute a distinct one of the multiple operating systems.” *Id.* “Therefore, resources for a single operating system may be dedicated to one processor or a group of processors.” *Id.* “Consequently, a large number of processors mounted on a single die can operate efficiently,” according to the '014 patent. *Id.*

Figure 3, shown below, shows “an embodiment of a multiprocessing scheme,” in accordance with the '014 patent. *Id.* at 2:54–55.

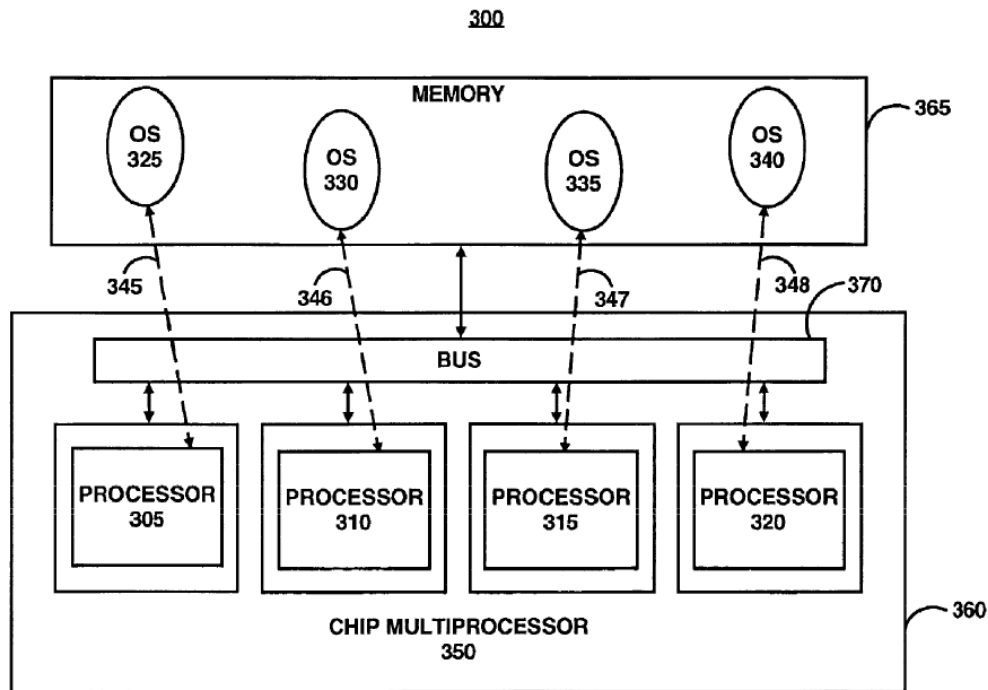


FIG. 3

Figure 3 “illustrates an embodiment including a computer system 300 employing the principles of the” ’014 patent. *Id.* at 3:4–6. As illustrated, “[s]ystem 300 includes a chip multiprocessor 350 having multiple processors 305–320 mounted on a single die 360.” *Id.* at 3:6–7, Fig. 3. “The processors 305–320 function with operating systems 325–340 respectively, as illustrated by connections 345–348.” *Id.* at 3:8–10. “The operating systems 325–340 are stored in a memory 365.” *Id.* at 3:10–11. The ’014 patent discloses that “[d]uring operation, each processor 305–320 may access a respective operating system 325–340 by communicating with the memory 365, for example, via a bus 370.” *Id.* at 3:11–15.

The ’014 patent discloses that “[p]rocessors 305–320 may be configured, such that each processor executes its own operating system,” or “[m]ultiple processors (e.g., multiple processors in a processor group) may . . . be configured to execute a single operating system.” *Id.* at 3:21–24. Moreover, “[e]ach processor may be capable of executing a single operating system, or capable of simultaneously executing multiple operating systems, for example, by context switching, which may include rapidly switching between multiple operating systems.” *Id.* at 3:46–50.

