

2019-1202

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**IN THE  
UNITED STATES COURT OF APPEALS FOR  
THE FEDERAL CIRCUIT**

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**POLARIS INNOVATIONS LIMITED,**  
*Appellant*

v.

**KINGSTON TECHNOLOGY COMPANY, INC.,**  
*Appellee*

**ANDREI IANCU, Director, U.S. Patent and Trademark Office,**  
*Intervenor*

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APPEAL FROM THE UNITED STATES PATENT AND TRADEMARK  
OFFICE, PATENT TRIAL AND APPEAL BOARD NO. IPR2016-01622

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**PRINCIPAL BRIEF OF APPELLANT  
POLARIS INNOVATIONS LIMITED**

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May 24, 2019

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## CERTIFICATE OF INTEREST

Counsel for Appellant Polaris Innovations Limited (“Polaris”) in Appeal No. 2019-1202 certifies the following:

**1. The full name of every party or amicus represented by me is:**

Polaris Innovations Ltd.

**2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:**

Quarterhill Inc.

**3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:**

Wi-LAN Inc.

**4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court (and who have not or will not enter an appearance in this case) are:**

Parham Hendifar, Lowenstein & Weatherwax LLP

**5. The title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this court’s decision in the pending appeal are:**

*Polaris Innovations Limited v. Kingston Technology Company, Inc.*, 8:16-cv-00300 (C.D. Cal).

Dated: May 24, 2019

/s/ Matthew D. Powers

Matthew D. Powers

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### STATEMENT OF RELATED CASES

No appeal from this *inter partes* review (“IPR”) has previously been before this Court or any other court.

The following pending action will be directly affected by this Court’s decision in this appeal: *Polaris Innovations Limited v. Kingston Technology Company, Inc.*, 8:16-cv-300 (C.D. Cal.). That case is currently stayed pending resolution of IPR proceedings.

## **I. STATEMENT OF JURISDICTION**

The Patent Trial and Appeal Board (“Board”) issued its Final Written Decision (“FWD”) in this *inter partes* review (“IPR”), finding claims 1 and 5-8 of U.S. Patent No. 6,850,414 (the “414 Patent”) unpatentable under 35 U.S.C. § 318(a) and denying Polaris’s motion to amend the patent to include substitute claim 9, on February 5, 2018. Appx477-504. After further proceedings, on June 11, 2018, the Board issued an order granting rehearing of the institution decision and the FWD (“Revision Order”) that instituted IPR on issued claim 4 and found it unpatentable. Appx579-594. The Board denied Polaris’s timely request for rehearing on September 10, 2018. Appx1-11. Polaris filed a timely notice of appeal under 35 U.S.C. §§ 141(c), 142, and 319 on November 13, 2018. Appx622-626. This Court has jurisdiction under 35 U.S.C. § 141(c) and 28 U.S.C. § 1295(a)(4)(A).

## **II. STATEMENT OF THE ISSUES**

1. Did the Board violate Polaris’s due process rights and the Board’s own rules when it entered judgment of unpatentability on claim 4 and denied Polaris’s motion to amend the patent to include proposed substitute claim 9 without giving Polaris prior notice of institution of review of claim 4 or any opportunity to file a response to the Petition on that claim, resulting in an erroneous determination on the merits?

2. Did the Board err, in denying Polaris's request in its Motion to Amend to add proposed claim 9, by relying on Kingston's new arguments and evidence opposing claim 9 that were directed only toward already-existing limitations of already-challenged claims, and that could have been submitted in the Petition?

3. Did the exercise of final authority on behalf of the Patent Office which deprived Polaris of property rights by officers not appointed by the President and confirmed by the Senate violate the Appointments Clause, Article II, Section 2, Clause 2, of the United States Constitution?

### **III. STATEMENT OF THE CASE**

#### **A. The '414 Patent**

The '414 Patent, unlike the asserted references in the Petition, is directed to reducing the height of memory modules using printed circuit boards ("PCBs"). Appx154. Specifically, the patent concerns PCBs with at least nine identically designed integrated semiconductor memories connected thereto, one of which is an error correction chip, and discloses, *inter alia*, shifting the orientation of at least eight of the semiconductor memories from a vertical to horizontal orientation while leaving the error correction chip vertical. Appx154-156. Rotating the at least eight semiconductor memories horizontally allows for the horizontally oriented elements to be placed closer together in the vertical direction, thereby resulting in an important

reduction in the overall PCB height. *Id.* Claim 4, including the claim from which it depends, recites the following limitations:

1. An electronic printed circuit board configuration, comprising:

an electronic printed circuit board having a contact strip for insertion into another electronic unit; and

a memory module having at least nine identically designed integrated semiconductor memories;

each one of said semiconductor memories being encapsulated in a rectangular housing having a shorter dimension and a longer dimension;

said housing of each one of said semiconductor memories being identically designed and being individually connected to said printed circuit board;

one of said semiconductor memories being connected as an error correction chip;

said longer dimension of said housing of said error correction chip being oriented perpendicular to said contact strip; and

said longer dimension of said housing of each one of said semiconductor memories, other than said error correction chip, being oriented parallel with said contact strip.

...

4. The printed circuit board according to claim 1, wherein: said printed circuit board has a height of 1 to 1.2 inches perpendicular to said contact strip.

**B. The *Inter Partes* Review**

**1. The Institution and Motion to Amend Stages**

On August 16, 2016, Kingston filed an IPR petition (“Petition”) alleging that all claims of the ’414 Patent were unpatentable based on UK Patent Application GB 2 289 573 A (“Simpson”) alone, PC SDRAM Unbuffered DIMM Specification, Revision 1.0 (“Intel Specification”) alone, or both references in combination. Appx156. The Petition did not explain why a person of ordinary skill in the art (“POSA”) would combine the references, or describe how it was possible to do so. Rather, the Petition theorized that a POSA would have simply known how to fit the two socketed rows of Simpson into the chip described by Intel Specification and done so as “a simple matter of design choice.” Appx44-45. The Petition did not explain why a POSA would want to update the Simpson memory configuration for the Intel Specification. *See* Appx29-30.

The Board instituted on claims 1 and 5-8, but declined to institute on claim 4, as well as claims 2 and 3. *See* Appx168, Appx171, Appx172-173. Claim 4 discloses a specific height limitation, and Simpson does not discuss a height dimension within the claimed range. Addressing claim 4’s alleged obviousness over Simpson, the Board stated: “Petitioner has not explained sufficiently how or why a person of ordinary skill in the art would have modified Simpson to achieve a height of ‘1 to 1.2 inches perpendicular to said contact strip.’” Appx167. Then, addressing claim 4

in the context of Simpson and Intel Specification, the Board explained: “Petitioner continues to rely solely on its argument that the limitations would have been an ‘obvious design choice’ without explaining persuasively how and/or why a person of ordinary skill in the art would have made the proposed modifications to Simpson in view of the teachings of the Intel Specification.” Appx168. The Board instituted review on claims 1 and 5-8 as obvious over Simpson and ordered that “no other grounds are authorized for this *inter partes* review other than those specifically identified above[,]” confirming the failure of Kingston’s combination arguments. Appx172-173.

Within two weeks of that decision, Kingston filed a *new* petition targeting solely claim 4. *Kingston Tech. Co., Inc. v. Polaris Innovations Ltd.*, IPR2017-00974, Paper 2 (“Serial Petition”) (Appx1789 *et seq.*). Kingston raised the same references as the first Petition plus three new references—(1) U.S. Patent Application Publication No. 2002/0006032 (“Karabatsos”), (2) U.S. Patent No. 5,973,951 (“Bechtolsheim”), and (3) U.S. Patent No. 6,038,132 (“Tokunaga”). *Id.* at 9-10 (Appx1801-1802). It also included new declaration testimony. *Id.* The Serial Petition presented two grounds to find Claim 4 unpatentable: Simpson in combination with Karabatsos, and Bechtolsheim in combination with Tokunaga and Karabatsos. *Id.* at 15, 39 (Appx1807, Appx1831). Kingston’s theory of a motivation to combine centered on disclosures found in Karabatsos. *Id.* at 20-21 (Appx1812-1813). As



described below, the Board would soon reject Kingston's new petition as serial and improper, and Kingston would soon inject the same untimely references from its failed serial petition into the *inter partes* review on appeal here. *See infra* at 7-8.

Three days after filing the Serial Petition, Kingston requested rehearing of the Board's decision in this case declining to institute on claim 4. Appx183 *et seq.* The Board denied the request:

Neither the Petition nor Dr. Subramanian addresses, for example, the dimensions of the components taught by Simpson, whether two rows of memory chips would fit on a printed circuit board that has a height of only 1 to 1.2 inches, or—if the memory chips taught by Simpson would not fit—what a person of ordinary skill in the art would have known about the dimensions of similar memory chips as of the critical date that would have made it obvious to fit two rows of them on a printed circuit board having a height of only 1 to 1.2 inches.

Appx214. Having twice received the Board's confirmation that claim 4 was not in this IPR, Polaris filed a motion to amend ("MTA") seeking to voluntarily cancel the instituted claims and substitute proposed claim 9, which would replace claim 8 to include a limitation with the same height dimensions that were included in non-instituted claim 4. Appx228. Polaris explained that its substitute claim, claim 9, "incorporates both the limitations of claim 8 and the limitations of non-instituted claim 4, which the Board has already determined has not been shown to have a reasonable likelihood of being unpatentable by Petitioner in this case." *Id.* The MTA was written not to inject new patentability issues into the IPR trial. *Id.*; Appx283.

Relying on the Board’s decision not to institute on claims 2-4, Polaris did not file a POR, and indeed, *could not have* filed a POR defending claim 4.

While the MTA was pending, but before Kingston filed its opposition, the panel considering the Serial Petition—which had two of the same judges that decided institution in this case—declined to institute. *Kingston*, IPR2017-00974, Paper 8 (Aug. 14, 2017). The Board found that Kingston already knew of Simpson and Intel Specification when it filed its first petition, had Polaris’s preliminary response and institution decision from this case to guide it when crafting the Serial Petition, and offered no explanation for the delay in finding this art or filing the Serial Petition. *Id.* at 12-14. The Board noted that the new art and arguments were “substantially the same” as those in the first petition. *Id.* at 13. Specifically regarding the motivation to combine Simpson with the height dimension of claim 4, the Board observed that the Serial Petition presented “substantially the same argument that [it] determined not to be persuasive” in this case. *Id.* For a third time, Kingston had its challenge to claim 4 rejected.<sup>1</sup>

Four days after the Board’s denial of the Serial Petition, Kingston opposed the MTA (“MTA Opposition”) in this case. Appx238 *et seq.* That opposition included the *same* references and expert declaration that Kingston had submitted in the Serial

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<sup>1</sup> Ultimately, Kingston petitioned for rehearing of the Serial Petition, and lost again. *Kingston*, IPR2017-00974, Paper 11 at 3-5 (P.T.A.B. Oct. 26, 2017).

Petition and which the Board had just concluded were insufficient to institute review of claim 4, as well as other additional evidence specifically targeted to overcome the deficiencies in the Petition and Serial Petition. *See, e.g.*, Appx239-241. Polaris filed a Reply supporting the MTA, arguing that the new evidence was improper. *E.g.*, Appx276 *et seq.*, Appx288-289.

## 2. The Final Written Decision And Rehearing

On February 5, 2018, the Board issued the FWD. Appx477-504. While acknowledging that Polaris “request[ed] cancellation of claims 1 and 5–8 not based on any apparent contingency,” the Board nonetheless addressed the to-be-cancelled claims on the merits. Appx487-490. The Board reasoned that Polaris, by not filing a POR, waived any argument that the claims covered patentable subject matter. Appx487. It then proceeded to find claims 1 and 5-8 unpatentable in light of Simpson alone. Appx490.

As to the MTA, the Board held that because Polaris had “made a strategic decision to propose a substitute amended claim that includes the limitation of challenged and instituted dependent claim 8 along with the limitation of non-instituted dependent claim 4,” Polaris’s MTA had *expanded* the scope of trial to include the patentability of the “limitation of claim 4.” Appx497. The Board determined “that Petitioner has provided an articulated reason with rational underpinning to support the conclusion of obviousness of subject matter having the

recited width and height” for proposed claim 9. Appx501. Although the Board nominally based its conclusion on Simpson and the Intel Specification, the Board also relied extensively on materials first presented with the MTA Opposition. Appx499-500.

Polaris requested rehearing of the FWD on the grounds that the Board should have cancelled claims 1 and 5-8 rather than reaching their substantive patentability and that the Board should not have considered whether the subject matter underlying claim 4 was patentable. *See* Appx505 *et seq.*, Appx513-514.

The Board denied the request, stating that Polaris “does not identify where it previously stated, argued, represented, or requested that the cancelation portion of the Motion to Amend be treated as ‘noncontingent’ or as severable from the portion of the motion seeking to substitute a new claim,” Appx534, even though the Board had described the request in its FWD as “not based on any apparent contingency,” Appx487. The Board reaffirmed its views expressed in the FWD that it could review all the substance of proposed claim 9, not just parts that were “new” to the matter. *E.g.*, Appx533.

### **3. The Revision Order**

After the deadline for all parties to seek rehearing had expired, Kingston sought leave to file an out-of-time request for rehearing of the Institution Decision and FWD to institute review and render judgment of unpatentability on claim 4,

contending that the intervening decision of *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018), justified the out-of-time request. Appx540 *et seq.*, Appx541, Appx543.

During a conference call to discuss how to handle *SAS*, Polaris repeatedly argued that it needed an opportunity to present evidence and arguments about claim 4 because “the only arguments that we have filed post institution are two pages in our reply in support of our motion to amend. . . . The petitioner might argue that had the Board known of *SAS*, it would have fully instituted, but I [assure] you, we would have proceeded very differently. But it came to whether we filed a patent owner response and what, if any, motion to amend was filed.” Appx2348; *see also* Appx2356 (“[W]e filed only two pages of evidence-free argument on these issues because we were relying on the partial institution and the Board’s previous decision in *Amerigen*.”). The Board’s stated goal during the call was to have the parties figure out “how we can wrap up this case in the least painful way.” Appx2358.

The Board granted Kingston’s request to file a late petition for rehearing and asked that the parties brief “whether there is any reason, such as due process concerns, why, after receiving the parties’ submissions regarding Petitioner’s request for rehearing, the Board should not proceed immediately to final written decision on the remaining claims and grounds without further briefing.” Appx546. Kingston filed its rehearing request seeking institution on claim 4, arguing among other things that the Board could decide the patentability of claim 4 without further

briefing. Appx549 *et seq.*, Appx551-553. It also sought to limit the petition to remove claims 2 and 3—two claims that the Board had previously declined to institute trial on. Appx550-551. Polaris responded, objecting that, among other things, it should be permitted to file a response on any newly instituted claims. Appx562 *et seq.*, Appx573. The Board granted Kingston’s rehearing request, and in a single order and without further briefing: modified its “institution decision to institute on all of the challenged claims and all of the grounds presented in the Petition,” including claim 4, Appx585; rejected Kingston’s request to remove claims 2 and 3 from the hearing and concluded that Kingston did not meet its burden to show them to be unpatentable, Appx586-588; and found claim 4 unpatentable based on the analysis of claim 9 in the original FWD, Appx593, Appx579-594. The Board explained its view that “claim 4 and its subject matter have been discussed repeatedly throughout the trial,” and that Polaris was “given many opportunities to address the patentability of the subject matter of the proposed substitute claim 9, including the opportunity to respond to Petitioner’s challenges, which necessarily involved addressing the subject matter of claim 4.” Appx588, Appx589. Finding that “[i]t was Patent Owner’s actions that placed the subject matter of claim 4 at issue in the trial” and that “it is *Patent Owner that, in some sense, instituted a review* of the subject

matter of claim 4,” the Board determined that no further evidence or briefing would be accepted on claim 4. Appx590-591.<sup>2</sup>

On patentability, the Board relied on its prior findings regarding claim 1 (on which no POR was ever filed), *see* Appx588 n.1, and its view that it “necessarily analyzed the patentability of the subject matter of dependent claim 4, which, as mentioned, is broader in scope than that of proposed substitute claim 9,” Appx591. Thus, the Board found claim 4 unpatentable without Polaris ever having had the opportunity at *any stage* of the IPR to file a POR on that claim. Polaris sought rehearing of the Revision Order, which the Board denied. Appx1-11.

This appeal followed.

#### IV. SUMMARY OF ARGUMENT

This case was decided twice below: first, under the Board’s former practice of instituting IPR on fewer than all petitioned claims; then, in the aftermath of the *SAS* decision that denounced that practice as legally impermissible. The Board initially decided not to institute review on claim 4 even though claim 4 was in the petition. This order, instituting on only part of the petition, was not allowed, as all now acknowledge following *SAS*. But as a result of that decision, Polaris was not permitted to file a POR addressing claim 4. Then, when the Board tried to fix its mistake under *SAS*, the Board decided *in a single order* to institute on claim 4, to

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<sup>2</sup> Emphases in quotations are added unless otherwise noted.

bar Polaris from filing a POR on claim 4 even now that it was being instituted, and to find claim 4 unpatentable. This is straightforward. The Board instituted on claim 4 and invalidated it in one stroke. Polaris was never allowed to respond. This cannot stand.

The Board's error in instituting IPR without allowing Polaris to file a POR on all petitioned claims not only infected its decision on issued claim 4, but also on proposed substitute claim 9 from Polaris's MTA. Because any decision against Polaris on the subject matter of claim 4 should have been decided in light of Polaris's right—or lack thereof—to file a POR on claim 4, and because the Board's MTA decision was based on a decision about the merits of claim 4, the same due process violation affecting claim 4 also undermines the Board's decision on substitute claim 9. Accordingly, the Board's decisions on issued claim 4 and on proposed substitute claim 9 were both the result of a clear-cut violation of due process.

The Board compounded its due process violations by improperly allowing Kingston to untimely expand the record substantially beyond the scope of its petition. The Board allowed Kingston to submit substantial new evidence in response to Polaris's motion to amend, where that evidence was not properly responsive to any new subject matter in the motion but instead was directed to the subject matter of claim 4 that was already addressed in Kingston's petition, which the Board had specifically found had not met Kingston's initial burden as petitioner to show that it



was likely to succeed in proving unpatentability. The Board first used this evidence to decide the patentability of proposed substitute claim 9, thus compounding the errors described above with an unfairly, untimely, and improperly supplemented ground of unpatentability. The Board then used that same unfair, improper, and untimely evidence to render issued claim 4 unpatentable. Thus, not only did the Board deprive Polaris of its right to a full and fair response on both of the claims in this appeal, the Board did so on the basis of an evidentiary record that the Board improperly allowed Kingston to expand well beyond the scope of the petition. Indeed, the evidence that the Board relied upon to render both claims unpatentable was the very same evidence that Kingston had already tried and failed to put before the Board in a separate petition that the Board rightly rejected as an improper serial petition in light of the petition now on appeal.

The combined effect of the Board's error in instituting on fewer than all petitioned claims, trying to fix that error by instituting on all claims without allowing Polaris to file its response, citing Polaris's reliance on the Board's erroneous institution decision as evidence against Polaris, and reliance on untimely submitted evidence in opposition to a proposed substitute claim to render unpatentable not only the substitute claim but a previously uninstituted claim, meant that the proceedings systematically deprived Polaris of anything resembling due process. On the one hand, the Board enabled Kingston to lodge new and untimely evidence against subject

matter that the Board itself had refused to find properly within the scope of review, while on the other hand, the Board deprived Polaris of an opportunity to be heard on the issues it would ultimately decide.

Due process demands that a party whose property is placed in jeopardy have the opportunity to speak to and be heard by the tribunal that will decide its fate. The Board violated this fundamental tenet when it proceeded on its improper institution decision, and it violated it again when it tried to fix the problem after *SAS*. The Board's errors systematically barred Polaris at each stage of the proceeding from exercising its established rights to address the issues the Board would ultimately decide. This violated fundamental due process, the core procedural safeguards of the APA, and the Board's own rules.

The Board's errors *per se* require vacatur. Moreover, the decision it produced cannot stand on its own merits: the Board repeatedly cited and relied upon Polaris's lack of response on substantive issues, a lack of response resulting from the Board's own error. Moreover, even on the lopsided record that the Board's due process violations created, the Board failed to articulate why a POSA would have expected to be able to combine Simpson and Intel Specification or why a POSA would have wanted to rely on the Simpson chip layout rather than another chip layout.

Lastly, the Board's decision was an unconstitutional exercise of power reserved for principal officers of the United States by individuals who were neither

appointed by the President nor confirmed by the Senate, and whose decisions are not subject to any sufficient degree of oversight or review by the agency for which they speak unless and until there is remedial intervention by an Article III court. The Board judges in this case wielded a power that the Constitution does not let them wield. Their violation of Polaris's due process rights illustrates the importance of ensuring that no one who is not a constitutionally appointed principal officer be allowed to act as one. This Court should vacate the decision below as unconstitutional under the Appointments Clause.

If the Court does not vacate under the Appointments Clause, the Court should send this case back to the Board for proceedings where Polaris has a full opportunity to respond to the allegations and evidence Kingston actually mustered in its petition, and not be held to defend itself against allegations and evidence that Kingston never had in its petition.

## **V. ARGUMENT**

### **A. Standard Of Review**

In “a formal adjudication like the inter partes review considered here,” this Court “review[s] the Board’s procedures for compliance with the Administrative Procedure Act, 5 U.S.C. § 551 *et seq.*” *Dell, Inc. v. Accelaron, LLC*, 818 F.3d 1293, 1298, 1302 (Fed. Cir. 2016). This Court “review[s] the Board’s IPR decisions to ensure that they are not ‘arbitrary, capricious, an abuse of discretion, . . . otherwise

not in accordance with law . . . [or] unsupported by substantial evidence,” *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 992 (Fed. Cir. 2017), and reviews “the Board’s procedures for compliance with the Administrative Procedure Act (‘APA’) de novo, under which [it] must ‘hold unlawful and set aside agency action . . . not in accordance with the law [or] . . . without observance of procedure required by law,’” *EmeraChem Holdings, LLC v. Volkswagen Grp. of Am., Inc.*, 859 F.3d 1341, 1345 (Fed. Cir. 2017). This Court reviews “the Board’s ultimate determination of obviousness de novo.” *PersonalWeb Techs.*, 848 F.3d at 991. “Constitutional interpretation is . . . a question of law, which [this Court] review[s] de novo.” *Ashley Furniture Indus. v. United States*, 734 F.3d 1306, 1309 (Fed. Cir. 2013).

“Decisions related to compliance with the Board’s procedures are reviewed for an abuse of discretion.” *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016). “An abuse of discretion is found if the decision: (1) is clearly unreasonable, arbitrary, or fanciful; (2) is based on an erroneous conclusion of law; (3) rests on clearly erroneous fact finding; or (4) involves a record that contains no evidence on which the Board could rationally base its decision.” *Id.* (internal citations and quotation marks omitted). “When reviewing the Board’s decisions pursuant to the APA, [this Court] often use[s] the terms ‘abuse of discretion’ and ‘arbitrary and capricious’ interchangeably.” *Unwired Planet, LLC*

v. *Google Inc.*, 841 F.3d 1376, 1379 n.2 (Fed. Cir. 2016), *reh'g en banc denied*, 682 F. App'x 928 (Fed. Cir. 2017) (en banc), *cert. denied*, 138 S. Ct. 1693 (2018).

**B. The Board's Treatment Of Claims 4 and 9 Violated Polaris's Procedural Rights**

The Board violated Polaris's due process rights, as well as the IPR statute and Board's regulations, when it found claim 4 to be unpatentable without allowing Polaris to submit argument and evidence on the merits of claim 4 after belatedly instituting review of that claim following from its previously issuance of a partial institution decision instituting on some but not other petitioned claims, as *SAS Institute* later disallowed. As a result, the Board incorrectly analyzed claim 4 because: Polaris did not have a fair opportunity to defend that claim; and Polaris's defense of claim 9 prior to the Board's decision instituting review on claim 4 was no substitute for the denied opportunity to defend claim 4 itself. The Board compounded the violation by considering *new* evidence submitted improperly with Kingston's MTA Opposition to support its *prima facie* case of obviousness. Ultimately, the Board's errors in handling claim 4 also deprived Polaris of its rights to fairly contest claim 9 as well.

**1. The Board's Attempt To Correct Its Institution Decision Violated Due Process**

The Board's initial institution decision instituted on only a subset of the claims in the Petition. But, as the Supreme Court held later in *SAS*, the Board has a "binary

choice—either institute review or don't.” *SAS Inst., Inc.*, 138 S. Ct. at 1355. Here, as in many cases decided before *SAS*, the Board issued a partial institution decision, which instituted review on claims 1 and 5-8 and denied review on claims 2-4. The Board's initial institution was contrary to law.

Polaris was *never* allowed to submit a POR on claim 4. In a *single* decision prompted by Kingston's untimely rehearing petition, the Board instituted review on claims 2-4 and found claim 4 to be unpatentable based on its analysis of a proposed claim addressed only through the earlier, more abbreviated motion-to-amend briefing process. It did so all without letting Polaris submit post-institution materials on the patentability of claim 4. Thus, until the Board issued its Revision Order, claim 4 was never part of the trial, despite Kingston's numerous attempts to add it. Then, at the instant when the Board issued the Revision Order, claim 4 went from never having been in the proceedings to having review instituted against it and being found, summarily, to be unpatentable. This approach violated Polaris's procedural rights.

First, the Board's decision violated Polaris's due process rights under the United States Constitution and the Administrative Procedure Act. “Under the [APA], the PTO must ensure that the parties before it are ‘fully and fairly treated at the administrative level.’” *Honeywell Int'l Inc. v. Mexichem Amanco Holding S.A. de C.V.*, 865 F.3d 1348, 1357 (Fed. Cir. 2017) (citations and markings omitted). “*SAS*

did not displace the Board’s responsibility to comply with due process.” *AC Techs., S.A. v. Amazon.com, Inc.*, 912 F.3d 1358, 1365 (Fed. Cir. 2019). “[D]ue process dictates that parties before the Board must receive adequate notice of the issues the Board will decide as well as an opportunity to be heard on those issues.” *Id.* “For a formal adjudication like the inter partes review considered here, the APA imposes particular requirements on the PTO. The agency must ‘timely inform[]’ the patent owner of ‘the matters of fact and law asserted,’ 5 U.S.C. § 554(b)(3), must provide ‘all interested parties opportunity for the submission and consideration of facts [and] arguments . . . [and] hearing and decision on notice,’ *id.* § 554(c), and must allow ‘a party . . . to submit rebuttal evidence . . . as may be required for a full and true disclosure of the facts,’ *id.* § 556(d).” *Dell*, 818 F.3d at 1301.

Here, the Board **ruled** that claim 4 was outside the scope of trial. Once Kingston brought the Board’s partial institution error to its attention, Polaris asked for permission to respond to the Petition on claim 4 if the Board decided to institute on it. Appx573; *see* Appx605. The Board denied the request, relying on its claim that the briefing on the prior MTA, when claim 4 was not in the case, had been enough. Appx590. Thus, Polaris had **no prior notice** that the Board might find **claim 4** to be unpatentable and was denied its opportunity to be heard on that issue.

This case is similar to *EmeraChem Holdings, LLC v. Volkswagen Group of America, Inc.*, 859 F.3d 1341 (Fed. Cir. 2017). In *EmeraChem*, the petition tied

specific prior art references to certain claims “with precision.” *Id.* at 1349. The Board then relied on those references to find claims to which the references were not identified against unpatentable. *Id.* at 1349-50. Ultimately, this Court concluded that “the Board denied [patent owner] its procedural rights guaranteed by the APA” where “the Institution Decision did not put [patent owner] on notice that” that a ground of unpatentability “would be used as a grounds for rejecting” certain claims that the Board ultimately relied on to find those claims unpatentable. *Id.* at 1348, 1352. So too here. The Institution Decision was clear about which claims were instituted for trial and which were not. It did not put Polaris on notice that claim 4 would be tried or found unpatentable.

This Court’s holding in *AC Technologies* confirms the Board’s error here. In *AC Technologies*, the Court rejected the patent owner’s contention that the Board acted improperly in granting the petitioner’s request for rehearing of the final written decision, when it instituted review on a ground previously denied institution, authorized the filing of additional briefing and evidence, and then rendered a final written decision on that ground. 912 F.3d at 1364. This Court found that “[n]o due process violation occurred” because, “after the Board decided to accept [the petitioner]’s rehearing request and consider Ground 3 [in light of *SAS*], it permitted [the patent owner] to take discovery and submit additional briefing and evidence on



that ground.” *Id.* at 1365. In contrast, the Board denied Polaris’s request in the present case for exactly that opportunity.

Second, the Board’s decision violated the America Invents Act and the Board’s IPR regulations. 35 U.S.C. § 316(a)(8) provides a patent owner the right to file “a response to the petition” “*after* an inter partes review has been instituted,” and under 37 C.F.R. § 42.120, “[a] patent owner may file a response to the petition *addressing any ground for unpatentability not already denied.*” Section 42.120, implementing 35 U.S.C. § 316(a)(8), leads to two conclusions. First, the rule prohibited Polaris from submitting affirmative evidence of patentability on claim 4 at the time it would have filed a POR because claim 4 was a “denied” ground for unpatentability. Second, once the Board decided to institute on claim 4 to correct its improper institution, Polaris was entitled to file a POR addressing claim 4 before the Board decided its patentability, but the Board denied Polaris that right.

Third, the Board has recognized the importance of additional briefing, if not reopening the record, to correct an IPR that proceeded on partial institution. *See Guidance on the Impact of SAS on AIA Trial Proceedings* (Apr. 26, 2018) (available at

[https://www.uspto.gov/sites/default/files/documents/guidance\\_on\\_the\\_impact\\_of\\_sas\\_on\\_aia\\_trial\\_proceedings\\_%20\(april\\_26,\\_2018\).pdf](https://www.uspto.gov/sites/default/files/documents/guidance_on_the_impact_of_sas_on_aia_trial_proceedings_%20(april_26,_2018).pdf)) (last visited May 24, 2019) (allowing Board to extend case beyond the 12-month statutory deadline “if required

to afford all parties a full and fair opportunity to be heard,” and informing panels that they “may take further action to manage the trial proceeding, including, for example, permitting additional . . . briefing”). For example, in *Broad Ocean Technologies, LLC v. NIDEC Motor Corporation*, IPR2015-01617, Paper 44 (P.T.A.B. Aug. 10, 2018), the Board concluded that due process required an opportunity for further briefing on claims denied institution initially but brought into the case by virtue of *SAS*. On remand from this Court, the Board ordered briefing on the scope and procedures it should follow. *Id.* at 4. The petitioner argued that the Board’s usual trial procedure, including briefing, discovery, and oral argument, was appropriate, while the patent owner argued that no additional briefing was necessary and that the record was sufficient to determine the patentability of the newly post-*SAS* instituted claims. *Id.* at 7-8. The Board agreed with the petitioner because “Patent Owner’s proposals would deny Petitioner a full opportunity to present its position in an instituted proceeding, particularly to avail itself of the opportunity for an oral hearing before the decision-maker.” *Id.* at 8. The same fundamental principle of due process applies here.

Here, Polaris expressly requested briefing on the patentability of claim 4. Appx573. Though Kingston argued no such briefing was necessary, it also stated that it “would not oppose additional briefing on it if the Board believed it warranted.” Appx552-553; Appx553 n.2. Due process required the Board to grant such briefing.

Finally, *SAS* does not stand for the proposition that a partially instituted petition can be fixed by instituting and summarily invalidating an excluded claim without trial. The Board's refusal to let Polaris address the patentability of claim 4 constitutes legal error requiring reversal.

**2. The Board's Reliance In The Revision Order On Its Analysis In The Final Written Decision Did Not Fix The Board's Partial Institution And Subsequent Denial Of Due Process**

The Board's reliance on the FWD could not substitute for the process to which Polaris was entitled for claim 4. First, Polaris was entitled to process on claim 4, regardless of whether the Board believed that its merits rose or fell with claim 9. Second, the briefing afforded to Polaris on claim 9 did not substitute for the full procedure Polaris would have had if the Board had instituted on claim 4 at the outset or granted full briefing on claim 4 when fixing the institution error. Finally, the Board's analysis in the FWD was marred by regulatory, statutory, and constitutional procedural error such that it could not reasonably have been extended to claim 4.

**a. Polaris's Due Process Rights Are Not Satisfied Just Because The Board Believes It Can Reach A Decision Without Affording Prior Notice And A Right To Respond**

"A proposed substitute claim by definition is different from the issued claims and, under 35 U.S.C. § 282(a), must be evaluated on its own terms." *Aqua Prods. v. Matal*, 872 F.3d 1290, 1349 n.6 (Fed. Cir. 2017) (Taranto, J.). The Board here

ignored that command and repeatedly assumed that Polaris should have been on notice that, despite non-institution on claim 4, claim 4 would be at issue in trial and that the Board would decide the subject matter of claim 4 without even instituting on that claim:

- “By proposing the substitute claim, Patent Owner placed at issue the patentability of the subject matter of claim 4.” Appx589.
- “[T]here can be no question that Patent Owner was on notice at least as early as its filing of the Motion to Amend that the subject matter of claim 4 would be an issue for trial.” *Id.*
- “It was Patent Owner’s actions that placed the subject matter of claim 4 at issue in the trial after we initially denied a review of that claim. ***Thus, it is Patent Owner that, in some sense, instituted a review of the subject matter of claim 4.***” Appx590.
- “The post-institution evidence and arguments pertaining to the subject matter of claim 4 came into the record as a direct result of Patent Owner reintroducing that subject matter into the trial, not as a unilateral attempt by Petitioner to shore up the Petition.” Appx591.
- “Although we did not identify explicitly claim 4 as unpatentable in the conclusion or order of the Final Written Decision, we, nonetheless, effectively ruled on the patentability of that claim.” *Id.*

The Board determined that Polaris was not entitled to file any briefing on ***claim 4*** because it had already received opportunities to defend ***claim 9, i.e.***, because “claim 4 and its subject matter have been discussed repeatedly throughout the trial.” Appx588-589. That is anathema to due process. The Board cannot decide how much process is due based on its view about the “correct” substantive result because the purpose of procedural due process ***is to enable determining*** what the correct

substantive result ought to be. *Cf. Fuentes v. Shevin*, 407 U.S. 67, 81 (1972) (explaining that “[t]he requirement of notice and an opportunity to be heard” “protect[s] against arbitrary deprivation of property” because “when a person has an opportunity to speak up in his own defense, and when the [government] must listen to what he has to say, substantively unfair and simply mistaken deprivations of property interests can be prevented.”). Here, the Board *presumed* the “correct” result in determining that Polaris did not need an opportunity to respond when it concluded that its analysis of proposed claim 9 applied equally to claim 4, and thus denied Polaris any opportunity to correct the Board’s conclusion.

Further, though Kingston argued that no briefing was necessary for newly instituted claim 4, it acknowledged that if the Board instituted on non-instituted claims 2 and 3,<sup>3</sup> Polaris “should be given the option to provide supplemental briefing on claims 2 and 3 (if [Polaris] desires it) as those claims were not in the Motion to Amend.” Appx553. But like claims 2 and 3, claim 4 was not in the MTA, or the trial, either. Accordingly, the Board was dutybound to permit Polaris to address the merits of claim 4.

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<sup>3</sup> Kingston unsuccessfully sought to limit the petition to remove claims 2 and 3 from consideration. Appx550-551, Appx585-586. Kingston did not appeal the Board’s determination in Polaris’s favor on claims 2 and 3.

**b. Polaris’s Right to a Reply In Support Of Its Motion To Amend Regarding Claim 9 Did Not Provide Adequate Process For Claim 4**

The then-operative rules for briefing and evidence on motions to amend were significantly different (and less protective of a patent owner) than the rules governing a response to an instituted claim.<sup>4</sup> The striking differences further demonstrate why Polaris had less than a complete opportunity to defend issued claim 4. Both procedurally and substantively, what a patent owner may submit in a MTA reply is more constrained than in a POR. A patent owner may “address[] any ground for unpatentability not already denied,” 37 C.F.R. § 42.120(a), in a POR that may include up to 14,000 words, the same length as the petition itself, and roughly 56 double-spaced pages. 37 C.F.R. §§ 42.24(a)(1)(i)&(b)(2).

By contrast, a patent owner’s reply in support of a motion to amend is limited to 12 pages, 37 C.F.R. § 42.24(c)(3), and may “only respond to arguments raised in the corresponding opposition.” 37 C.F.R. § 42.23(b). In fact, “a reply that raises a

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<sup>4</sup> The Board has since implemented a pilot program that changes the IPR claim amendment process to address a need for “an improved amendment practice in AIA trials in a manner that is fair and balanced for all parties and stakeholders.” *Request for Comments on Motion To Amend Practice and Procedures in Trial Proceedings Under the America Invents Act Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 54320 (Oct. 29, 2018). The new process provides enhanced opportunities for the parties to offer positions during a motion to amend, and to receive guidance on proposed amendments before the Board reaches a final written decision. *See Notice Regarding a New Pilot Program Concerning Motion To Amend Practice and Procedures in Trial Proceedings Under the America Invents Act Before the Patent Trial and Appeal Board*, 84 Fed. Reg. 9497 (Mar. 15, 2019).

new issue or belatedly presents evidence will not be considered,” and “[e]xamples of indications that a new issue has been raised in a reply include new evidence necessary to make out a prima facie case for the patentability or unpatentability of an original or proposed substitute claim, and new evidence that could have been presented in a prior filing.” *2012 Office Patent Trial Practice Guide*, 77 Fed. Reg. 48756 at 48767 (Aug. 14, 2012).