D. The Challenged Claims

Petitioner challenges claims 1, 3, 5, 7, 11–13, and 15 of the ’014 patent. Claims 1, 7, and 12 are independent claims. Claim 1 is illustrative of the challenged claims and is reproduced below:

1. A multiprocessing system comprising:
 - multiple processors mounted on a single die; and
 - multiple operating systems residing in a memory connected to said multiple processors,
 - wherein each of said multiple processors executes an operating system of said multiple operating systems, and two or more of said multiple processors are capable of simultaneously

executing two or more operating systems of said multiple operating systems.

Ex. 1001, 4:14–22.

E. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims of the '014 patent are unpatentable based on the following grounds:¹

Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis
1, 3, 5, 7, 11–13, 15	103(a)	Gulick, ³ Applicant Admitted Prior Art (“AAPA”)
1, 3, 5, 7, 11–13, 15	103(a)	AAPA, Gulick

Pet. 19–88. Petitioner submits in support of its arguments the Declaration of Dr. Martin Walker (Ex. 1002).

II. DISCRETIONARY DENIAL UNDER *FINTIV*

Patent Owner argues that we should exercise our discretion and deny institution pursuant to 35 U.S.C. § 314(a) due to the related district court litigation, which Patent Owner argues will address patentability prior to our deadline for a final written decision. Prelim. Resp. 2–12.

Institution of *inter partes* review is discretionary. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”); 35 U.S.C.

¹ Petitioner relies on various teaching of Gulick and AAPA, and thus, presents the combination of Gulick and AAPA as separate grounds with (i) Gulick modified by AAPA and (ii) AAPA modified by Gulick. We maintain this convention for our analysis and Decision.

² The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the '014 patent issued from an application filed before March 16, 2013, we apply the pre-AIA version of the statutory basis for unpatentability.

³ US 6,314,501 B1, issued Nov. 6, 2001 (Ex. 1005, “Gulick”).

§ 314(a). The advanced state of a parallel district court action is a factor that may weigh in favor of denying a petition under § 314(a). *See NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential). We consider the following factors to assess “whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding”:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). In evaluating these factors, we “take[] a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* at 6.

In addition, the Director has issued additional guidance on the application of *Fintiv*. *See* Katherine K. Vidal, *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation* (June 21, 2022)⁴ (“*Fintiv Memo*”).

⁴ Available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621.pdf.

Upon consideration of these factors and the parties' arguments, we decline to deny institution under § 314(a) for the reasons below.

A. Factor 1: whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted

Under the first *Fintiv* factor, we consider “whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted.” *Fintiv*, Paper 11 at 6. Patent Owner argues that this factor weighs against institution. Prelim. Resp. 4–6. In particular, Patent Owner argues that Judge Albright in the related district court litigation is aware of this *inter partes* review proceeding, but has not issued a stay. *Id.* at 4. In addition, Patent Owner argues that Petitioner has not moved for a stay, and if Petitioner were to move for a stay, it would be denied in view of Judge Albright’s record in refusing such requests. *Id.* at 5–6.

We decline to speculate whether the district court would grant a stay in the related district court litigation pending this proceeding. Notably, Patent Owner does not identify any statements by the district court or other evidence that specifically addresses a stay in the related district court litigation. *See id.* And “[a] judge determines whether to grant a stay based on the facts of each specific case as presented in the briefs by the parties.” *See Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15 at 12 (PTAB May 13, 2020) (informative). “We decline to infer, based on actions taken in different cases with different facts, how the [d]istrict [c]ourt would rule should a stay be requested by the parties in the parallel case here.” *Id.*

Accordingly, we determine that this factor is neutral.

B. Factor 2: proximity of the court's trial date to the Board's projected statutory deadline for a final written decision

Under the second *Fintiv* factor, we consider the “proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision.” *Fintiv*, Paper 11 at 6. The Amended Scheduling Order in the related district court litigation currently sets trial for July 8, 2024, which is about four months before the projected statutory deadline for a final written decision in this proceeding. Ex. 2002, 2.

“Additionally, [however,] when considering the proximity of the district court’s trial date to the date when the PTAB final written decision will be due, the PTAB will consider the median time from filing to disposition of the civil trial for the district in which the parallel litigation resides.” *Fintiv* Memo 3 (footnote omitted). The most recent statistics show a median time-to-trial in the Western District of Texas of 26.4 months. Ex. 2009, 5. Hence, a projected trial date would be in late September 2024, which is about three months before the projected statutory deadline for a final written decision in this proceeding. *See id.*; Prelim. Resp. 1 (stating that the related district court litigation was filed on July 15, 2022).