Thus, when Polaris understood, correctly, that claim 4 was not instituted, Polaris briefed the remaining issues within the appropriate page limits. Polaris was not permitted to submit with its reply any evidence that would “make out a *prima facie* case for the patentability . . . of an original or proposed substitute claim,” such as objective indicia of non-obviousness, or a full defense of patentability with expert testimony unless that testimony was directly responsive to Kingston. *See id.*; e.g., *The Scotts Co. LLC v. Encap, LLC*, IPR2013-00110, Paper 79 at 7-8 (P.T.A.B. June 24, 2014) (excluding evidence submitted with reply in support of motion to amend). Polaris told the Board that the record on the MTA was less developed than the record Polaris would have created to resolve patentability of claim 4. Appx2348, Appx2356, Appx2367. Nonetheless, the Board deemed it appropriate to resolve the merits of claim 4 on the inadequate record before it.

As just one example of how the more limited briefing prejudiced Polaris, in its preliminary response to the Serial Petition, Polaris argued that, as with the

Petition here, Kingston failed to demonstrate that a POSA would expect the chip configuration of Simpson to be successfully modified to fit within the height limitations. *See Kingston*, IPR2017-00974, Paper 6, at 28-33. Though Kingston offered declarations from Dr. Subramanian that it argued resolved the issue, due to the constraints of a reply in support of a motion to amend, Polaris could not have addressed this in light of the other errors it rebutted. *See Appx288-291*. But in the FWD, *without detailing why*, the Board concluded that Kingston had shown that “one of ordinary skill in the art would have been able to apply Simpson’s chip layout on a circuit board having the claimed width and height dimensions.” *Appx501*. For that proposition, the Board cites Kingston’s new evidence and MTA Opposition. *Id.* Accordingly, Polaris did not have the same opportunity to address these contentions as if it had been permitted to file a POR on claim 4. This shows why the findings on proposed claim 9 should not have automatically applied to claim 4—and certainly not without even hearing from Polaris first. When the Board put the subject matter of claim 4 into the case, it deprived Polaris of its opportunity to address the underlying merits in full, thereby committing legal error and violating due process.



**c. The Board Improperly Treated The Final Written Decision As Precluding Additional Arguments For The Patentability Of Claim 4**

**(1) The Board Improperly Relied On Its Analysis In The Final Written Decision Of Claim 1 When Finding Claim 4 Unpatentable Because It Should Have Cancelled Claim 1 Without Determining Its Patentability**

As part of its reasoning finding claim 4 unpatentable, the Board relied on its prior determination that “Petitioner had proven the unpatentability of independent claim 1,” a conclusion which in turn relied on the fact that “Patent Owner opted to not file a Patent Owner Response.” Appx588 n.2. Yet the Board never should have decided the patentability of claim 1 because Polaris moved to amend the patent noncontingently to remove that claim. As *SAS* explained, certain “claims challenged ‘in the petition’ will not always survive to the end of the case” because “some may drop out thanks to the patent owner’s actions,” such as when a patent owner “move[s] to ‘[c]ancel [a] challenged patent claim’ during the course of an inter partes review, effectively conceding one part of a petitioner’s challenge.” *SAS Inst., Inc.*, 138 S. Ct. at 1357. Thus, claim 1 should have been removed from the substantive inquiry of the IPR completely. The Board’s findings about claim 1, and its application of those findings to claim 4, were improper.

The MTA sought two distinct forms of relief: (1) cancellation of instituted claims 1 and 5-8, and (2) substitution of proposed claim 9 for cancelled claim 8.

Appx228; *see* 35 U.S.C. § 316(d)(1) (“[T]he patent owner may file 1 motion to amend the patent in 1 *or more* of the following ways . . .”). Under a section marked “Claim Listing,” Polaris stated that claims 1 and 5-8 were “[t]o be canceled.” Appx229. Nothing in the MTA hinted at any sort of contingent treatment—as the Board found, Appx487—and Polaris was thus entitled to rely on the Board’s order stating that “[a] request to cancel claims will not be regarded as contingent” by asserting its non-contingent motion and choosing not to file a POR to address the claims that it had sought to voluntarily cancel. Appx217-218. Kingston too acknowledged that “*patent owner has unconditionally cancelled* all the instituted claims in the ‘414 patent leaving only their substitute amended claim 9 remaining.” Appx440. In the FWD, the Board itself expressly acknowledged that Polaris’s motion to cancel was noncontingent:

By not filing a response to the Petition, and requesting cancellation of claims 1 and 5–8 *not based on any apparent contingency*, Patent Owner has *waived any argument* that the challenged claims for which we instituted review—claims 1 and 5–8 of the ‘414 patent—would not have been obvious.

Appx487. The Board had no reason not to cancel the claims, as was its practice whenever a cancellation request left other claims remaining for trial.<sup>5</sup> Yet, the Board

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<sup>5</sup> *See, e.g., Merck v. Mayne*, IPR2016-01186, Paper 61 at 2 (P.T.A.B. Aug. 30, 2017) (“We do not construe the request for cancellation of claims [in the motion to amend] . . . to be a request for adverse judgment as claims . . . remain under

ignored the MTA's cancellation request, found the instituted claims unpatentable, and concluded that Polaris "waived" any argument to the contrary. *Id.*

Despite expressly acknowledging that Polaris's motion to cancel was noncontingent in the FWD, on rehearing, for the first time, the Board deemed the record to be "ambiguous" and blamed Polaris for "not identify[ing] where it previously stated, argued, represented, or requested that the cancelation portion of the Motion to Amend be treated as 'noncontingent' or as severable from the portion of the motion seeking to substitute a new claim." Appx534.

The Board had no justification for denying Polaris's cancellation. It cited no rule requiring Polaris to expressly state that its cancellation request was noncontingent, and the Board has previously found claim cancellations obviate the need to decide the underlying dispute about the patentability of the claims. *E.g.*, *Semiconductor Components Indus., LLC v. Power Integrations, Inc.*, IPR2016-01600, Paper 35 at 10 (P.T.A.B. Feb. 14, 2018); *MotivePower, Inc. v. Cutsforth, Inc.*, IPR2013-00268, Paper 31 at 2 (P.T.A.B. Oct. 30, 2014); *Intellectual Ventures Mgmt.*,

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challenge in the proceeding. 37 C.F.R. § 42.73 (b)(2)."); *Alcohol Monitoring Sys., Inc. v. Soberlink, Inc.*, IPR2015-00556, Paper 28 at 6 (P.T.A.B. May 3, 2016); *Facebook, Inc. v. EveryMD LLC*, IPR2014-00242, Paper 31 at 3 (P.T.A.B. May 12, 2015); *Riverbed Tech., Inc. v. Silver Peak Sys., Inc.*, IPR2013-00403, Paper 33 at 11 (P.T.A.B. Dec. 30, 2014); *Riverbed Tech., Inc. v. Silver Peak Sys., Inc.*, IPR2013-00402, Paper 35 at 10-11 (P.T.A.B. Dec. 30, 2014); *Syntroleum Corp. v. Nestle Oil OYJ*, IPR2013-00178, Paper 63 at 21 (P.T.A.B. Aug. 29, 2014); *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, IPR2013-00128, Paper 92 at 4 (P.T.A.B. Jul. 25, 2014).

*LLC v. Xilinx, Inc.*, IPR2012-00020, Paper 34 at 6 n.2 (P.T.A.B Feb. 11, 2014). It was not Polaris's burden to restate the Board's pre-motion guidance that "[a] request to cancel claims will not be regarded as contingent." Appx218. Thus, the Board should have cancelled the claims and never have made a substantive patentability determination on claim 1.

Moreover, ignoring Polaris's cancellation request denied Polaris its statutory right to move to amend to cancel claims under 35 U.S.C. § 316(d). The Board tried to justify this deprivation by arguing that Polaris might have "strategically tied together the proposed substitute claim to the cancelation of all the instituted claims in an attempt to avoid its actions being construed as a request for adverse judgment." Appx536 n.5. But patent owners are never required to request adverse judgment. If the Board's response of overlooking a patent owner's request for cancellation were permissible, the Board could always deny a cancellation request and then find claims unpatentable based on a lack of substantive response from the patent owner. The only way a patent owner could protect itself would be to endure the expense and time of preparing both a POR and a motion to amend. That option defeats a significant purpose of a motion to amend: to avoid patentability disputes for claims that the patent owner is willing to cancel in order to winnow the issues in dispute for trial.

The Board should have cancelled claim 1 based on the MTA. It should not have reached patentability, and certainly not without giving Polaris an opportunity to defend claim 1 on the merits—an opportunity Polaris did not actually have because its noncontingent cancellation relieved the Board of the obligation to consider the substance of the instituted claims. Because the claim 1 patentability analysis was wrongly conducted, the claim 4 analysis that depended on it is equally improper.

**(2) The Board Improperly Relied On Its Analysis Of Proposed Claim 9 When Finding Claim 4 Unpatentable.**

**(a) The Board Unfairly Considered The Subject Matter Of Claim 1 In Its Analysis Of Proposed Claim 9, Which As Shown Above, It Used To Find Claim 4 Unpatentable.**

As explained above, the Board should never have reached the patentability of claim 1, which the Board then used as part of its basis for finding claim 4 unpatentable. The Board *also* used its analysis of claim 1 to find claim 9 unpatentable, and in turn used its finding of claim 9 unpatentable to find claim 4 unpatentable. Thus, the Board’s reliance on the claim 9 analysis was improper as well, for the same reasons that its reliance on the claim 1 analysis was wrong.

Addressing the MTA, the Board started its reasoning on claim 9 by tying the proposed claim to the “limitations of independent claim 1, which define the printed

circuit board configuration, with the addition of the circuit board width of dependent claim 8 and the addition of the circuit board height of dependent claim 4.” Appx499. Rather than analyze claim 1 anew for the MTA, the Board relied on its prior discussion of “the limitations of independent claim 1 above in the context of the challenge thereto in the Petition.” *Id.* Thus, because the Board should not have reached this substantive matter of claim 1 in its initial analysis because the claim was cancelled, it should not have applied that analysis to claim 9.

The Board then relied on its conclusions about claim 9 to find claim 4 unpatentable. The Board never independently analyzed the merits of claim 4: it just identified the claim elements, explained why it believed it could decide the patentability of claim 4 without hearing from Polaris, then concluded that it had already “effectively ruled on the patentability of” claim 4 because it “necessarily analyzed the patentability of the subject matter of dependent claim 4, which as mentioned, is broader in scope than that of proposed substitute claim 9.” Appx591; *see* Appx588 (claim elements), Appx589-591 (justifying decision not to hear further from Polaris). But a “proposed substitute claim by definition is different from the issued claims and, under 35 U.S.C. § 282(a), must be evaluated on its own terms.” *Aqua Prods.*, 872 F.3d at 1349 n.6 (Taranto, J.). Yet, the Revision Order’s determination of claim 9 rested, ultimately, on the Board’s improper determination on claim 1.

**(b) The Board's Consideration Of Claim 9 Was Negatively Affected By The Initial Failure To Institute On Claim 4.**

There is another reason that the Board's partial institution affected the Board's consideration of claim 9, and by extension, claim 4. Had the Board instituted on claim 4 at the inception, Polaris could have filed a POR addressing the patentability of claim 4 and included any affirmative evidence that Polaris might have offered. Then, the Board would have presumably considered all record evidence when resolving the MTA and reaching a decision on proposed claim 9. Accordingly, the Board's failure to institute on claim 4 initially, combined with its violation of Polaris's due process right to submit evidence on claim 4 after institution, led to the improper conclusions on claim 9.

**3. The Deprivation Of Polaris's Right To Respond On Claim 4 Also Prejudiced Polaris's Rights With Respect To Claim 9**

The Board's failure to grant Polaris a POR on claim 4 as due process required also tainted the evaluation of claim 9. Polaris argued that the Board should not have considered the patentability of the claim 4 subject matter because Kingston's showing at the institution phase was insufficient. Despite that, the Board decided to substantively consider whether the height limitation of claim 4, as introduced into claim 9, was patentable. In so doing, the Board had an incomplete record on the subject matter of claim 4 before it because Polaris could not file a POR with the appropriate evidence, instead rightly relying on the Board's decision excluding

claim 4 from trial. Thus, the decision to partially institute not only affected Polaris's rights with respect to claim 4, it also prejudiced Polaris's rights with respect to claim 9.

As discussed in detail below, *see infra* at Part V.C., this was particularly problematic because the Board allowed Kingston to use the MTA as a vehicle to introduce into the record evidence and arguments that it could not otherwise have presented because the evidence targeted issues that Kingston tried, but failed, to address in the Petition. Nor did Polaris have *notice* that the subject matter of claim 4 would be at issue in the motion to amend. Kingston should have been limited to raising, and the Board should have only considered, evidence and argument only targeting *new* issues raised by the MTA—and *not* the height limitation of claim 4 that the Board had already found did not raise a reasonable likelihood of unpatentability based on the Petition.

**4. The Final Written Decision Of Obviousness Fails On The Merits And Highlights The Importance Of The Board's Due Process Violations**

The Board's due process violations *per se* require vacatur. But the effect of the due process violation is evident from the FWD's analysis on claim 9, which cannot stand on its own and does not support the Board's decision on the merits of either claim. For example, on motivation to combine, the Board found persuasive Kingston's "reasoning based on the ordinary artisan's recognition of a need to have



shorter memory boards and recognition that Simpson’s layout was *one possible choice* applicable to low profile circuit boards.” Appx502-503. But the Board did not explain how that “design need” would lead a POSA to have picked Simpson’s layout over countless other possible layouts, as it was required to do. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 405 (2007) (identifying a combination of “design need or market pressure to solve a problem” with “a finite number of identified, predictable solutions” as a means to show obviousness). Had Polaris been able to submit a POR on claim 4, it could have demonstrated, for example, the extent to which chip design is not confined to a finite number of identified, predictable solutions—a finding that was required to support the Board’s apparent reasoning but was missing from the Board’s decisions. The Board’s finding that the claimed arrangement was “one possible choice” does not and cannot support a conclusion of obviousness as a matter of law.

As for reasonable expectation of success, the Board concluded that Kingston “persuasively show[ed] that one of ordinary skill in the art would have been able to apply Simpson’s chip layout on a circuit board having the claimed width and height dimensions.” Appx501. Polaris never had the opportunity to explain with supporting evidence in a POR how, for example, even assuming Kingston had successfully shown that the references were factually combinable, Kingston did not show with non-conclusory evidence that a POSA would have predicted the combination of

Simpson and Intel Specification to be successful. *Id.* Thus, the effects of Polaris’s denied opportunity to address claim 4 can be seen in the opinion itself.

Even with the improper record the Board relied upon, the Board’s decision fails to articulate a sustainable basis of obviousness and must be vacated.

**C. The Board Improperly Considered Evidence And Argument First Submitted In The MTA Opposition That Kingston Could Have Submitted With The Petition**

Having filed a petition challenging claim 4, Kingston was required to put in the Petition all necessary evidence to make its *prima facie* showing of unpatentability on claim 4. The Board found that Kingston had failed to meet its showing, both here and in a separate serial petition. Polaris had no notice that the Board would change course and consider challenges to the same subject matter based on new evidence in the MTA Opposition. Yet the Board credited evidence presented for the first time in the MTA Opposition—evidence that Kingston introduced to rebut the Board’s institution stage findings on claims exclude from the scope of trial. This was an improper legal error that affected both the denial of Polaris’s MTA and the Board’s later finding of unpatentability on claim 4.

**1. The Board Improperly Relied On The Newly Submitted Declarations And Art To Find Claim 9 Unpatentable**

In its institution decision, the Board concluded that Kingston “ha[d] not explained sufficiently how or why a person of ordinary skill in the art would have modified Simpson to achieve” the height limitation of claim 4, Appx167, and

rejected Kingston's argument that the "limitations would have been an 'obvious design choice'" because Kingston had not "explain[ed] persuasively how and/or why a person of ordinary skill in the art would have made the proposed modifications to Simpson in view of the teachings of the Intel Specification." Appx168. The Board reaffirmed that conclusion when it denied Kingston's request for rehearing on non-institution of claim 4. Appx212-214. And when denying institution on the Serial Petition, the Board *again* reiterated that Kingston had not shown that the memory chips disclosed in the prior art would fit on a printed circuit board with the height dimension of claim 4. IPR2017-00974, Paper 8, at 13-14 (P.T.A.B. Aug. 14, 2017). Yet ultimately, the Board found unpatentable the same height limitation that Kingston's petitions had twice failed to demonstrate was likely to be unpatentable based heavily on evidence that Kingston offered in opposition to the MTA to which, under the Board's practice at the time, Polaris had no ability to submit responsive evidence. That was legal error.

**a. Kingston Was Only Permitted To Submit An Opposition That Responded To A New Patentability Proposition Not Placed At Issue In Its Petition**

"The expedited nature of IPRs bring [sic] with it an obligation for petitioners to make their case in their petition to institute." *Intelligent Bio-Systems*, 821 F.3d at 1369; *see* 35 U.S.C. § 312(a)(3) (requiring petition to identify "the evidence that supports the grounds for the challenge to each claim"). Accordingly, consistent with

Judge Taranto's opinion in *Aqua Products* and the Patent Office's 2012 Trial Practice Guide, a petitioner may not introduce evidence or arguments during the IPR to fill the gaps in its *prima facie* case of obviousness. See *Aqua Prods.*, 872 F.3d at 1349 n.6 ("Additional prior art may be needed to evaluate a new claim with a new element: if that element was absent from the claims on which the IPR was instituted, the petitioner may not have initially introduced prior art that addressed the element."); *2012 Office Patent Trial Practice Guide*, 77 Fed. Reg. 48,756, 48,767 (Aug. 14, 2012) ("Petitioner Opposition to Amendment . . . Petitioners may respond **to new issues arising from proposed substitute claims** including evidence responsive to the amendment. . . . This includes the submission of new expert declarations that are directed to the proposed substitute claims."). The Board originally defined a "new issue" in the context of an improper reply to include "new evidence necessary to make out a *prima facie* case for the patentability or unpatentability of an original or proposed substitute claim, and new evidence that could have been presented in a prior filing," 77 Fed. Reg. at 48,767, and now includes "new theories or arguments necessary to make out petitioner's case-in-chief for the unpatentability of an original or proposed substitute claim, such as a newly raised rationale to combine the prior art references that was not expressed in the petition," *PTAB Trial Practice Guide August 2018 Update* (available at [https://www.uspto.gov/sites/default/files/documents/2018\\_Revised\\_Trial\\_Practice](https://www.uspto.gov/sites/default/files/documents/2018_Revised_Trial_Practice)

\_Guide.pdf) (last visited May 24, 2019); *see, e.g., The Scotts Co. LLC*, IPR2013-00110, Paper 79 at 7-8 (excluding evidence submitted with reply in support of motion to amend). Thus, an opposition to a motion to amend may not include new ways to demonstrate *prima facie* unpatentability.