Accordingly, this factor weighs against institution.

C. Factor 3: investment in the parallel proceeding by the court and the parties

Under the third *Fintiv* factor, we consider the “investment in the parallel proceeding by the court and the parties.” *Fintiv*, Paper 11 at 6. In its Preliminary Response, Patent Owner argues that “[b]y the deadline for an institution decision . . . , fact discovery will have been well underway and will close only five weeks later.” Prelim. Resp. 8 (citing Ex. 2002 (Amended Scheduling Order, 1)). In fact, the Amended Scheduling Order,

sets January 23, 2024 for the close of fact discovery and March 20, 2024 for the close of expert discovery. Ex. 2002, 1. In addition, the dispositive motion deadline was set for April 17, 2024. *Id.* Thus, although resources have been invested in the related litigation by the parties and the district court, there is still a substantial amount of work to be completed by both the parties and the district court as to issues of unpatentability.

In addition, we find unavailing Patent Owner’s argument that “[c]laim construction has been completed and a Claim Construction Order has been issued.” Prelim. Resp. 9. As Patent Owner notes, “[t]he parties agreed on all disputed terms with respect to the ’014 patent, obviating the need for Judge Albright to issue a claim construction order with respect to the ’014 patent.” *Id.* (citing Ex. 2005, 2, 4; Ex. 2006, 1; Pet. 15–18). Thus, the resources invested in the related litigation by the parties and the district court as to claim construction for the challenged patent are limited.

Accordingly, this factor favors institution.

D. Factor 4: overlap between issues raised in the petition and in the parallel proceeding

Under the fourth *Fintiv* factor, we consider the “overlap between issues raised in the petition and in the parallel proceeding.” *Fintiv*, Paper 11 at 6. “[I]f the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding, this fact has favored denial.” *Id.* at 12 (footnote omitted). “Conversely, if the petition includes materially different grounds, arguments, and/or evidence than those presented in the district court, this fact has tended to weigh against exercising discretion to deny institution under *NHK*.” *Id.* at 12–13 (footnote omitted).

In this proceeding, “Petitioner stipulates that if the Board institutes IPR, Petitioner will not assert invalidity of the challenged claims in the district court litigation using the grounds asserted in this [P]etition.” Pet. 90. As Petitioner submits, this stipulation is in accord with the stipulation provided in *Sand Revolution II, LLC v. Continental Intermodal Group—Trucking LLC*, IPR2019-01393, Paper 24 at 11–12 (PTAB June 16, 2020) (informative), which the Board found “mitigates to some degree the concerns of duplicative efforts between the district court and the Board, as well as concerns of potentially conflicting decisions,” and thus found “that this factor weighs marginally in favor of not exercising discretion to deny institution under 35 U.S.C. § 314(a).” Petitioner’s stipulation in this proceeding is narrower than the stipulation in *Sotera*,⁵ and the *Fintiv* Memo does not suggest that we should refrain from denying the Petition on the basis of Petitioner’s narrower stipulation.

Accordingly, we find that this factor weighs marginally in favor of institution.

E. Factor 5: whether the petitioner and the defendant in the parallel proceeding are the same party

Under the fifth *Fintiv* factor, we consider “whether the petitioner and the defendant in the parallel proceeding are the same party.” *Fintiv*, Paper 11 at 6. If the petitioner here were unrelated to the defendant in the parallel proceeding, that might weigh against discretionary denial. *See id.* at 13–14. Here, however, Petitioner is the defendant in the parallel proceeding. Thus, this factor weighs against institution.

⁵ *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 13–14 (PTAB Dec. 1, 2020) (precedential).

F. Balancing the First Five Fintiv Factors

We have considered the circumstances and facts before us in view of *Fintiv* factors 1–5. Because our analysis is fact driven, no single factor is determinative of whether we exercise our discretion to deny institution under § 314(a). Considering these *Fintiv* factors as part of a holistic analysis, we are persuaded that the interests of the efficiency and integrity of the system would be best served by invoking our authority under § 314(a) to deny institution. Thus, we now turn to a compelling merits analysis under factor six. *See CommScope Technologies LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23, at 5 (PTAB Feb. 27, 2023) (precedential, decision upon Director review) (“In circumstances where . . . the Board’s analysis of *Fintiv* factors 1–5 favors denial of institution, the Board shall then assess compelling merits.”).

G. Factor 6: other circumstances that impact the Board’s exercise of discretion, including the merits

Under the sixth *Fintiv* factor, we consider “other circumstances that impact the Board’s exercise of discretion, including the merits.” *Fintiv*, Paper 11 at 6. “[I]f the merits of a ground raised in the petition seem particularly strong on the preliminary record, this fact has favored institution.” *Id.* at 14–15 (footnote omitted).

Notably, “compelling, meritorious challenges will be allowed to proceed at the PTAB even where district court litigation is proceeding in parallel.” *Fintiv* Memo 4. “Compelling, meritorious challenges are those in which the evidence, if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” *Id.* Furthermore, as the Director stated:

[A] compelling-merits challenge is a higher standard than the reasonable likelihood required for the institution of an IPR under 35 U.S.C. § 314(a). A challenge can only “plainly lead to a conclusion that one or more claims are unpatentable” (*id.*) if it is highly likely that the petitioner would prevail with respect to at least one challenged claim. I recognize that all relevant evidence likely will not have been adduced at the point of institution; trial should produce additional evidence that may support a determination in the Final Written Decision that unpatentability has not been adequately proven. Thus, a determination of “compelling” merits should not be taken as a signal to the ultimate conclusion after trial.

OpenSky Indus., LLC v. VLSI Tech. LLC, IPR2021-01064, Paper 102 at 49–50 (PTAB Oct. 4, 2022) (precedential, decision upon Director review) (citing *Fintiv* Memo 4).

The Director also has stated that “the Board shall provide its reasoning in determining whether the merits are compelling.” *CommScope*, Paper 23, at 4 (quoting *OpenSky Indus.*, Paper 102 at 50) (emphasis omitted). The Director cited to the Decision on Remand Assessing Merits at Institution in *Open Sky Industries* as an example “providing a compelling merits analysis with sufficient reasoning.” *Id.* at 6 (citing *OpenSky Indus., LLC v. VLSI Tech. LLC*, IPR2021-01064, Paper 107 at 4–11 (PTAB Oct. 14, 2022)). In this Decision on Remand, the panel looked back at the institution arguments for uncontested limitations and viewed them under the compelling-merits higher standard, before finding that the higher standard was met. *OpenSky Indus.*, Paper 107 at 8. We do the same here.

Patent Owner’s Preliminary Response does not challenge Petitioner’s arguments regarding Gulick’s teachings and AAPA. *See generally* Prelim. Resp. Our review of those arguments and teachings below finds that they support institution (see *infra* Section VII.B), and upon further review, we

conclude that Petitioner's arguments and evidence, if unrebutted at trial, would plainly lead to a conclusion of unpatentability.

We find unavailing Patent Owner's argument that "Petitioner has not presented a 'particularly strong' case of unpatentability because it is based solely on alleged obviousness and not anticipation." Prelim. Resp. 12. Patent Owner does not provide any basis for this argument. *Id.* To the contrary, "[a] petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent . . . on a ground that could be raised under section 102 *or* 103" 35 U.S.C. § 311(b) (emphasis added). Thus, the merits of a challenge is compelling when the evidence, if unrebutted in trial, plainly leads to a conclusion that one or more claims are obvious by a preponderance of the evidence. Such is the case here.

Accordingly, we find that Petitioner has presented a compelling, meritorious challenge to at least claim 1 of the '014 patent. Thus, we decline to exercise discretion to deny institution under § 314(a). *See Fintiv Memo* 5 ("[T]he PTAB will not deny institution based on *Fintiv* if there is compelling evidence of unpatentability."); *Commscope*, Paper 23 at 4 (same).