This rule makes sense for many reasons. *First*, Kingston already had a full opportunity to build its case-in-chief against the height limitation, and the Board found its submission inadequate. *See* Appx166-167. Consistent with the obligation to provide a patent owner with notice, a petitioner should not be able to submit on a motion to amend what it would not have been permitted to submit in a Petitioner's Reply. *See, e.g., Intelligent Bio-Systems, Inc.*, 821 F.3d at 1369 (affirming Board's decision to exclude evidence supporting new motivation-to-combine theory for first time in reply).

*Second*, under the rules at the time, Polaris could not submit affirmative evidence in its reply in support of its MTA. 37 C.F.R. § 42.23(b) ("All arguments for the relief requested in a motion must be made in the motion. A reply may only respond to arguments raised in the corresponding opposition . . . or patent owner response."); *e.g., The Scotts Co. LLC*, IPR2013-00110, Paper 79 at 7-8 (granting motion to strike expert declaration where "it is clear that the majority of the Declaration is in support of [the patent owner's] Motion to Amend rather than in rebuttal to [the petitioner's] Opposition to [Patent Owner's] Motion to Amnd [sic]").

*Third*, prohibiting petitioners from submitting evidence in opposition to a motion to amend on issues that the petition squarely presented is “consistent with other PTO-based proceedings,” including “pre-AIA *inter partes* reexamination proceedings.” See *Aqua Prods.*, 872 F.3d at 1305 n.6 (O’Malley opinion); *id.* at 1310 (noting that IPR amendment procedure “functions as a process for refining and limiting patent scope, similar to the *inter partes* reexamination process.”); *Belkin Int’l, Inc. v. Kappos*, 696 F.3d 1379, 1383 (Fed. Cir. 2012) (explaining that “the scope of reexamination” “may not include other prior art than what constituted the basis of the Director’s determination of a substantial question of patentability”); *Airbus S.A.S. v. Firepass Corp.*, 793 F.3d 1376, 1380 (Fed. Cir. 2015) (stating that the Board “limits the [requester]’s ability to cite additional prior art against a newly-added or amended claim with respect to limitations for which the prior art has already been considered either during original prosecution or in the request for reexamination.”).

*Fourth*, a rule prohibiting the Board from considering already petitioned-against limitations is consistent with the Board’s decision in *Amerigen Pharmaceuticals Ltd. v. Shire LLC*, IPR2015-02009, Paper 38 (P.T.A.B. Mar. 31, 2017) (Appx2147-2154). There, after the Board only partially instituted, the patent owner moved to amend in response to the petition. *Id.*, Paper 14 at 1 (P.T.A.B. Jul. 28, 2016) (Appx2098). The patent owner asked to cancel all instituted claims and

add a substitute claim that confined its limitations only to limitations found in unchallenged or non-instituted claims. *Id.* The question was whether the patent owner had to demonstrate the patentability of the entire claim. The Board “agree[d] with Patent Owner that ‘there is no requirement for [the patent owner] to prove, after the Institution Decision, that original non-amended claims are patentable over all potential prior art, especially non-instituted claims.’” *Id.* at 5 (Appx2152) (alteration marks omitted). The Board based its decision significantly on the fact that the substitute claim’s limitations were not newly drafted limitations, but, instead, included only limitations of non-instituted or non-challenged claims. *Id.* at 4-5 (Appx2150-2151).

*Fifth*, without such a rule, motions to amend would not serve their intended statutory purpose of narrowing issues for trial because such a motion would reopen any already-addressed issue of patentability in the proceeding. *See Aqua Prods.*, 872 F.3d at 1299 (explaining that “Congress saw the amendment process in IPRs as analogous to narrowing reissues.”).

*Finally*, a contrary rule would encourage precisely the gamesmanship that Kingston engaged in here. Kingston submitted a petition challenging claim 4, and the Board found it insufficient. Kingston then submitted a second, serial petition, and the Board found that insufficient as well. So Kingston instead introduced the evidence through an improper means—its MTA Opposition—and specifically

targeted it to respond to the Board’s findings of deficiencies in the Petitions. But an opposition to a motion to amend ought not be a method to introduce evidence that a petitioner could not introduce through a reply.

**b. The Board Improperly Relied On Kingston’s MTA Opposition.**

Here, there was no “new claim with a new element”; only a new claim with an old element. *Aqua Prods.*, 872 F.3d at 1349 n.6 (Taranto, J.). The height limitation that Polaris proposed for new claim 9, as narrowing claim 8, was a limitation that the Board had already concluded the combination of Simpson and Intel Specification failed to render obvious on the record that Kingston had created at institution. *See, e.g.*, Appx168, Appx588. At the institution phase, the Board determined that Kingston had failed to demonstrate a reasonable likelihood that claim 4 was unpatentable for at least two reasons: because “Petitioner has not explained sufficiently how or why a person of ordinary skill in the art would have modified Simpson to achieve” the height limitation of claim 4, Appx167, and because “Petitioner continue[d] to rely solely on its argument that the limitations would have been an ‘obvious design choice’ without explaining persuasively how and/or why a [POSA] would have made the proposed modifications to Simpson in view of the teachings of the Intel Specification,” Appx168.

The Board relied in the FWD on Kingston’s newly submitted evidence, without the benefit of a Polaris POR, to find these failures of proof cured. In



particular, the Board relied on the new evidence to find a motivation to combine Simpson with Intel Specification:

Petitioner persuasively argues and presents evidentiary support that there was a recognized market need for ‘low profile’ memory modules, thus providing a reason for one of ordinary skill to target the claimed height range when designing a memory module. MTA Opp. 13-14 (*citing Ex. 1016 ¶¶ 50-52, 56*); see *Ex. 1017 ¶¶ 27-28*; *Ex. 1006 ¶ 39, id. at ¶ 28*<sup>6</sup> (the Karabatsos reference disclosing a ‘low profile DIMM’ circuit board ‘having a height of approximately 1.2 inches, and a width of approximately 5.25 inches’).

Appx500. The Board itself recognized that this was a key issue at institution; after all, it explained that “a trial was not originally instituted as to claim 4 primarily because we determined Petitioner had not provided in the Petition an adequate articulation of a reason to combine or modify the references.” Appx588. Similarly, for whether the chip layout disclosed in Simpson would fit on the circuit board described in Intel Specification, the Board relied on evidence submitted with the MTA Opposition, including a newly submitted Subramanian declaration, to conclude that “Petitioner persuasively shows that one of ordinary skill in the art would have been able to apply Simpson’s chip layout on a circuit board having the claimed width and height dimensions.” Appx501 (citing Appx1964-1973). More

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<sup>6</sup> The Board’s citation to Exhibit 1006 ¶ 28 appears to have been mistakenly ascribed to Ex. 1006, Dr. Subramanian’s original declaration, which says nothing about Karabatsos.

generally, the Board repeatedly relied on Kingston's arguments opposing the MTA and the underlying supplemental declarations to support its conclusions. *E.g.*, Appx499, Appx500, Appx501, Appx503.

At most, Kingston should have been permitted to introduce evidence in the MTA Opposition on the only new feature: whether the *combination* of the height and length restrictions was obvious. *See Veritas Techs. LLC v. Veeam Software Corp.*, 835 F.3d 1406, 1414 (Fed. Cir. 2016) (vacating denial of IPR motion to amend) ("it is only the combination [of elements] that was the 'new feature,' a scenario recognized in a long line of Supreme Court and Federal Circuit cases"). That is far different than presenting new evidence on whether a POSA would have been motivated to combine the prior art references to use the layout supposedly disclosed by Simpson with a printed circuit board of the height allegedly disclosed in Intel Specification to meet the key additional limitation of the non-instituted claim 4. On this question, Kingston already had multiple opportunities to prove its case—first, in the Petition, and then, in the Serial Petition. It failed, and having done so, should not have been permitted to submit those materials for the Board's consideration under the guise of the MTA Opposition. Thus, the Board committed legal error by considering the untimely evidence.

**2. Because The Board Relied On The Unpatentability Of Claim 9 When Finding Claim 4 Unpatentable, The Board’s Reliance On The Newly Submitted Evidence To Find Claim 4 Unpatentable Was Improper.**

As already shown, the Board’s decision to find claim 4 unpatentable was directly linked to its improper analysis of proposed substitute claim 9, including Polaris’s inability to submit, at any time, a POR addressing the subject matter of claim 4 (and thus also, claim 9). Thus, because the Board should not have considered the newly submitted evidence to find proposed claim 9 unpatentable, its determination about the patentability of claim 4—based on its conclusion regarding claim 9—was wrong as well.

**D. The Board Members Could Not Constitutionally Issue A Final Agency Decision Eliminating Patent Rights Without Having Been Appointed By The President And Confirmed By The Senate**

This Court should set aside the Board’s decision because the PTAB judges’ exercise of authority exceeded the powers that the Constitution allows to be vested in them. Under the Appointments Clause of the Constitution, U.S. Const. art. II, § 2, cl. 2, only “principal officers” of the United States appointed by the President and confirmed by the Senate may “exercis[e] significant authority pursuant to the laws of the United States.” *Buckley v. Valeo*, 424 U.S. 1, 125-126 (1976) (per curiam). The Board members in this case, on behalf of the USPTO and the federal government, entered a final decision that Polaris’s issued claims are unpatentable and subject to mandatory cancellation—without meaningful Executive Branch supervision or

review. 35 U.S.C. §§ 311(a), 316(c), 318(a)-(b). But unlike administrative patent judges (“APJs”) before 1975 who were nominated and confirmed under the Appointments Clause, Maeve P. Carey, Cong. Res. Serv., R41872 at n.22 (2012), and would have been empowered to make such decisions for purposes of the Clause, the PTAB judges are instead “appointed by the Secretary[ of Commerce], in consultation with the Director” of the USPTO. 35 U.S.C. § 6(a) (2008). As explained below, because PTAB judges are “principal” officers but were not nominated by the President and by and with the advice and consent of the Senate, their exercise of authority to eliminate patent owners’ rights violates the Appointments Clause.

**1. PTAB Judges Who Decide IPRs Are “Officers” Of The United States Under The Constitution’s Appointments Clause**

PTAB judges who decide IPRs are “Officers” under the Appointments Clause because they occupy a “‘continuing’ position established by law” and “exercis[e] significant authority pursuant to the laws of the United States.” *Lucia v. SEC*, 138 S. Ct. 2044, 2051 (2018) (internal citations omitted); *see also Freytag v. Commissioner*, 501 U.S. 868, 881 (1991). and *Lucia v. SEC*, 138 S. Ct. 2044 (2018). Their positions are non-temporary offices with duties, salaries and means of appointment as established by law. 35 U.S.C. §§ 6 (specifying duties), 3(b)(6) (establishing salary), 6(a) (creating position and specifying means of appointment). They also exercise significant authority pursuant to the laws of the United States. 35 U.S.C. § 6. Like

the officers in *Freytag* and *Lucia*, PTAB judges take testimony (37 C.F.R. § 42.53), conduct trials (35 U.S.C. §§ 316(a)(5), 326(a)(5)), compel compliance with discovery orders (37 C.F.R. § 42.52), apply federal rules of evidence (37 C.F.R. § 42.62), rule on admissibility of evidence (37 C.F.R. § 42.64), conduct discovery (37 C.F.R. § 42.51), and can impose sanctions such as judgment in a trial or dismissal of a petition. 37 C.F.R. § 42.12(b)(8). Perhaps most importantly, PTAB judges have the power to render final decisions on behalf of the United States that extinguish the rights of patent owners, without review by the Director or the Secretary of Commerce. 35 U.S.C. §§ 318, 328; *Compare Lucia*, 138 S. Ct. at 2053-54, with *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2137 (2016).

**2. Because PTAB Judges Issue Final IPR Decisions Eliminating Patent Rights, They Must Be “Principal Officers”**

PTAB judges, wielding the power to issue final written decisions, act as principal officers. The difference between a “principal” and “inferior” officer affects how the officer must be appointed: though by default both must be appointed by the President, by and with the advice and consent of the Senate, the appointments of “inferior officers” may be vested by law “in the President alone, in the courts of law, or in the heads of departments.” U.S. Const. art. II, § 2, Cls. 1, 2; *see also Buckley*, 424 U.S. at 125 (citing *United States v. Germaine*, 99 U.S. 508, 509-510 (1879)); *id.* at 132. As discussed below, PTAB judges exercise significant independent

discretion, issue final decisions conclusive upon patent rights without direction and supervision and with only limited and deferential review and are not removable from the competitive service except for cause. Collectively, these characteristics demonstrate that PTAB judges act as principal officers.

PTAB judges are not “inferior” officers because no other agency or Executive Branch officer can review or overrule their decisions. In a precedential decision that the Department of Justice’s Office of Legal Counsel adopted and characterized in 1978 as “generally accepted,” *United States Attorneys—Suggested Appointment Power of the Attorney General—Constitutional Law*, 2 Op. O.L.C. 58, 58-59 (1978), the Court of Claims held that whether an officer is an “inferior” officer under the Clause depends not on whether he is “petty or unimportant,” but whether he is “subordinate or inferior to those officers in whom respectively the power of appointment may be vested—the President, the courts of law, and the heads of departments,” in other words, “one who is bound to obey another.” *Collin’s Case*, 14 Ct. Cl. 568, 574 (1878). Similarly, the D.C. Circuit has also found officers are principal officers where their authorizing statutes do not “provide any procedure by which the [officer’s] decision is reviewable” so that the result of the officer’s decision is “[a] final agency action.” *Ass’n of Am. RR. v. United States DOT*, 821 F.3d 19, 39 (D.C. Cir. 2016); *reh’g denied mem.* (D.C. Cir. 2016) (per curiam).

As set forth in *Cuozzo*, the Board’s “decision to cancel a patent ... has the same effect as a district court’s determination of a patent’s invalidity.” *Cuozzo*, 136 S. Ct. at 2143. By statute, its decision is final. 35 U.S.C. §§ 314(d), 319. PTAB judges’ unfettered discretion is even more apparent in the case of IPR institution where their initial decision to institute IPR is final **and nonappealable** (i.e., unreviewable by even this Court). *Cuozzo*, 136 S. Ct. at 2137-38; 35 U.S.C. § 314(d). Once they issue a final decision, “the Director *must* ‘issue and publish a certificate’,” even if he disagrees. *Oil States Energy Services, LLC v. Greene’s Energy Group, LLC*, 138 S. Ct. 1365, 1372 (2018); *see also* 35 U.S.C. § 318(b).

The Director’s lack of control over the PTAB final written decisions is not changed by his authority to issue rules and regulations related to IPR proceedings. This power gives the Director no authority to directly review or change the decisions of the PTAB judges, and so the judges maintain broad discretion without supervision. This is similar to *Intercollegiate Broad Systems, Inc. v. Copyright Royalty Board*, 684 F.3d 1332, 1338-39 (D.C. Cir. 2012) where Copyright Royalty Judges were found to be principal officers even though the Librarian and Register<sup>7</sup> had numerous responsibilities including approving regulations, interpreting copyright laws, providing written opinions on novel questions of law, and correcting the judges’

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<sup>7</sup> The Librarian is appointed by the President with advice and consent of the Senate and the Register is appointed by the Librarian and acts at his discretion. *Intercollegiate*, 684 F.3d at 1338.

legal errors. For example, the Director’s ability to designate precedential decisions and establish a Precedential Opinion Panel still does not allow him to directly change the final decision and the PTAB judges are still responsible for applying any precedential decisions to future cases. *See* Patent Trial and Appeal Board Standard Operating Procedure 2 (SOP2) at 1-2, <https://www.uspto.gov/sites/default/files/documents/SOP2%20R10%20FINAL.pdf> (last visited May 24, 2019). The Director’s membership on the PTAB also does not allow him to directly review or change a decision because the Director cannot unilaterally make unpatentability decisions—at least three PTAB members must hear each case. 35 U.S.C. § 6(c). Similarly, the rehearing procedures also do not vest power with the Director since the PTAB must still hear the case and ultimately make a decision on patentability, not the Director. *Id.*; 37 C.F.R. § 42.71(a), (d).

Furthermore, the Director’s ability to intervene for the first time on appeal to this Court only proves the point that the Director does not control the PTAB judges, as he may attempt to exert “influence” over a final decision only after the decision is appealed, and even that “influence” is limited. *See* 35 U.S.C. § 143. That PTAB decisions are final and appealable directly to this Court without further agency review supports PTAB judges being principal officers. *Intercollegiate*, 684 F.3d at 1340 (principal officers’ final decisions “subject to reversal or change only when challenged in an Article III court”); *see also Free Enters. Fund v. Accounting*



*Oversight Bd.*, 537 F.3d 667, 672 (D. C. Cir. 2008) (holding that the Public Company Accounting Oversight Board are inferior officers because, among other things, the subject decisions underwent plenary review by the SEC, which could “enhance, modify, cancel, reduce, or require the emission of” the decision); *Edmond v. United States*, 520 U.S. 651, 664-65 (1997) (concluding that the judges of the Coast Guard Court of Criminal Appeals were inferior officers, the Court finding it “significant” that the judges had “no power to render a final decision on behalf of the United States unless permitted to do so by other executive officers”). Even the Director’s control over PTAB decisions before this Court is limited, as this Court has discretion to reject the Director’s request. *See SKF USA, Inc. v. United States*, 254 F.3d 1022, 1029 (Fed. Cir. 2001). Ultimately, any role the Director has on appeal is irrelevant as the Appointments Clause is about Article I and seeking relief from an Article III court defeats the purpose of executive control. If the PTAB judges truly were inferior officers to the Director, then the Director would not need the help of this Court to exert influence and control over the PTAB decisions.

Lastly, PTAB judges are not subject to preemptory removal but enjoy the same good-cause removal protections as any member of the competitive service. 5 U.S.C. §§ 7521, 2102(a); 5 C.F.R. § 432.102(b)(6); 35 U.S.C. § 3(c). There is nothing to suggest that PTAB judges are subject to the “without cause” or “at will”

removal that was persuasive in *Edmond* and *Free Enterprise*. *Edmond*, 520 U.S. at 664; *Free Enter.*, 561 U.S. at 510.