III. DISCRETIONARY DENIAL FOR MULTIPLE PETITIONS

The Petition in this proceeding is the second petition that Petitioner has filed directed to the challenged claims of the '014 patent. Petitioner also filed a petition on April 12, 2023 in IPR2023-00819, for which we instituted trial on November 21, 2023. Of note, the Petition in this proceeding was filed on May 26, 2023, which was almost three months before Patent Owner filed its preliminary response on August 23, 2023 in IPR2023-00819. Thus, these two petitions are parallel petitions, and not serial petitions as Patent

Owner argues. Consolidated Trial Practice Guide (November 2019)⁶ (“CTPG”), 59 (explaining that parallel petitions are “[t]wo or more petitions filed against the same patent at or about the same time (e.g., before the first preliminary response by the patent owner)”; Prelim. Resp. 15.

Petitioner argues that it has presented two petitions “[i]n view of a potential priority dispute regarding the effective filing date of the [c]hallenged [c]laims.” Notice 2. More specifically, Petitioner argues that “the ’014 [p]atent is entitled to a first-to-invent priority standard,” and “Patent Owner has not conceded that it cannot establish a priority date earlier than the filing date of the” application for the ’014 patent. *Id.* Petitioner argues that “Patent Owner therefore could possibly defeat both challenges in [IPR2023-00819] by establishing a priority date . . . about four months prior to the May 29, 2001 filing date of the ’014 patent.” *Id.* at 3. In contrast, “Gulick is prior art . . . with a priority date of December 18, 1998,” according to Petitioner. *Id.*

We agree with Petitioner that under the circumstances of this proceeding, “[t]he potential priority dispute between the two parties justifies institution of the two petitions.” Notice 4. In particular, the CTPG “recognizes that there may be circumstances in which more than one petition may be necessary, including, for example, . . . when there is a dispute about priority date requiring arguments under multiple prior art references.” CTPG, 59. The CTPG provides that a “patent owner may seek to avoid additional petitions by proffering a stipulation . . . that certain references qualify as prior art.” *Id.* at 61. Patent Owner makes no such stipulation here. *See* Prelim. Resp. 13–16.

⁶ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

In addition, we find unavailing Patent Owner’s arguments applying *General Plastic Indus. Co. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 (Sept. 6, 2017) (precedential). Prelim. Resp. 13–16. Again, the petitions in IPR2023-00819 and in this proceeding are parallel petitions—not serial petitions. CTPG, 59. Thus, Patent Owner’s *General Plastic* analysis is inapposite.

Accordingly, we decline to exercise discretion to deny institution of parallel petitions under § 314(a).

IV. LEVEL OF ORDINARY SKILL IN THE ART

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner argues that one of ordinary skill in the art “would have had at least a bachelor’s degree in electrical engineering, computer science, computer engineering, or an equivalent, and at least two years of experience relating to the field of computer processor architecture.” Pet. 7 (citing Ex. 1002 ¶ 16). Petitioner adds that “[a]dditional education could substitute for experience in the field, and vice versa.” *Id.*

For purposes of this Decision, we adopt Petitioner’s definition of the level of skill for one of ordinary skill in the art, except we decline to adopt

the recitals of “at least” as that language is vague and open-ended. Pet. 7. As adopted, we view the definition for the level of ordinary skill is consistent with the ’014 patent and the asserted prior art, and we apply it in our analysis below.

V. CLAIM CONSTRUCTION

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b); 83 Fed. Reg. 51,340, 51,340–41, 51,343 (Oct. 11, 2018). In applying such standard, claim terms generally are given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “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 submits proposed constructions for the following five terms: (i) “simultaneously executing two or more operating systems,” (ii) “multiple operating systems residing in a memory,” (iii) “multiple processors are connected to said memory via a bus,” (iv) “processor means,” and (v) “memory means.”⁷ Pet. 15–18. Patent Owner submits the same

⁷ Petitioner also submits that “operating system means” should have its plain and ordinary meaning. Pet. 18.

proposed constructions for the first four of these terms, and does not address the “memory means” term. Prelim. Resp. 17–18.

Of these terms which are recited in claim 1, the parties agree that (i) “simultaneously executing two or more operating systems” means “simultaneously executing two or more independent operating systems” and (ii) “multiple operating systems residing in a memory” means “multiple operating systems residing in the same memory.” We apply these constructions in our analysis below of Petitioner’s showing for claim 1. *See infra* Section VI.C.

At this stage of the proceeding, Patent Owner does not address Petitioner’s arguments that the asserted references teach the challenged claims. *See generally id.* We determine that no further express constructions are needed for us to render our Decision on Institution. *See, e.g., Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’”).

VI. PRINCIPLES OF LAW

A claim is unpatentable under 35 U.S.C. § 103(a) 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 of the invention to a person having ordinary skill in the art. *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 ordinary skill in the art; and (4) objective evidence

of non-obviousness, if present. *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

VII. ALLEGED OBVIOUSNESS OVER GULICK AND AAPA

Petitioner argues that the combination of Gulick and AAPA renders claims 1, 3, 5, 7, 11–13, and 15 obvious. Pet. 19–59. At this stage in the proceeding, Patent Owner does not address Petitioner’s arguments and evidence. We focus on challenged claim 1, which is illustrative of the challenged claims, for the analysis we provide below. For the reasons that follow, we determine that Petitioner establishes a reasonable likelihood that it would prevail in showing that the combination of Gulick and AAPA renders at least claim 1 obvious.

A. *Summary of Gulick*

Gulick relates to “a computer system that operates multiple operating systems in different partitions on the computer system and that allows the different partitions to communicate with one another through shared memory.” Ex. 1005, 2:14–18. More specifically, Gulick teaches “[a] computer system [that] comprises a plurality of processing modules that can be configured into different partitions within the computer system, and a main memory.” *Id.* at code (57). “Each partition operates under the control of a separate operating system,” and “[a]t least one shared memory window is defined within the main memory to which multiple partitions have shared access, and each partition may also be assigned an exclusive memory window.” *Id.* In addition, Gulick teaches that “[p]rogram code executing on

different partitions enables those partitions to communicate with each other through the shared memory window.” *Id.*

B. Challenged Claim 1

1. A Multiprocessing System (Preamble)

Petitioner argues that Gulick teaches “[a] multiprocessing system,” as recited in the preamble of claim 1. Pet. 19–21. More specifically, Petitioner argues that Gulick teaches “a multi-processor system that includes processor modules 110, 112, and 114.” *Id.* at 19–20 (citing Ex. 1005, 10:53–54, Fig. 1; Ex. 1002 ¶ 73); *see also id.* at 20–21 (citing Ex. 1005, 11:22–32, Fig. 2; Ex. 1002 ¶¶ 74–75) (arguing that Gulick provides a detailed description of an embodiment of a multi-processor system).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that Gulick teaches “[a] multiprocessing system.” In light of our finding, we need not, and thus do not, reach whether claim 1’s preamble is limiting.

2. Multiple Processors

Petitioner argues that the combination of Gulick and AAPA teaches “multiple processors mounted on a single die,” as recited in claim 1. Pet. 22–31. More specifically, Petitioner argues that Gulick teaches “a computer system that includes processor modules 110–114 . . . labeled as ‘processor(s)’ in Fig[ure] 1,” and that “[e]ach processor module 110–114 ‘can . . . include a plurality of processors.’” *Id.* at 22 (citing Ex. 1005, 10:53–54, 10:59–60; Ex. 1002 ¶ 79).

In addition, “[t]he ’014 patent discloses that it is well known for a computer system to have multiple processors mounted on a single die,” according to Petitioner. *Id.* at 24. More specifically, Petitioner argues that

the '014 patent discloses a “conventional multiprocessing scheme . . . [that] includes a computer system having a chip multiprocessor 295” that “includes multiple processors 210–240 on a single die 290.” *Id.* at 24–25 (quoting Ex. 1001, 1:34–37, Fig. 2; citing Ex. 1002 ¶¶ 84–85) (alterations in original).