**3. The Final Written Decision Must Be Set Aside On The Basis Of The Board Members' Improper Appointment**

The Supreme Court held in *Lucia* that the appropriate remedy for an Appointments Clause violation is a “new ‘hearing before a properly appointed’ official” *other* than the officials who already “heard [the] case and issued [the] decision” appealed from. *Lucia*, 138 S. Ct. at 2055. Therefore, to the extent that this Court does not reverse the Board’s decision, this case would need to be reheard before Board members who are constitutionally appointed. Because the PTAB judges to which the case would be remanded lack constitutional authority to hear it, the decision must be vacated and dismissed.

**4. The Appointments Clause Argument Is Properly Before This Court**

This challenge to the constitutionality of the appointment of PTAB judges is properly raised here. Because “adjudication of the constitutionality of congressional enactments has generally been thought beyond the jurisdiction of administrative agencies,” PTAB cannot resolve constitutional challenges to its own authority. *See Johnson v. Robinson*, 415 U.S. 361, 367 (1974). Invoking that principle, the Board declined to even consider this same issue in a recent institution decision. *E.g., Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-00366, Paper 11 at 36 (July 6, 2018)

(“We decline to consider the constitutional challenge as, generally, ‘administrative agencies do not have jurisdiction to decide the constitutionality of congressional enactments’ where consideration of the constitutional question would ‘require the agency to question its own statutory authority or to disregard any instructions Congress has given it.’”) (quoting *Riggin v. Office of Senate Fair Employment Practices*, 61 F.3d 1563, 1569-70 (Fed. Cir. 1995)).<sup>8</sup> Thus, raising the constitutional issue to the PTAB would have been futile. *See, e.g., Beard v. Gen. Servs. Admin.*, 801 F.2d 1318, 1321 (Fed. Cir. 1986) (“Moreover, since the Board’s view of its authority in reviewing penalties was fully settled, ‘raising this claim to the [Board] . . . would have been an exercise in futility, and presents an exception to the exhaustion doctrine.”); *Noel Canning v. NLRB*, 705 F.3d 490, 496-97 (D.C. Cir. 2013) (holding that questions of constitutional limits on an agency’s adjudicatory authority need not be raised before the agency).

Even if there were a potential waiver, prudential reasons favor excusing it. This Court is the first Article III court to have jurisdiction to address this purely legal issue, which requires no factual development, and the United States has intervened in this case to provide its view on the issue for the Court to consider. *See* Dkt. 24.

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<sup>8</sup> Polaris also raised the Appointments Clause issue in another PTAB proceeding, but the Board did not address it in its Final Written Decision. *Compare Kingston Tech. Co. v. Polaris Innovations Ltd.*, IPR2017-00116, Paper 17 [Patent Owner Response] at 62 (July 10, 2017) with Paper 31 [Final Written Decision] (Feb. 13, 2018).

Indeed, the Supreme Court has considered Appointments Clause challenges that were not raised in a lower tribunal. *See, e.g., Freytag*, 501 U.S. at 878-79 (“This Court in the past [] has exercised its discretion to consider nonjurisdictional claims that had not been raised below.”); *Glidden Co. v. Zdanok*, 370 U.S. 530, 535-36 (1962) (considering a constitutional challenge that was not raised in the appellate court).

Lastly, the Appointments Clause challenge should be considered now because it “presents significant questions of general impact or of great public concern” as shown by the thousands of filed petitions decided by unconstitutionally appointed judges. *Broad. Innovation, L.L.C. v. Charter Communs., Inc.*, 420 F.3d 1364, 1366 (Fed. Cir. 2005); *Automated Merch. Sys., Inc. v. Lee*, 782 F.3d 1376, 1379-80 (Fed. Cir. 2015) (deciding to consider an issue that would affect many PTO proceedings).

## **VI. CONCLUSION AND STATEMENT OF RELIEF SOUGHT**

For the foregoing reasons, the Court should vacate the Patent Trial and Appeal Board’s FWD and Revision Order.

Dated: May 24, 2019

Respectfully submitted:

/s/ Matthew D. Powers

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Yi Chen

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*Polaris Innovations Limited*

# **ADDENDUM**

## INDEX

<b>Date</b>	<b>Description</b>	<b>PTAB Designation in IPR2016-01622</b>	<b>Page Nos. ("Appx")</b>
9/10/2018	Decision Denying Patent Owner's Request for Rehearing <i>37 C.F.R. § 42.71(d)</i>	Paper 45	Appx1-11
2/5/2018	Final Written Decision <i>35 U.S.C. § 318(a) and 37 C.F.R. § 42.73</i>	Paper 35	Appx477- 504
4/12/2018	Decision Denying Patent Owner's Request for Rehearing <i>37 C.F.R. § 42.71(d)</i>	Paper 37	Appx528- 539
6/11/2018	Order Granting Petitioner's Request for Rehearing and Denying Petitioner's Motion to Limit the Petition <i>37 C.F.R. § 42.71(a),(d)</i>	Paper 42	Appx579- 594
2/1/2005	U.S. Patent 6,850,414 B2 (Benisek et al.)	Exhibit 1001	Appx740- 747

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571-272-7822

Paper: 45  
Entered: September 10, 2018

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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KINGSTON TECHNOLOGY COMPANY, INC.,  
Petitioner,

v.

POLARIS INNOVATIONS LTD.,  
Patent Owner.

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Case IPR2016-01622  
Patent 6,850,414 B2

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Before SALLY C. MEDLEY, JEAN R. HOMERE,  
And KEN B. BARRETT, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION  
Denying Patent Owner's Request for Rehearing  
*37 C.F.R. § 42.71(d)*

Appx1



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Patent 6,850,414 B2

## I. INTRODUCTION

On July 11, 2018, Polaris Innovations Ltd. (“Patent Owner”) filed a Request for Rehearing (Paper 44, “Request” or “Req. Reh’g”) of our Order of June 11, 2018 (Paper 42). Concurrent with its Request for Rehearing, Patent Owner filed Exhibits 2016–2020. Those exhibits are papers filed in the United States Court of Appeals for the Federal Circuit and an email exchange regarding Patent Owner’s request to brief the impact on this case of *PGS Geophysical AS v. Iancu*, 891 F.3d 1354 (Fed. Cir. June 7, 2018).

For the reasons provided below, Patent Owner’s Request for Rehearing is *denied*.

## II. PROCEDURAL POSTURE

Petitioner filed a Petition requesting *inter partes* review of claims 1–8 of U.S. Patent No. 6,850,414 B2 (“the ’414 patent,” Ex. 1001). Paper 2. Patent Owner filed a Preliminary Response to the Petition. Paper 6. The Board instituted *inter partes* review of claims 1 and 5–8 on the ground of obviousness under 35 U.S.C. § 103(a) over Simpson. Paper 7, 23. The Board did not institute a review as to dependent claims 2–4 and did not institute on all grounds. *Id.* at 6, 23. Petitioner filed a Request for Rehearing of The Board’s Institution Decision on Claim 4 (Paper 11), which was denied (Paper 16).

Subsequent to the institution decision, Patent Owner filed a Motion to Amend (“MTA,” Paper 18) seeking to cancel the instituted challenged claims and proposing to substitute a newly-presented claim 9 for dependent claim 8. Patent Owner characterized the proposed substitute claim 9 as “the same as challenged claim 8 in every respect, except that it simply adds the limitations of claim 4 . . . .” MTA 1. Patent Owner did not file a

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“Response” to the Petition. Subsequently, Petitioner filed an Opposition to Patent Owner’s Motion to Amend (Paper 20), and Patent Owner filed a Reply to Petitioner’s Opposition to Motion to Amend (Paper 23). Petitioner filed a Surreply to Patent Owner’s Motion to Amend (Paper 28). Thereafter Patent Owner filed a Brief Addressing Impact of *Aqua Products v. Matal*<sup>1</sup> (Paper 30). An oral hearing was held on November 14, 2017. See Paper 34 (Hearing Transcript).

On February 5, 2018, the Board issued a Final Written Decision. Paper 35. In that Decision, we determined that Petitioner had demonstrated by a preponderance of the evidence that claims 1 and 5–8 of the ’414 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Simpson. Additionally, we determined, based on a preponderance of the evidence in the entire trial record, that proposed substitute claim 9 is unpatentable, under 35 U.S.C. § 103(a), as obvious over Simpson and the Intel Specification. Patent Owner filed, on March 7, 2018, a request for rehearing of the Final Written Decision (Paper 36), which was denied on April 12, 2018 (Paper 37).

On April 24, 2018, the Supreme Court held that a decision to institute under 35 U.S.C. § 314 may not institute on less than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S.Ct. 1348, 1352–54 (2018).

On May 8, 2018, Petitioner sent to the Board and Patent Owner an email stating, in pertinent part: “Pursuant to the guidance provided by the Chief Judge in his recent webinar on *SAS*, Petitioner requests a conference call to ask permission to file an out of time request for reconsideration

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<sup>1</sup> *Aqua Products, Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017).

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seeking institution and a FWD on non-instituted claim 4 in [this] IPR.”  
Ex. 3002. Later that same day, Patent Owner replied: “Patent Owner is prepared to explain why Petitioner’s proposed request should not be authorized pursuant to the guidance provided on *SAS*.” *Id.* On May 11, 2018, Judges Barrett and Homere participated in a conference call with the parties to discuss the parties’ positions regarding Petitioner’s request. A transcript of that call has been filed as Exhibit 1026.

On May 21, 2018, we granted Petitioner’s request to excuse the lateness of the filing of a request for rehearing, authorized Petitioner to file a request for rehearing, authorized Patent Owner to file an opposition thereto, and authorized the parties to file a Joint Motion to Limit the Petition by removing specific claims and grounds upon which we did not institute review in the original Decision on Institution. Paper 39, 8.

On May 29, 2018, Petitioner filed a request for reconsideration, arguing that, in light of the *SAS* decision, we must issue a final written decision, before any appeal of this case, addressing the originally non-instituted claims, and particularly claim 4. Paper 40, 1–2. Petitioner further argued that we could proceed immediately to a final written decision regarding claim 4 because Patent Owner voluntarily placed the subject matter of claim 4 at issue via the Motion to Amend and because the parties had full opportunity to brief and argue the patentability of that subject matter. *Id.* at 2.

Patent Owner filed a response to Petitioner’s request for reconsideration. Paper 41. Patent Owner argued, *inter alia*, that the Board had been divested of jurisdiction and therefore could not grant Petitioner’s request and that Petitioner had waived any argument regarding *SAS* by not

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raising the issue earlier. *See id.* at 2–3. Patent Owner also argued that, if we were to institute a review of claim 4, we must constrain that review to the arguments made in the Petition and not consider Petitioner’s arguments made in opposition to Patent Owner’s Motion to Amend (which, we note, included the subject matter of claim 4). *Id.* at 5–7.

In our Order of June 11, 2018 (Paper 42)—which is the subject of Patent Owner’s present request for reconsideration—we, *inter alia*, granted Petitioner’s request for reconsideration, modified the institution decision to include all of the claims challenged in the Petition, determined that both parties had fully addressed the subject matter of claim 4, and determined that, for reasons set forth in the Final Written Decision, Petitioner had demonstrated that claim 4 is unpatentable, but had not demonstrated that claims 2 and 3 are unpatentable. *See* Paper 42, 10–14.

### III. ANALYSIS

A party requesting rehearing bears the burden of showing that the decision should be modified. 37 C.F.R. § 42.71(d). “The request must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply.” *Id.* When rehearing a decision on a petition, we review the decision for an abuse of discretion. 37 C.F.R. § 42.71(c).

Patent Owner requests reconsideration of our decision to include, in light of the *SAS* decision, a review of dependent claim 4. Req. Reh’g 1. Patent Owner argues that we should have deemed Petitioner to have waived a request for *SAS*-based relief. *Id.* at 1–12. Patent Owner further requests, should we not exclude claim 4 from review, “that the Board reconsider its

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order that claim 4 is unpatentable, withdraw that order, and authorize Patent Owner to file a response to the Petition with respect to the instituted ground of review of claim 4.” *Id.* at 1; *see id.* at 12–15. Lastly, Patent Owner argues that there is good cause to add to the record Exhibits 2016–2019 (and presumably Exhibit 2020). *Id.* at 15.

*A. Arguments Regarding Petitioner’s Purported Waiver of a SAS Challenge*

Patent Owner argues that Petitioner should have sought *SAS*-based relief prior to the issuance of the *SAS* decision, and that Petitioner has waived a challenge to partial institution. *See* Req. Reh’g 1–2. Patent Owner asserts that we did not consider the Director’s position on waiver as set forth in briefing in *PGS Geophysical AS v. Iancu*, Nos. 2016-2470, -2472, -2474 (Fed. Cir. 2018) and in *Polaris Industries Inc. v. Arctic Cat, Inc.*, Nos. 2017-1870, -1871, 724 (Fed. Cir. 2018) (Mem.). *Id.* at 3, 6–7.<sup>2</sup> According to Patent Owner, applying the Director’s position to the facts of this case demand that we deem Petitioner to have waived *SAS*-based relief and any challenge to partial institution. *Id.* at 7–8. Patent Owner also argues that the decision in *PGS* supports its position. *Id.* at 7–8.

Patent Owner’s reliance on *PGS Geophysical* is misplaced. That case involved “transition issues” pertaining to the treatment of cases that are on appeal at the Federal Circuit after the issuance of the *SAS* decision but that arose from the Board under pre-*SAS* practice. *PGS Geophysical*, 891 F.3d at 1360. In *PGS*, our reviewing court determined that it had jurisdiction over the appeal resulting from a partial institution. *See id.* at 1360–61. The court

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<sup>2</sup> Decisions issued as *PGS Geophysical AS v. Iancu*, 891 F.3d 1354 (Fed. Cir. 2018) and *Polaris Indus. Inc. v. Arctic Cat, Inc.*, 724 Fed. Appx. 948 (Fed. Cir. May 30, 2018) (Mem.).

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noted that no party sought at any time *SAS*-based relief. *Id.* at 1359 (“Neither PGS nor the Director asks for any *SAS*-based action—whether to block our deciding the appeal on the instituted claims and grounds or to revive the ‘non-instituted’ claims or grounds. Nor has a request for *SAS*-based relief been filed by WesternGeco, which settled with PGS and withdrew from the appeals long ago.”); *see also id.* at 1362 (with emphasis added) (“Even if the Board could be said to have acted “*ultra vires*” in refusing to institute reviews of some claims and grounds—and then proceeding to merits decisions concerning the claims and grounds included in the instituted reviews—the Board’s error is waivable, not one we are required to notice and act on *in the absence of an appropriate request for relief on that basis.*”).

In contrast, the subject case has not been appealed to the Federal Circuit, Petitioner sought *SAS*-based relief from the Board prior to any party filing a notice of appeal and prior to the expiration of the time for doing so, and the case remains before the Board for consideration, in the first instance, of the parties’ arguments regarding *SAS*-based relief.

Patent Owner’s reliance on the Office’s briefing in appeals before the Federal Circuit similarly is misplaced. As noted, no party argued for *SAS*-based relief in *PGS*, thus, the Office’s statement that “[n]either Patent Owner, PGS Geophysical AS, nor Petitioner, WesternGeco LLC, preserved an objection to the Patent Trial and Appeal Board’s (‘Board’) partial institution” (Ex. 2016, 2), is not inconsistent with our decision in the present case where Petitioner raised an objection to partial institution with the Board prior to appeal. Likewise, the Office’s position in *PGS* that “a party generally may not challenge an agency decision on a basis that was not

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presented to the agency” (Ex. 2018, 8) is not inconsistent with our determination in this case where Petitioner presented to the agency, prior to an appeal, a challenge to our partial institution decision and a request for *SAS*-based relief. In *Polaris*, the Office made a similar statement. Ex. 2020, 8 (“Under general administrative law principles, a party may not challenge an agency decision on a basis that was not presented to the agency in the first instance.”). In that regard, the Office identified a request for rehearing after final written decision as a juncture where *Polaris* might have had the opportunity to raise the partial institution issue. *Id.* In this case, Petitioner raised the partial institution issue via such a request for reconsideration after the Final Written Decision.

Additionally, the Federal Circuit’s decision on the *Polaris SAS*-based relief issue supports the correctness of our determination of no waiver here.

We further conclude that *Polaris* did not waive its right to seek remand by not arguing against partial institution before the Board. Precedent holds that a party does not waive an argument that arises from a significant change in law during the pendency of an appeal. . . . Prior to the Supreme Court’s decision in *SAS*, any attempt to argue against partial institution would have been futile under the Board’s regulations and our precedent. . . . *Polaris*’s failure to challenge the Board’s partial institution before the Supreme Court’s issuance of *SAS* is therefore excused.

*Polaris Indus. Inc. v. Arctic Cat, Inc.*, 724 F. App’x 948, 949–50 (Fed. Cir. 2018) (Mem.) (non-precedential) (citations omitted)

Patent Owner has not identified any matter that we misapprehended or overlooked concerning a purported waiver of *SAS*-based relief.

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*B. The Request to Respond Regarding Claim 4*

Patent Owner requests that—in light of our modification of the institution decision after *SAS* in order to render a final written decision on all the challenged claims—it be authorized to file now a response to the Petition regarding claim 4. Req. Reh’g 12 (citing 35 U.S.C. § 316(a)(8)). We addressed Patent Owner’s arguments in this regard at pages 10–12 of the June 11, 2018, Order (Paper 42), and Patent Owner does not identify any matter in that regard that we misapprehended or overlooked.

Although not captioned as a “Response,” Patent Owner did file, at a relatively early stage of the trial and after our Decision on Institution (Paper 7), a Motion to Amend in response to the Petition, and Patent Owner, in that motion, addressed claim 4. MTA (Paper 18); *see, e.g., id.* at 1 (referring to the challenge to claim 4 in the Petition and asserting that “the substitute claim is the same as challenged claim 8 in every respect, except that it simply adds the limitations of claim 4, which the Board has already repeatedly determined has not been shown by Petitioner in this case to have a reasonable likelihood of being unpatentable.”); *id.* at 4 (“Every limitation of the substitute claim already appears in claim 4 or claim 8, and as just discussed, the limitation that already appears in claim 4 has already been found to not have been shown by Petitioner in this case to be disclosed or suggested by the prior art.”). By reinjecting into this case the limitation of dependent claim 4, Patent Owner agreed to a review of that claim, thereby effectively instituting a review of that claim. It primarily is Petitioner’s arguments and evidence in opposition to Patent Owner’s Motion to Amend that established the unpatentability of the subject matter of claim 4. *See* Order of June 11, 2018 (Paper 42) 13–14; Final Written Decision (Paper 35)



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21–27. In other words, the pertinent portion of the record primarily is that developed after Patent Owner effectively agreed to a review of the subject matter of claim 4 via the Motion to Amend. As discussed in the Order of June 11, 2018 (Paper 42) at pages 11–12, Patent Owner was on notice and had ample opportunity to address Petitioner’s arguments and evidence directed to the subject matter of claim 4. Further, in light of Patent Owner’s assertion that the Petition and the record as developed at the time of our Institution Decision does not demonstrate the unpatentability of claim 4 (*see, e.g.*, Paper 23, 9), we fail to see—and Patent Owner has not indicated—why a response to the Petition is now necessary or what more remains to be said.