Petitioner argues that one of ordinary skill in the art “would have found it obvious in light of AAPA to configure the system in Gulick so that its multiple processors are ‘mounted on a single die,’ as claimed, and would have had a reasonable expectation of success in so doing.” *Id.* at 25. According to Petitioner, “[s]uch an implementation would have been a straightforward combination of well-known technologies using known methods and would have had predictable results.” *Id.* at 26 (citation omitted). In particular, Petitioner argues that “the benefits of having multiple processors on a single die in a multi-processor system were well known in the art.” *Id.* at 27 (citing Ex. 1002 ¶ 90); *see also id.* at 27–28 (citing Ex. 1007,⁸ 1; Ex. 1008,⁹ Abstract; Ex. 1009,¹⁰ 1:48–60; Ex. 1010,¹¹ 292); *id.* at 29 (citing Ex. 1001, 1:34–44, Fig. 2; Ex. 1002 ¶ 91) (arguing that the '014 patent acknowledges that “using multiple processors mounted on a single die in a computer system as conventional and beneficial”).

⁸ Alan Joch, *HOW-TO Chip Multiprocessing*, COMPUTERWORLD, Nov. 27, 2000.

⁹ Kunle Olukotun et al., *The Case for a Single-Chip Multiprocessor*, ACM SIGPLAN Notices, vol. 31, issue 9, Sept. 1996.

¹⁰ US 6,550,020 B1, issued Apr. 15, 2003.

¹¹ Luiz André Barroso et al., *Piranha: A Scalable Architecture Based on Single-Chip Multiprocessing*, Proc. 27th ACM Int’l Symp. Computer Architecture, 2000.

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that the combination of Gulick and AAPA teaches “multiple processors mounted on a single die.” We also find, at this stage of the proceeding, that Petitioner has provided sufficiently articulated reasoning with rational underpinning to support Petitioner’s combining of Gulick and AAPA for this limitation. *See Kahn*, 441 F.3d at 988, *cited with approval in KSR*, 550 U.S. at 418.

3. *Multiple Operating Systems*

Petitioner argues that Gulick teaches “multiple operating systems residing in a memory connected to said multiple processors,” as recited in claim 1. Pet. 31–38. More specifically, Petitioner argues that Gulick teaches “that its multi-processor system includes main memory 160,” which “is a directory-based memory system and is capable of supporting various memory consistency models.” *Id.* at 31 (citing Ex. 1005, 10:53–67; quoting *id.* at 11:33–37). According to Petitioner, Gulick’s main memory 160 “includes a plurality of memory storage units (MSUs) 220, such as memory storage units 220A, 220B, 220C, and 220D.” *Id.* (quoting Ex. 1005, 11:37–39; citing Ex. 1002 ¶ 98).

In addition, Petitioner argues that Gulick teaches an exemplary memory configuration that can be generated on a computer system, which includes “three operating systems” each of which “has its own address space.” *Id.* (quoting Ex. 1005, 13:30–36; citing Ex. 1002 ¶ 99). According to Petitioner, Gulick’s Figure 5 illustrates three exclusive memory windows that “are defined within the address space 504 of main memory 160” and a shared memory, “which is accessible by all three operating systems.” *Id.* at 32–33 (quoting Ex. 1005, 13:37–43; citing *id.* at Fig. 5). Petitioner adds that

Gulick teaches that a memory window “is defined within the main memory to which multiple partitions have shared access.” *Id.* at 33 (quoting Ex. 1005, code (57)). Petitioner argues that “[t]hus, Gulick discloses that a memory window is a portion of the main memory.” *Id.* (citing Ex. 1002 ¶ 100).

In addition, Petitioner argues that Gulick teaches that each operating system resides in a respective memory window in main memory, and in particular, Gulick teaches that “[f]or each different partition configured within the computer system, the main memory may further have defined therein an exclusive memory window to which only that partition has access and *in which* the operating system of that partition executes.” *Id.* (quoting Ex. 1005, 2:66–3:5; citing Ex. 1002 ¶ 101) (alterations in original).

According to Petitioner, one of ordinary skill in the art would have understood “that if an operating system executes within a memory window assigned to the partition, then that operating system is stored in the memory window because the processor executes the operating system from the memory address where it is stored.” *Id.* (citing Ex. 1002 ¶ 102).

Furthermore, Petitioner argues that Gulick teaches that the memory is “connected to said multiple processors” and that the multiple operating systems reside in the “same memory.” *Id.* at 36–38 (citing Ex. 1002 ¶¶ 106, 111).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that Gulick teaches “multiple operating systems residing in a memory connected to said multiple processors.”