#### IV. EXHIBITS 2016–2020

Patent Owner filed Exhibit 2016–2020 concurrently with its Request for Rehearing. According to Patent Owner, “[t]hese exhibits are public orders (Ex. 2017), public briefs (Exs. 2016 & 2018), or emails between the Board and the parties (Ex. 2019).” Req. Reh’g 15; *see also* Ex. 2020 (another paper filed in the United States Court of Appeals For The Federal Circuit). The filing of these Exhibits, which were not in the record at the time of the Order that is the subject of the present Request for Rehearing, was not authorized and Patent Owner has not shown good cause for admitting the exhibits now. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,768 (Aug. 14, 2012) (“Evidence not already of record at the time of the decision will not be admitted [with a Rehearing Request] absent a showing of good cause.”). Nonetheless, we will allow the exhibits to remain in the record in order to have a complete record for any appeal in this case.

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V. ORDER

For the foregoing reasons, it is

ORDERED that Patent Owner's Request for Rehearing is *denied*.

PETITIONER:

David Hoffman  
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Martha Hopkins  
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PATENT OWNER:

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Paper 35  
Entered: February 5, 2018

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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KINGSTON TECHNOLOGY COMPANY, INC.,  
Petitioner,

v.

POLARIS INNOVATIONS LTD.,  
Patent Owner.

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Case IPR2016-01622  
Patent 6,850,414 B2

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Before SALLY C. MEDLEY, JEAN R. HOMERE,  
and KEN B. BARRETT, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

FINAL WRITTEN DECISION  
*35 U.S.C. § 318(a) and 37 C.F.R. § 42.73*

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## I. INTRODUCTION

### A. Background and Summary

Kingston Technology Company, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–8 of U.S. Patent No. 6,850,414 B2 (“the ’414 patent,” Ex. 1001). Paper 2 (“Pet.”). Polaris Innovations Ltd. (“Patent Owner”)<sup>1</sup> filed a Preliminary Response to the Petition. Paper 6 (“Prelim. Resp.”). The Board instituted *inter partes* review (Paper 7, “Inst. Dec.”) of claims 1 and 5–8 on the ground of obviousness under 35 U.S.C. § 103(a) over Simpson<sup>2</sup>. The Board did not institute a review as to dependent claim 4. Petitioner filed a Request for Rehearing of The Board’s Institution Decision on Claim 4 (Paper 11), which was denied (Paper 16).

Patent Owner filed a Motion to Amend seeking to cancel the instituted challenged claims and proposing to substitute a newly-presented claim 9 for dependent claim 8. Paper 18 (“MTA”). Patent Owner did not file a Response to the Petition. Subsequently, Petitioner filed an Opposition to Patent Owner’s Motion to Amend (Paper 20, “MTA Opp.”), and Patent Owner filed a Reply to Petitioner’s Opposition to Motion to Amend (Paper 23, “MTA Reply”).

On October 4, 2017, the Federal Circuit issued an *en banc* decision in *Aqua Products, Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017) addressing the burden of proof that the Board applies when considering the patentability of

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<sup>1</sup> Patent Owner identifies Polaris Innovations Ltd., Wi-LAN Inc., and Quarterhill Inc. as real parties-in-interest. Paper 4, 1; Paper 19, 1.

<sup>2</sup> UK Patent Application GB 2 289 573 A, published Nov. 22, 1995 (Ex. 1002).

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substitute claims presented in a motion to amend filed under 35 U.S.C. § 316(d).

Pursuant to our authorization (Paper 25), Petitioner filed a Surreply to Patent Owner's Motion to Amend (Paper 28, "MTA Surreply"). Thereafter and pursuant to our authorization (Paper 29), Patent Owner filed a Brief Addressing Impact of *Aqua Products v. Matal* (Paper 30).

An oral hearing was held on November 14, 2017, and a transcript of the hearing is included in the record. Paper 34 ("Tr.").

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). After consideration of the parties' arguments and evidence, and for the reasons discussed below, we determine that Petitioner has shown by a preponderance of the evidence that claims 1 and 5–8 of the '414 patent are unpatentable. Based on the entirety of record before us, we also determine that a preponderance of the evidence establishes that substitute claim 9 presented in the Motion to Amend is unpatentable over the prior art of record.

#### *B. Related Proceedings*

According to the parties, the '414 patent is involved in *Polaris Innovations Ltd. v. Kingston Tech. Co., Inc.*, Case No. 8:16-cv-300 (C.D. Cal.). Pet. 1; Paper 4, 1.

Petitioner filed a petition seeking *inter partes* review of claim 4 of the '414 patent in Patent Trial and Appeal Board Case IPR2017-00974 (Paper 2). In that case, the Board exercised its discretion under 35 U.S.C. §§ 314(a) and 325(d) to not institute an *inter partes* review. IPR2017-00974, Paper 8. Petitioner's request for reconsideration of that decision was denied. IPR2017-00974, Papers 9, 11.

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*C. The '414 Patent*

The '414 patent, titled "Electronic Printed Circuit Board Having a Plurality of Identically Designed, Housing-Encapsulated Semiconductor Memories," issued February 1, 2005, from U.S. Patent Application No. 10/187,763. Ex. 1001 at [54], [45], [21].

The '414 patent generally relates to an electronic printed circuit board having a memory module comprised of identically designed semiconductor memories configured on the printed circuit board. *Id.* at Abstract. "Printed circuit boards of this type are inserted into motherboards of personal computers or network computers and serve as the main memory." *Id.* at 1:21–23. Figures 1A and 1B are reproduced below.

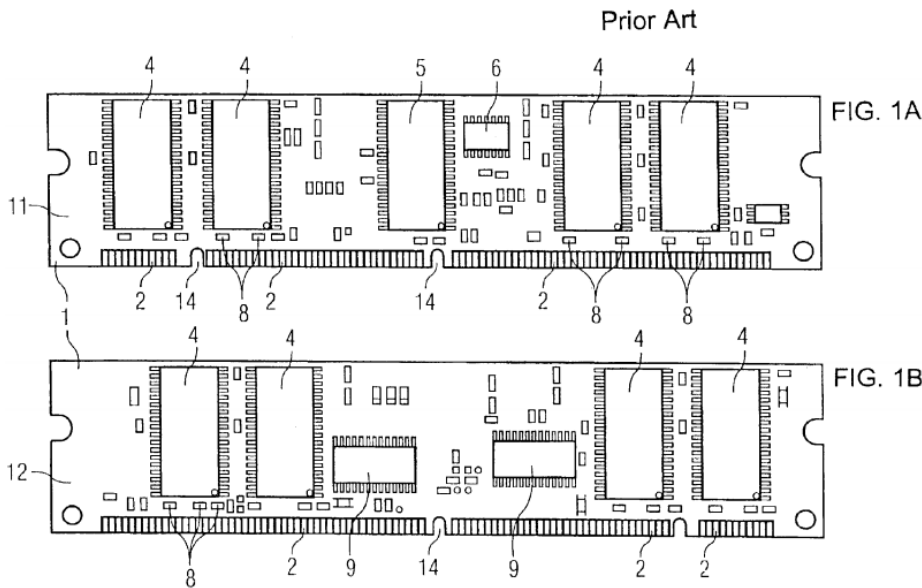
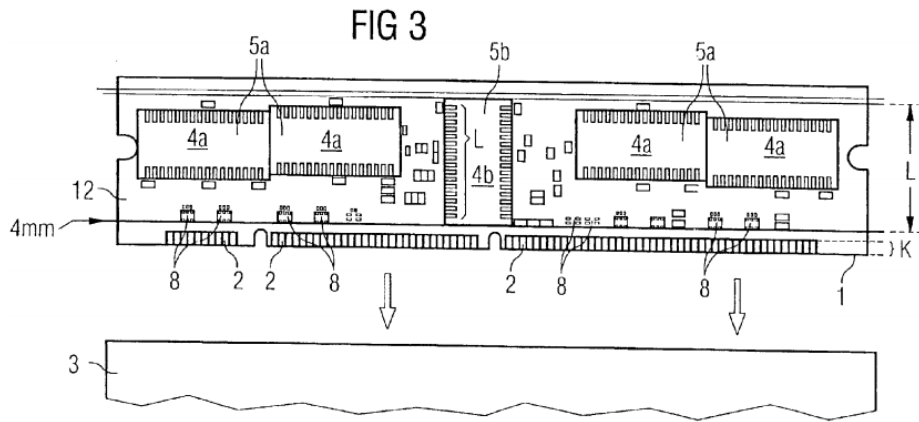


Figure 1A shows the front side of a conventional printed circuit board and Figure 1B shows the rear side of a conventional printed circuit board. *Id.* at 5:6–10. According to the '414 patent, in a conventional arrangement,

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semiconductor memories 4 are arranged on the front and rear sides of the printed circuit board in the same orientation as error correction chip 5. *Id.* at 1:62–67. “In the case of this conventional arrangement . . . there is no more leeway for a further reduction of the circuit board height (the height of the printed circuit board perpendicular to the contact strip).” *Id.* at 2:37–41. In network computers, however, “the printed circuit boards are inserted into compartment-type elements having a small height, for which reason the printed circuit boards themselves should also have only a small height.” *Id.* at 1:23–27.

To address this problem, the '414 patent discloses an electronic printed circuit board in which the error correction chip remains oriented perpendicular to the contact strip but the other semiconductor memories are oriented parallel to the contact strip, such that it is “possible to reduce the height of the printed circuit board while enabling the rectangular housing to keep the same physical form.” *Id.* at Abstract. Figure 3 is reproduced below.



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Figure 3 shows the rear side of a printed circuit board according to an embodiment of the '414 patent. *Id.* at 5:13–14. In this arrangement, housings 5a of semiconductor memories 4a are arranged horizontally on printed circuit board 1, and only housing 5b of error correction chip 4b is arranged vertically. *Id.* at 6:19–28. Housing 5b is “brought up to [] contact strip 2 as close as possible” because “there is no need for any resistors 8 [between housing 5b and contact strip 2], as in the case of all of the other identically designed semiconductor memories 4a that are configured horizontally.” *Id.* at 6:28–35. “As a result, the height of printed circuit board 1 can be reduced from a value of  $H_1$  to a smaller value  $H_2$ ” (*id.* at 6:41–42), as shown in Figure 2, which is reproduced below.

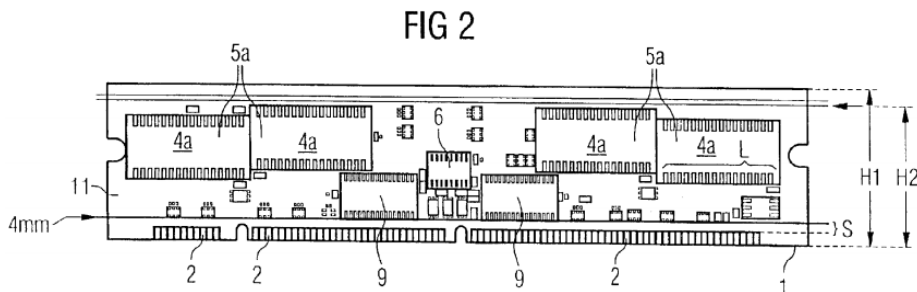


Figure 2 shows the front side of a printed circuit board according to an embodiment of the '414 patent. *Id.* at 5:11–12.

#### *D. Illustrative Claim*

Claim 1 of the '414 patent is an independent claim. Claims 2–8 all depend directly from Claim 1. Claim 1, reproduced below, is illustrative:

1. An electronic printed circuit board configuration, comprising:
  - an electronic printed circuit board having a contact strip for insertion into another electronic unit; and



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a memory module having at least nine identically designed integrated semiconductor memories;

each one of said semiconductor memories being encapsulated in a rectangular housing having a shorter dimension and a longer dimension;

said housing of each one of said semiconductor memories being identically designed and being individually connected to said printed circuit board;

one of said semiconductor memories being connected as an error correction chip;

said longer dimension of said housing of said error correction chip being oriented perpendicular to said contact strip; and

said longer dimension of said housing of each one of said semiconductor memories, other than said error correction chip, being oriented parallel with said contact strip.

Ex. 1001, 7:24–8:3.

## II. ANALYSIS OF THE INSTITUTED CHALLENGE

### A. Principles of Law

Petitioner bears the burden of proving unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must establish the facts supporting its challenge by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A patent 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 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

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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) any objective evidence of non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

*B. The Level of Ordinary Skill in the Art*

Petitioner’s expert, Dr. Vivek Subramanian, opines that “a person of ordinary skill in the art as of the time of the ’414 Patent would have a Bachelor’s degree in Electrical Engineering and at least 2 years’ experience working in the field of semiconductor memory design.” Ex. 1006 ¶ 17; *see* Pet. 5–6 (citing the same). This definition is consistent with the level of ordinary skill reflected in the prior art references of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself may reflect an appropriate level of skill in the art). Patent Owner does not dispute Petitioner’s definition. We adopt Dr. Subramanian’s definition of the person of ordinary skill in the art.

*C. Claim Construction*

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see also Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under the broadest reasonable construction standard, claim terms 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 patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

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*1. Individually Connected*

Claim 1 recites “said housing of each one of said semiconductor memories . . . being *individually connected* to said printed circuit board” and “one of said semiconductor memories being *connected* as an error correction chip.” Ex. 1001, 7:33–37 (emphasis added).

In the Institution Decision, we addressed the construction of the claim term “connected” due to the parties’ arguments concerning the Simpson reference. Inst. Dec. 7–8. Patent Owner argued in its Preliminary Response that Simpson does not teach “‘connecting’ an error correction chip to the PCB [printed circuit board] as claimed,” because the Simpson chip identified by Petitioner as an error correction chip is mounted in a socket rather than soldered directly to the printed circuit board. Prelim. Resp. 31. Petitioner argued that “a socket is a type of connection.” Pet. 22–23 (citing Ex. 1006 ¶ 60). We agreed with Petitioner, noting that the ’414 patent does not explicitly define “connected” and Patent Owner identified nothing in the Specification to support a construction of that term to exclude connections via a socket. Inst. Dec. 8. Accordingly, we determined, for purposes of the Institution Decision, “the broadest reasonable interpretation of ‘connected’ encompasses being connected to the printed circuit board via a socket.” *Id.*

Patent Owner, in its reply to Petitioner’s opposition to the Motion to Amend, impliedly argues that the modifier “individually” means the memory housings must be *directly* connected to the printed circuit board. MTA Reply 10. Specifically, Patent Owner argues that being connected through “an intermediary with receptacles” is not “directly connected” and thus Simpson lacks the recited “individually connected” semiconductor memory housings in that “Simpson’s alleged memory chips are connected to

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sockets, that are in turn connected to its printed circuit board.” *Id.* at 10–11 (citations omitted). Patent Owner asserts that its proposed construction of “individually” as meaning “directly” is supported by a purported admission of Petitioner’s expert, Dr. Subramanian, during cross examination. *Id.* (citing Ex. 2012 (Subramanian Dep. Tr.), 234:6–237:22; Ex. 2013 (deposition exhibit)). We have reviewed the cited pages of the deposition transcript and agree with Petitioner that that portion of the deposition involves a “confusing hypothetical arrangement” (MTA Surreply 1–2). Patent Owner does not explain adequately or persuasively how this ambiguous extrinsic evidence supports its argument that the claim phrase “individually connected” should be construed as limited to direct connections.

Having considered the parties’ arguments and the complete record, we again determine that the broadest reasonable interpretation of “connected” encompasses being connected to the printed circuit board via a socket, and further determine that the claim term “individually” does not require the subject components to be directly connected.

## 2. *Error Correction Chip*

In the Institution Decision, we indicated that we were persuaded that the ’414 patent uses, in independent claim 1, the term “error correction” broadly enough to encompass parity, and we preliminarily construed “error correction chip” as “a chip that is able to perform at least error checking on data stored in other semiconductor memories.” Inst. Dec. 8–9 (quoting Ex. 1001, 7:1–9). Although Patent Owner did not propose in the Preliminary Response an explicit construction for the term, we determined that a preliminary construction in the Institution Decision was necessary due

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to Patent Owner's arguments concerning claim 1. *Id.* at 7. After issuance of the Institution Decision, Patent Owner did not address further the meaning of the term, and it appears that it no longer is in dispute. We adopt that earlier construction in this Final Decision.

*D. The Instituted Challenge: The Alleged Obviousness of Claims 1 and 5–8 over Simpson*

As mentioned above, we instituted an *inter partes* review of Petitioner's challenge to claims 1 and 5–8 as being obvious over Simpson. Inst. Dec. 23; *see* Pet. 10–27. In the Petition, Petitioner relied upon the Declaration of Vivek Subramanian, Ph.D. (Ex. 1006). *See, e.g.*, Pet. 9–10. Patent Owner did not file a response to the petition after the decision on institution, but did file a Motion to Amend. In that motion, which we deny for the reasons discussed below, Patent Owner requests the cancellation of the instituted claims 1 and 5–8 and proposes the entry of a substitute claim. MTA 1. By not filing a response to the Petition, and requesting cancellation of claims 1 and 5–8 not based on any apparent contingency, Patent Owner has waived any argument that the challenged claims for which we instituted review—claims 1 and 5–8 of the '414 patent—would not have been obvious over Simpson. *See, e.g.*, Paper 8, 3 (Scheduling Order stating: "The patent owner is cautioned that any arguments for patentability not raised and fully briefed in the response will be deemed waived."). Nonetheless, we review anew Petitioner's arguments and the evidence concerning the obviousness challenge to claims 1 and 5–8 and we consider Patent Owner's arguments (*see* MTA Reply 10–11), made in the context of the Motion to Amend, concerning limitations of at least claim 1 that necessarily are incorporated in

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proposed substitute claim 9 by virtue of its dependency from independent claim 1.

1. Simpson (Ex. 1002)

Simpson describes a memory module with memory devices and with sockets on one or both faces of the module for coupling additional memory modules. Ex. 1002, [57]. Figures 1 and 3 of Simpson are reproduced below.

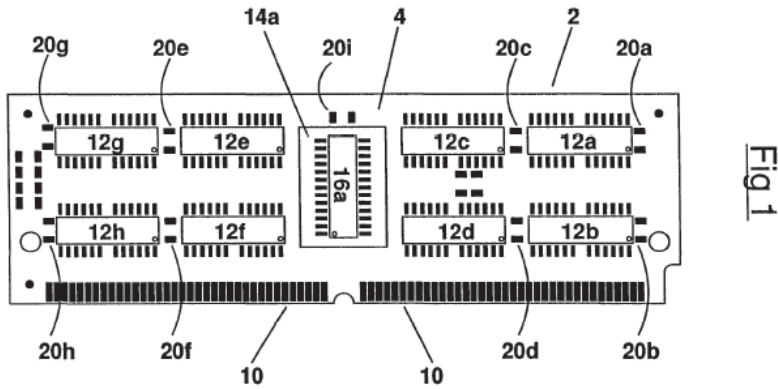


Fig 1

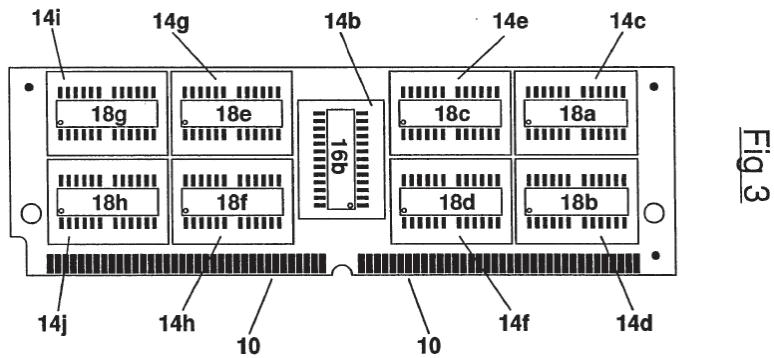


Fig 3

Figures 1 and 3 depict a front view and a rear view, respectively, of a memory module according to Simpson. *Id.* at 12:19–26. As shown in Figure 1 (in which lowercase letters are used in element numbers), a printed circuit board includes memory devices 12A–12H oriented horizontally to connector terminal strip 10 and parity memory device 16A mounted in

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socket 14A oriented vertically to connector terminal strip 10. *Id.* at 9:18–10:17. “The memory devices 12A–12H are electrically and mechanically connected to the substrate 4.” *Id.* at 10:1–2. “In addition to the memory devices 12A–12H, the sockets 14A–14J to take additional devices are also attached to the substrate 4.” *Id.* at 10:5–7.

## 2. Independent Claim 1

With respect to claim 1, Petitioner asserts, and we agree, that Simpson’s printed circuit board with connector terminal strip 10 teaches the claim’s recited “electronic printed circuit board having a contact strip.” *See* Pet. 16–18; Ex. 1006 ¶¶ 42–46.

Petitioner relies upon Simpson’s memory devices 12A–12H and 16A as teaching the recited “at least nine identically designed integrated semiconductor memories,” and relies upon Figure 1 as teaching that memory devices 12A–12H and 16A are “encapsulated in a rectangular housing,” each of which is “identically designed” and “individually connected to said printed circuit board.” Pet. 18–22; Ex. 1006 ¶¶ 47–61. In this regard, Petitioner, relying on the testimony of Dr. Subramanian, persuasively asserts that “[t]hose of ordinary skill in the art would understand that the memory device 16A is identical to each of memory devices 12A-12H,” and, alternatively, that it would have been obvious to one of ordinary skill in the art to use identically designed memory and error correction chips. Pet. 19 (citing Ex. 1006 ¶ 48; Ex. 1002, 10:22-28, 12:10–14); *id.* at 25–26 (citing Ex. 1006 ¶¶ 63–64). As discussed above, we have declined to adopt a construction of “individually connected” that would exclude an indirect connection. Petitioner notes that “Simpson further discloses that the ‘memory devices 12A-12H are electrically and mechanically connected to

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the substrate 4.” Pet. 22 (quoting Ex. 1002, 10:1-5). Regarding Simpson’s disclosure of the use of sockets on the circuit board, we also are persuaded by Petitioner’s contention that “[o]ne of ordinary skill in the art would understand that connection of a memory chip via a socket is a type of connection.” Pet. 22 (citing Ex. 1006 ¶ 60).

Petitioner asserts, and we agree, that Simpson’s parity memory device 16A is “an error correction chip,” and that Figure 1 teaches memory device 16A “being oriented perpendicular to said contact strip.” Pet. 23–27; Ex. 1006 ¶¶ 62–66.

Lastly, Petitioner notes that Simpson’s Figure 1 depicts memory devices 12A–12H “being oriented parallel with said contact strip.” Pet. 27; Ex. 1006 ¶¶ 67–69.

We are persuaded by Petitioner’s showing, and adopt it as our own, that Simpson renders obvious independent claim 1.

### 3. *Dependent Claims 5–8*

Patent Owner, in its Preliminary Response to the Petition, did not present separate arguments for dependent claims 5–8 and Patent Owner did not submit a response to the Petition after institution. We have reviewed Petitioner’s explanations and supporting evidence regarding dependent claims 5–8, *see* Pet. 38–43, and we determine that Petitioner has shown by a preponderance of the evidence that dependent claims 5–8 are unpatentable under 35 U.S.C. § 103 over Simpson.

## III. MOTION TO AMEND

### A. *Proposed Substitute Claim*

Patent Owner filed a Motion to Amend and moves to cancel all the instituted challenged claims—claims 1 and 5 through 8—and to substitute



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new claim 9 for challenged claim 8. MTA 1, 2, Appendix. Proposed substitute claim 9 adds to claim 8 (which depends directly from independent claim 1) the printed circuit board height limitation of dependent claim 4 (which also depends directly from independent claim 1). Proposed substitute claim 9 is reproduced below with underlining indicating text added to dependent claim 8.

9. The printed circuit board according to claim 1, wherein:  
said printed circuit board has a width of 5.25 inches and  
has a height of 1 to 1.2 inches perpendicular to said contact strip.

MTA, Appendix. As a dependent claim, proposed substitute claim 9 necessarily includes all the limitations of independent claim 1 from which it depends.

We note that this is not simply a case where Patent Owner seeks to rewrite dependent claim 4 in independent form. Because dependent claim 4 and dependent claim 8—which together now form proposed substitute claim 9—both depend directly from independent claim 1, the Motion to Amend is the first time that the width and height limitations have appeared in the same claim. *See* Tr. 86:3–20.

*B. Motions to Amend in view of Aqua Products*

On October 4, 2017, the Federal Circuit issued an *en banc* decision in *Aqua Products, Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017). In light of the *Aqua Products* decision, the Board will not place the burden of persuasion on a patent owner with respect to the patentability of substitute claims presented in a motion to amend. *Aqua Products*, 872 F.3d at 1327; *see also* “Guidance on Motions to Amend in view of *Aqua Products*” (Nov. 21, 2017) (<https://www.uspto.gov/sites/default/files/documents/guidance>

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\_on\_motions\_to\_amend\_11\_2017.pdf) (“Guidance”). A motion to amend still must meet the statutory requirements of 35 U.S.C. § 316(d) and the procedural requirements of 37 C.F.R. § 42.121. *See* Guidance.

Because, for the reasons set forth below, we determine that the proposed substitute claim is not patentable, we do not need to determine whether the Motion to Amend meets the requirements of 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121.

*C. The Alleged Untimeliness of Petitioner’s Arguments in Opposition to the Motion to Amend*

Patent Owner argues that Petitioner’s arguments in opposition to the Motion to Amend and proposed substitute claim 9 are untimely attacks on dependent claim 4, and urges that we proceed immediately to a determination that the proposed substitute claim 9 is patentable without further input from Petitioner after the decision declining to institute a review of dependent claim 4. *See* MTA Reply 1, 5, 9. In effect, Patent Owner contends that Petitioner should have made its case for unpatentability of the proposed amended claim 9 in the Petition and that Petitioner now should be foreclosed from opposing the Motion to Amend.

Patent Owner’s position apparently is premised on several misconceptions based on the denial of institution as to Petitioner’s challenges to claim 4. For example, Patent Owner implies that we conclusively ruled on the merits of the patentability of claim 4 at the institution stage in this case and that we found that the height limitation of claim 4 was not disclosed in the prior art. *See* MTA Reply 1 (“the Board has already rejected [Petitioner’s] positions on the merits at least three times”); *id.* at 3 (emphasis omitted, “Claim 9 simply adds to the limitations of

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instituted Claim 8 the limitation of Claim 4—the exact same limitation that the Board has found, three times, not disclosed by Petitioner’s references and arguments.”); *id.* at 3 (“Patent Owner’s Motion adds a substitute claim, Claim 9, that has a limitation the Board has already repeatedly found was not in the references raised by Petitioner. Patent Owner is entitled to rely on those prior rulings for purposes of its Motion to Amend.”); MTA 3–4 (“the limitation that already appears in claim 4 has already been found to not have been shown by Petitioner in this case to be disclosed or suggested by the prior art.”).

The decision on institution was made pursuant to 35 U.S.C. § 314, while our final written decision—including the consideration of the Motion to Amend—is made pursuant to a different statute, 35 U.S.C. § 318. Here, our analyses made in arriving at these two types of decisions are not the same. In our institution decision and as detailed below, we evaluated Petitioner’s articulation of a case of obviousness (*see, e.g.*, Inst. Dec. 16–17), whereas we now must render a final written decision on the patentability of a proposed substitute claim not previously considered based on the entirety of the record, *see* 35 U.S.C. § 318(a) (“If an inter partes review is instituted and not dismissed under this chapter, the Patent Trial and Appeal Board shall issue a final written decision with respect to the patentability of any patent claim challenged by the petitioner and any new claim added under section 316(d).”); *see also Aqua Prods.*, 872 F.3d at 1296 (“The matter is remanded for the Board to issue a final decision under § 318(a) assessing the patentability of the proposed substitute claims without placing the burden of persuasion on the patent owner.”).

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Contrary to Patent Owner’s implied arguments, we have neither determined affirmatively that dependent claim 4 is patentable nor found the height limitation missing from the prior art. Petitioner challenged, in the Petition, claims 1–8 of the ’414 patent. As to dependent claim 4 (reciting the height limitation), we did not institute on the ground of obviousness over Simpson, stating “Petitioner has not explained sufficiently how or why a person of ordinary skill in the art would have modified Simpson to achieve a height of ‘1 to 1.2 inches perpendicular to said contact strip.’” Inst. Dec. 17 (quoting Ex. 1001, 8:19–20 (’414 patent, claim 4)). Similarly, we did not institute a review on the ground of Simpson in combination with the Intel Specification<sup>3</sup> because “Petitioner continues to rely solely on its argument that the limitations would have been an ‘obvious design choice’ without explaining persuasively how and/or why a person of ordinary skill in the art would have made the proposed modifications to Simpson in view of the teachings of the Intel Specification.” *Id.* at 18; *see also id.* at 20–21, 22 (declining to institute as to other grounds based on inadequate reasoning). We denied Petitioner’s request for reconsideration, in pertinent part, because Petitioner had not addressed whether one of ordinary skill would have been able to fit two rows of chips on a circuit board having a height of only 1 to 1.2 inches. Paper 16, 6. Petitioner filed another petition challenging claim 4, and that second petition was the subject of a discretionary denial in light of the first petition. IPR2017-00974, Papers 2, 8. Petitioner’s request for reconsideration of that decision was denied. IPR2017-00974, Papers 9,

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<sup>3</sup> PC SDRAM UNBUFFERED DIMM SPECIFICATION, Rev. 1.0, Feb. 1998 (the “Intel Specification”) (Ex. 1003).

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11. In denying that request for reconsideration, we confirmed “[i]n neither decision [denying institution as to claim 4] did the Board determine affirmatively that claim 4 is patentable over the prior art asserted in the respective petitions.” IPR2017-00974, Paper 9, 5. Accordingly, Patent Owner’s reliance on those prior decisions is misplaced.

Patent Owner also argues that its desired outcome in this case is required by an unrelated Board decision, *Amerigen Pharms. Ltd. v. Shire LLC*, Case IPR2015-02009, Paper 38 (PTAB Mar. 31, 2017) (non-precedential) (Ex. 2011). MTA Reply 1, 6–8. In the *Amerigen* case, the panel granted a motion to amend after considering and finding unpersuasive the petitioner’s arguments in opposition to the motion. *Amerigen*, slip op. 5–6. We fail to see how that fact-specific ruling supports Patent Owner’s arguments that we should not consider Petitioner’s arguments in this case. Additionally, Patent Owner acknowledges that a key consideration in the *Amerigen* panel’s decision was the fact that the substitute claim “included only limitations of non-instituted or non-challenged claims.” MTA Reply 7 (citing Ex. 2011, 4–5); *see Amerigen*, slip op. 5 (“the practical effect of [the proposed substitution] would be to leave no instituted claim remaining in the trial.”). In *Amerigen*, the panel stated that, “[e]ffectively, no claim [was] being amended, and claims [were] only being cancelled . . . .” *Amerigen*, slip op. at 6 (quoting the patent owner’s argument; internal quotations omitted); *id.* at 6 (“With the cancellation of claims 18–25, and the entry of substitute claim 26, there would be no claim remaining subject to *inter partes* review in this proceeding.”). That fact pattern is not present in the case before us.

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*Amerigen* does not, as Patent Owner implies, establish a procedural rule that precludes a petitioner from opposing a motion to amend.

Lastly, we note that—after the denials of institution as to claim 4 and at which point it no longer was involved in this *inter partes* review—Patent Owner did not remain silent as to that claim. Notwithstanding that Patent Owner’s Motion to Amend reflects a willingness to cancel the instituted claims—a group which does not include claim 4—Patent Owner did not simply request to cancel the instituted claims and seek adverse judgment, which, if granted, would have ended this *inter partes* review and would have left claim 4 unaddressed ever again in this proceeding. *Cf.* Inst. Dec. 23; Tr. 88:7–8 (Patent Owner asserting: “Everyone agrees that had we not filed a motion to amend, you couldn’t revisit the claim 4 decision in this case.”). Rather, Patent Owner made a strategic decision to propose a substitute amended claim that includes the limitation of challenged and instituted dependent claim 8 along with the limitation of non-instituted dependent claim 4. Petitioner argues that Patent Owner added the limitation of claim 4 back into the case in the form of proposed claim 9 in order for estoppel to attach to it, and thereby “materially harm[] the petitioners in District Court,” and maintains that it would be a due process violation to attach estoppel based on a decision at the institution stage.<sup>4</sup> Tr. 74, 102; *see also id.* at 73–

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<sup>4</sup> *See Shaw Indus. Grp. Inc. v. Automated Creel Sys., Inc.*, 817 F.3d 1293, 1300 (Fed. Cir. 2016) (discussing estoppel and distinguishing between the pre-institution phase and the *inter partes* review, which “does not begin until it is instituted.”). We express no opinion as to whether and to what extent estoppel would or would not apply in the hypothetical situation presented here.

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74 (Petitioner drawing a distinction between an institution decision under 35 U.S.C. § 314 and a final written decision under § 318). Regardless as to the reasons underlying Patent Owner's actions, it is because of those actions that the height limitation of claim 4 is again involved in this proceeding.

After consideration of the parties' arguments and because Patent Owner has not directed our attention to any statute, rule,<sup>5</sup> or legal precedent that supports its position, we decline to foreclose an opposition to the Motion to Amend from Petitioner.

#### *D. Patentability*

As discussed above, Patent Owner does not have the burden of persuasion with respect to the patentability of the substitute claim presented in its Motion to Amend. *See Aqua Products*, 872 F.3d at 1327; *see also* Guidance. We determine whether the substitute claim is unpatentable by a preponderance of the evidence based on the entirety of the record, including any opposition made by the petitioner. *See Aqua Products*, 872 F.3d at 1325–26; *see also* Guidance. For the reasons explained below, considering the entirety of the record before us, we determine that the preponderance of the evidence shows that the proposed substitute claim is not patentable over the prior art of record. Specifically, we determine that proposed substitute claim 9 is unpatentable at least under 35 USC § 103(a) as obvious over Simpson (discussed above) and the Intel Specification.

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<sup>5</sup> 37 C.F.R. § 42.20(d), under the heading "Petition and Motion Practice," states that "[t]he Board may order briefing on any issue involved in the trial." We have issued orders permitting briefing on the Motion to Amend. *See* Paper 8, 25, 29.

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*1. The Intel Specification*

The Intel Specification describes “the electrical and mechanical requirements for 168-pin, 3.3 volt, 64-bit and 72-bit wide, 4 clock, unbuffered Synchronous DRAM Dual In-Line Memory Modules (SDRAM DIMMs).” Ex. 1003, 7. “This specification largely follows the JEDEC<sup>[6]</sup> defined 168-pin unbuffered SDRAM DIMM as of JEDEC committee meeting of December 1996.” *Id.* The Intel Specification “give[s] the specific dimensions and tolerances for a 168-pin DIMM.” *Id.* at 11. The Intel Specification specifies that the overall length<sup>7</sup> of the DIMM module is in the range of 5.245 to 5.257 inches (133.22 to 133.52 mm) with a nominal dimension of 5.251 inches (133.37 mm), and that the overall height is in the range of 1.0 to 1.5 inches. Ex. 1003, 11, 13 (dimensions D1 and A, respectively); Ex. 1006, ¶¶ 96–98, 107–110.

*2. Proposed Substitute Claim 9 and the Combination of Simpson and the Intel Specification*

Petitioner opposes Patent Owner’s Motion to Amend, arguing that proposed substitute claim 9 is unpatentable as obvious over Simpson and the

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<sup>6</sup> According to Petitioner: “JEDEC stands for the ‘Joint Electron Device Engineering Council.’ JEDEC is a recognized standard setting body within the industry. Specifically, the JEDEC memory standards are the specifications for semiconductor memory circuits and similar storage devices promulgated by JEDEC.” Pet. 6 n.1.

<sup>7</sup> The printed circuit board “width” in the claims of the ’414 patent corresponds to the “length” of the board in the Intel Specification. *See* Ex. 1001, 4:12–13 (The ’414 patent explaining that “the length of the edge parallel to which the contact strip runs is called the board width.”); Ex. 1003, 11, 13 (Intel Specification Figure 1 depicting overall length dimension D1).



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Intel Specification. MTA Opp. 4–15.<sup>8</sup> Petitioner, with its Opposition to the Motion to Amend, submitted and relied upon additional declarations of Dr. Vivek Subramanian (Ex. 1016 and Ex. 1022). Patent Owner, in reply, argues that Simpson fails to disclose the “individually connected” limitation of claim 1 and that there was no motivation to utilize or modify Simpson’s layout. MTA Reply 10–11.