4. *Wherein Each of Said Multiple Processors*

Petitioner argues that Gulick teaches “wherein each of said multiple processors executes an operating system of said multiple operating systems, and two or more of said multiple processors are capable of simultaneously executing two or more operating systems of said multiple operating systems,” as recited in claim 1. Pet. 38–40. More specifically, Petitioner argues that Gulick teaches “one or more processor modules and a main memory having one or more memory storage units . . . that allows a plurality of operating systems to concurrently execute in different partitions within the computer system.” *Id.* at 39 (quoting Ex. 1005, 8:47–53). In particular, Petitioner argues that Gulick’s processor modules 110–114 “may be configured as a separate partition within the computer system, such that multiple partitions may exist within the computer system,” and that each partition operates “under the control of a separate operating system.” *Id.* (quoting Ex. 1005, 11:1–5). Furthermore, Gulick teaches that “each processor module 110, 112, and 114 . . . can be defined as a separate partition controlled via a separate operating system 170, 172, and 174,” according to Petitioner. *Id.* (quoting Ex. 1005, 11:5–10, Fig. 1; citing Ex. 1002 ¶ 116).

In addition, Petitioner argues that Gulick teaches that the “two or more of said multiple processors are capable of simultaneously executing two or more operating systems of said multiple operating systems,” as claimed. *Id.* More specifically, Petitioner argues that Gulick teaches “allow[ing] a plurality of operating system to *concurrently execute* in different partitions within the computer system.” *Id.* (quoting Ex. 1005, 8:47–53; Ex. 1002 ¶ 117) (alterations in original).

In addition, Petitioner argues that Gulick teaches that “each partition operates under the control of its own operating system” and that “[t]he operating system executing on different ones of the partitions may be different operating systems, or different instances of the same operating system.” *Id.* at 40 (quoting Ex. 1005, 9:42–46). Petitioner adds that Gulick teaches its “invention contemplates an environment wherein at least two of the operating systems are different and one operating system does not control or manage the second operating system.” *Id.* (quoting Ex. 1005, 13:26–29).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that Gulick teaches “wherein each of said multiple processors executes an operating system of said multiple operating systems, and two or more of said multiple processors are capable of simultaneously executing two or more operating systems of said multiple operating systems.”

5. *Summary*

In summary, based on the current record, and for purposes of this institution decision, we determine that Petitioner shows a reasonable likelihood that it would prevail in showing that claim 1 would have been obvious to one of ordinary skill in the art in view of Gulick and AAPA.

C. *Challenged Claims 3, 5, 7, 11–13, and 15*

At this stage in the proceeding, Patent Owner does not address Petitioner’s arguments and evidence as to how the combination of Gulick and AAPA teaches the limitations of claims 3, 5, 7, 11–13, and 15. We have reviewed Petitioner’s arguments and evidence regarding these claims, and, on the current record, we find them persuasive for purposes of institution.

VIII. ALLEGED OBVIOUSNESS OVER AAPA AND GULICK

Petitioner argues that the combination of AAPA and Gulick renders claims 1, 3, 5, 7, 11–13, and 15 obvious. Pet. 59–88. At this stage in the proceeding, Patent Owner does not address Petitioner’s arguments and evidence as to how the combination of AAPA and Gulick teaches the limitations of these claims. We have reviewed Petitioner’s arguments and evidence regarding these claims, and, on the current record, we find them persuasive for purposes of institution.

IX. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated that there is a reasonable likelihood that it would prevail in proving the unpatentability of at least one of the challenged claims of the ’014 patent. We thus institute an *inter partes* review of all of the challenged claims of the ’014 patent on all grounds asserted in the Petition. *See* 37 C.F.R. § 42.108(a).

Any findings or conclusions in this Decision are made only for the purposes of institution and are not dispositive of any issue. We have not made a final determination with respect to the patentability of any challenged claim. Our final determination will be based on the record as fully developed during trial, including any evidence or argument timely presented by the parties under our Rules.

X. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of the ’014 patent is instituted on all of the challenged claims and all grounds asserted in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial commences on the entry date of this Decision.

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