Proposed substitute claim 9 is the combination of the limitations of independent claim 1, which define the printed circuit board configuration, with the addition of the circuit board width of dependent claim 8 and the addition of the circuit board height of dependent claim 4.

In articulating its opposition, Petitioner relies on Simpson for the general teaching of a layout of memory chips on a circuit board and relies on the Intel Specification for disclosing a “known design standard for the height and width” to which to apply Simpson’s layout. MTA Opp. 5–6 (citing Ex. 1022 ¶¶ 17–18).

We have discussed the limitations of independent claim 1 above in the context of the challenge thereto in the Petition. The limitation of claim 8, now incorporated into proposed substitute claim 9, recites the “printed circuit board has a width of 5.25 inches.” Dr. Subramanian testifies credibly that “[b]y mid-2001, the dimensions of printed circuit boards had been

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<sup>8</sup> Petitioner’s Opposition also includes challenges based on the combination of Simpson and Karabatsos and the combination of Bechtolsheim, Tokunaga, and Karabatsos. Because we determine that the proposed substitute claim is unpatentable over the combination of Simpson and the Intel Specification, we do not reach the merits of Petitioner’s arguments concerning these other combinations.

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standardized for some time,” and points to the Intel Specification’s disclosure of the 5.25 inch dimension. Ex. 1006 ¶¶ 106–107; *see also* Ex. 1001, 4:53–55 (the ’414 patent acknowledging that “[t]his board width [of 5.25 inches] has gained acceptance in the case of memory module boards.”). We find that the claimed circuit board width was known in the art.

The limitation of claim 4, also now incorporated into proposed substitute claim 9, recites that the printed circuit board “has a height of 1 to 1.2 inches perpendicular to said contact strip.” The claimed range falls completely within the range disclosed in the Intel Specification. “[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a *prima facie* case of obviousness.” *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003). Petitioner persuasively argues and presents evidentiary support that there was a recognized market need for “low profile” memory modules, thus providing a reason for one of ordinary skill to target the claimed height range when designing a memory module. MTA Opp. 13–14 (citing Ex. 1016 ¶¶ 50–52, 56); *see* Ex. 1017 ¶¶ 27–28; Ex. 1006 ¶ 39; *id.* at ¶ 28 (the Karabatsos reference disclosing a “low profile DIMM” circuit board “having a height of approximately 1.2 inches, and a width of approximately 5.25 inches”).

Patent Owner does not ascribe any criticality to the claimed height range and does not dispute that that range was known in the art. *See, e.g.*, MTA Reply 10–11; Prelim. Resp. 42 (Patent Owner: “While the Intel Specification may disclose that its memory module has a height of 1.0 to 1.2 inches, such a disclosure in a completely different system that requires surface mounted DRAM chips, not socketed DRAM chips, does not mean

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that a POSITA would be able to arrange two rows of sockets in Simpson to limit its height to 1.0 to 1.2 inches.”); *but see* MTA 2 (Patent Owner arguing that the *combination* of component layout and height is absent in the prior art). Similarly, the ’414 patent matter-of-factly states that “[t]he printed circuit board preferably has a height of 1 to 1.2 inches perpendicular to the contact strip,” but does not state a basis for that preference. Ex. 1001, 4:7–8; *see also id.* at 6:50–56 (referring to the range in the same context as a standard DIMM design specification). Patent Owner, in the Motion to Amend, focuses on the layout of the circuit board while characterizing the height range merely as the result that flows from that layout. *See* MTA 2 (“The ’414 Patent . . . recognize[es] and utilize[es] unique features relating to the placements of the error correction chip and various passive elements on the Printed Circuit Board . . . [which] permitted the PCB height to be reduced to 1.0–1.2 inches . . .”).

We determine that Petitioner has provided an articulated reason with rational underpinning to support the conclusion of obviousness of subject matter having the recited width and height.

Petitioner, also relying on the testimony of Dr. Subramanian, demonstrates that an ordinary skilled artisan would have had a reasonable expectation of success. MTA Opp. 4–11 (citing Ex. 1006 ¶¶ 37–41; Ex. 1022 ¶¶ 17–30). Specifically, Petitioner persuasively shows that one of ordinary skill in the art would have been able to apply Simpson’s chip layout on a circuit board having the claimed width and height dimensions. *Id.*<sup>9</sup>

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<sup>9</sup> In reaching our determination, we do not rely on the Kiehl reference (Ex. 1020 (German application), Ex. 1021 (English translation)) or

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In reply to Petitioner's opposition, Patent Owner argues that the "housing . . . being individually connected" limitation incorporated from claim 1 is missing from the combination of Simpson and the Intel Specification. MTA Reply 10–11. Patent Owner asserts that "Simpson's alleged memory chips are connected to sockets, that are in turn connected to its printed circuit board," and thus, Simpson discloses an indirect connection. MTA Reply 10 (citing Ex. 1002, Fig. 1, 13:18-28). For the reasons set forth above in the discussion of claim construction, this argument is not persuasive, and we find that Simpson discloses memory housings individually connected to the circuit board.

Patent Owner also argues "[n]or was there motivation to utilize or modify Simpson's socketed invention as claimed." *Id.* at 11. Specifically, Patent Owner asserts that Simpson was concerned with an upgradable memory board and does not teach a reason for or benefit of the disclosed layout. *Id.* This argument is not persuasive. In an obviousness analysis, the prior art need not be directed to the same problem as the patentee and the references need not provide an explicit statement of motivation directed to the claimed subject matter. *See KSR Int'l. Co. v. Teleflex Inc.*, 550 U.S. 398, 418–20 (2007). Further, Patent Owner's argument, focusing only on the need discussed in Simpson, fails to address Petitioner's reasoning based on

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Dr. Subramanian's testimony pertaining thereto. Petitioner argues that "Kiehl provides clear evidence that memory chips existed contemporaneous to the '414 patent that would have permitted an arrangement of chips according to Simpson's pattern on a 5.25" by 1.2" PCB." MTA Surreply 7. However, Petitioner acknowledges that it is not alleging that Kiehl is prior art, merely "contemporaneous." *Id.* (asserting that certain applications were filed in Germany within two months of each other).

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the ordinary artisan's recognition of a need to have shorter memory boards and recognition that Simpson's layout was one possible choice applicable to low profile circuit boards (*see* MTA Opp. 5–6, 11–14).

Accordingly, we determine based on a preponderance of the evidence that proposed substitute claim 9 is unpatentable, under 35 U.S.C. § 103(a), as obvious over Simpson and the Intel Specification. For this reason, Patent Owner's Motion to Amend is *denied*.

#### IV. CONCLUSION

Petitioner has demonstrated by a preponderance of the evidence that claims 1 and 5–8 of the '414 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Simpson.

Additionally, we determine, based on a preponderance of the evidence in the entire trial record, that proposed substitute claim 9 is unpatentable, under 35 U.S.C. § 103(a), as obvious over Simpson and the Intel Specification.

#### V. ORDER

For the foregoing reasons, it is

ORDERED that claims 1 and 5–8 of the '414 patent have been proven to be unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Amend is *denied*; and

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

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Paper: 37  
Entered: April 12, 2018

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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KINGSTON TECHNOLOGY COMPANY, INC.,  
Petitioner,

v.

POLARIS INNOVATIONS LTD.,  
Patent Owner.

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Case IPR2016-01622  
Patent 6,850,414 B2

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Before SALLY C. MEDLEY, JEAN R. HOMERE,  
and KEN B. BARRETT, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION  
Denying Patent Owner's Request for Rehearing  
*37 C.F.R. § 42.71(d)*

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## I. INTRODUCTION

On March 7, 2018, Polaris Innovations Ltd. (“Patent Owner”) filed a Request for Rehearing (Paper 36, “Request” or “Req. Reh’g”) of our Final Written Decision (Paper 35, “Final Dec.”), particularly our denial of Patent Owner’s Motion to Amend (Paper 18, “Mot. to Amend”) U.S. Patent No. 6,850,414 B2 (“the ’414 patent,” Ex. 1001). Concurrent with its Request for Rehearing, Patent Owner filed Exhibit 2015. For the reasons provided below, Patent Owner’s Request for Rehearing is *denied*. We also expunge Exhibit 2015.

## II. SUGGESTION FOR PANEL EXPANSION

In its Request, Patent Owner “suggests that the panel ‘suggest to the Chief Judge the need for the designation of an expanded panel’” before consideration of the Request. Req. Reh’g 3 (citing PTAB Standard Operating Procedure (SOP) 1).

Standard Operating Procedure 1 identifies some of the reasons for which the Chief Judge may expand a panel. PTAB SOP 1, 3 (§ III.A). For example, an expanded panel may be appropriate when “[t]he proceeding or AIA Review involves an issue of exceptional importance” or when “[c]onsideration by an expanded panel is necessary to secure and maintain uniformity of the Board’s decisions.” *Id.* (§ III.A.1, 2).

In this case, the Chief Judge has considered Patent Owner’s suggestion for an expanded panel, but has determined that an expanded panel is not warranted.



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### III. ANALYSIS

A party requesting rehearing bears the burden of showing that the decision should be modified. 37 C.F.R. § 42.71(d). “The request must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply.” *Id.* When rehearing a decision on a petition, we review the decision for an abuse of discretion. 37 C.F.R. § 42.71(c).

Patent Owner’s Motion to Amend proposed to substitute a newly-presented claim 9 for dependent claim 8 and sought to cancel all the instituted challenged claims. Patent Owner requests reconsideration regarding both aspects of the Motion to Amend. Req. Reh’g 1.

#### *A. Arguments Regarding Proposed Substitute Claim 9*

As an initial matter, we note that Patent Owner’s current arguments regarding the proposed substitute claim focus almost exclusively on policy and procedural matters rather than our substantive determination that proposed substitute claim 9 is unpatentable. *See, e.g.*, Req. Reh’g 7–8. Patent Owner, in effect, argues that it was erroneous for us to consider any arguments or evidence not in the Petition in evaluating the patentability of the proposed substitute claim. *See, e.g., id.* at 10 (quoting Final Dec. 21) (Patent Owner asserting that “[t]he FWD’s [Final Written Decision’s] suggestion that it must always determine whether the substitute claim is patentable ‘based on the entirety of the record, including any opposition made by the petitioner’” is incorrect in this case.) (citations omitted). In so arguing, Patent Owner does not direct our attention to any matter we misapprehended or overlooked.

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Patent Owner argues: “As for the FWD’s denial of [the Motion to Amend as to] proposed substitute Claim 9, it misapprehended the Board’s sole prior decision on point, *Amerigen Pharmaceuticals v. Shire*, IPR2015-02009, Paper 38 (PTAB Mar. 31, 2017), and the law that it applied.” Req. Reh’g 1; *see also id.* at 9 (arguing that we overlooked or misapprehended that decision “and the law it applied”). As to that “law,” Patent Owner contends that the Final Decision “cannot be squared with *Amerigen*’s central holding that IPR has no requirement to *re*-prove the patentability of subject matter of non-instituted claims.” *Id.* at 10; *see also id.* at 2 (characterizing the holding of *Amerigen* as pertaining to there being no requirement for a patent owner to prove original, non-amended claims are patentable). Patent Owner, however, does not point to any portion of the Final Decision that could be construed as placing a requirement on Patent Owner to prove patentability. *Cf.* Final Dec. 7, 15, 21 (indicating the applied legal framework where the burden is *not* on the patent owner to prove patentability). We addressed, in the Final Decision, Patent Owner’s arguments regarding *Amerigen*, Final Dec. 19–20, and determined that “*Amerigen* does not, as Patent Owner implies, establish a procedural rule that precludes a petitioner from opposing a motion to amend,” *id.* at 20. Contrary to Patent Owner’s arguments, we did not misapprehend or overlook its arguments; rather, we disagreed with Patent Owner’s position. We note that merely disagreeing with our analysis or conclusions does not serve as a proper basis for a rehearing. It is not an abuse of discretion to provide analysis or conclusions with which a party disagrees.

Patent Owner argues, with emphasis added: “The FWD further overlooks or misapprehends contrary Board practice and law in post-grant

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*inter partes reexamination*, which, as Patent Owner and the Federal Circuit’s judges have explained, should guide the Board in interpreting the requirements for amending patents in IPR.” Req. Reh’g (citing Paper 33, 27). Similarly, Patent Owner argues that the “conclusion” reached in the Final Decision “is just the opposite of what happens in *inter partes reexamination*.” *Id.* at 12 (emphasis added) (citing Paper 33, 27-28; Paper 34, 98:19-99:10). The cited sources of this argument, Papers 33 and 34, are, respectively, Patent Owner’s demonstrative exhibits for the hearing and the hearing transcript. The Request does not identify where in the record this matter—concerning *inter partes* reexamination practice as opposed to that of *inter partes* review—was raised in a brief or other substantive paper. Thus, this appears to be improper argument raised for the first time at the hearing<sup>1</sup> or appearing for the first time in a demonstrative exhibit slide that was not even discussed at the hearing.<sup>2</sup> We could not have, in the Final Decision, overlooked or misapprehended briefing made for the first time in the present Request and after the issuance of the Final Decision.

Patent Owner argues that “[t]he FWD’s holding not only misapprehends past reexamination practice, Board decisions, and Federal Circuit guidance: it misapprehends IPR’s statutory structure” and that “the

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<sup>1</sup> The cited portion of the hearing transcript indicates that the few sentences contained little argument and were more of an invitation for the panel to explore the matter on its own. *See* Hearing Tr. (Paper 34), 98:19–21 (“So I’m almost out of time, but just quickly, they say, well, you should actually look to *inter partes* reexamination proceedings as the backdrop.”).

<sup>2</sup> We note that Patent Owner was given the opportunity to provide the last word during briefing, and did file a paper titled “Patent Owner’s Brief Addressing Impact of *Aqua Products v. Matal*” (Paper 30).

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FWD overlooks the unfairness of its rule to patent owners.” Req. Reh’g 13, 15 (citing Paper 23 (Patent Owner’s Reply to Petitioner’s Opposition to Motion to Amend) and Paper 33 (Patent Owner’s demonstrative exhibits)). These arguments appear to be a reiteration of Patent Owner’s assertions premised on the incorrect belief that we ruled conclusively on patentability of a dependent claim at the institution phase, or, as characterized in the Request, the purported “exclusion of non-instituted Claim 4 from trial.” *Id.* at 15; *see id.* at 2 (referring to “the patentability of the subject matter of non-instituted claims, notwithstanding that it had been excluded from trial at institution.”). Similarly, Patent Owner is using this Request as an opportunity to reargue its position that Petitioner should have presented all its arguments against the Motion to Amend in the Petition, prior to institution of a trial and well before the Motion was filed. *See id.* at 10, 13, 14, 15 (repeatedly referring to “unpetitioned attacks” (or similar) on the substitute claim proposed in the later-filed Motion to Amend). To the extent that these arguments were raised in substantive briefs, we considered those arguments in reaching the Final Decision. *See* Final Dec. 16–21. Patent Owner has not directed our attention to any briefed argument in this regard that we overlooked or misapprehended. Any of these arguments not made in substantive briefing could not have been overlooked or misapprehended. *See* Req. Reh’g 14 (citing the hearing transcript (Paper 34) and Exhibit 2015 filed concurrently with the present Request for Rehearing); *id.* at 15 (citing Paper 33 (Patent Owner’s demonstrative exhibits)).

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*B. Arguments Regarding the Proposed Cancellation of  
All the Challenged Instituted Claims*

Patent Owner argues that we “erred in denying the Motion to Amend’s noncontingent request to cancel Claims 1 and 5-8.” Req. Reh’g 3. Patent Owner faults us for first determining—before moving on to consideration of Patent Owner’s Motion to Amend—whether Petitioner had met its burden to prove the unpatentability of the challenged and instituted claims. *See id.*<sup>3</sup> In effect, Patent Owner faults us for not treating the two components of the single proposed amendment<sup>4</sup> as severable and for not analyzing the motion in a piecemeal fashion.

Patent Owner has not identified where the matter was raised such that we misapprehended or overlooked it. Specifically, Patent Owner does not identify where it previously stated, argued, represented, or requested that the cancellation portion of the Motion to Amend be treated as “noncontingent” or as severable from the portion of the motion seeking to substitute a new claim. *Contra* Mot. to Amend 2 (listing together “the proposed claim cancellations and amendments . . . .”); *id.* at 5 (concluding with simply “Patent Owner respectfully requests that its Motion To Amend be granted.”); Paper 33, Slide 7 (Patent Owner’s demonstrative exhibits for the hearing include a slide titled “Issues For Oral Argument” that states “Motion To

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<sup>3</sup> In the Final Decision, we determined that the claims Patent Owner seeks to have canceled are unpatentable. Final Dec. 27. 35 U.S.C. § 318 provides: “If the Patent Trial and Appeal Board issues a final written decision . . . and the time for appeal has expired or any appeal has terminated, the Director shall issue and publish a certificate canceling any claim of the patent finally determined to be unpatentable . . . .”

<sup>4</sup> *Cf.* 37 C.F.R. § 42.121 (c) (providing for an additional motion to amend in certain circumstances).

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Amend: . . . *cancel* instituted Claims 1, 5-8, *add* substitute Claim 9.”). Further, Patent Owner, in addition to seeking cancelation of independent claim 1, presented arguments that independent claim 1 was patentably distinct over the prior art of record. Reply to Petitioner’s Opposition to Motion to Amend (Paper 23) 10–12. Thus, in light of the ambiguous record, we opted to analyze Petitioner’s case regarding patentability of the challenged claims, including consideration of Patent Owner’s arguments directed to the patentability of independent claim 1, before reaching Patent Owner’s Motion to Amend. Final Dec. 11. We thereafter denied the Motion to Amend because the proposed substitute claim was not patentable. *Id.* at 27. Where Patent Owner did not request separate treatment of the cancelation and substitution portions of the Motion, we could not have misapprehended or overlooked such a request.

Patent Owner argues that we “overlooked 35 U.S.C. § 316(d).” Req. Reh’g at 1. The basis for Patent Owner’s assertion is not readily clear. That provision provides that a patent owner may file a motion to amend to cancel and/or substitute claims. Such a motion was filed and considered, and thus we did not overlook Section 316(d).

Patent Owner argues that our treatment of the Motion to Amend “contradict[s] all prior Board decisions on point.” Req. Reh’g 3. Specifically, Patent Owner argues “[i]n every such previous case, no matter what the stage of trial and regardless whether the patent owner filed a response to the petition, the Board has granted the patent owner’s request

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and canceled the claims without entering adverse judgment.”<sup>5</sup> *Id.* at 5 (citing, *inter alia*, IPR2016-01600, Paper 35; IPR2016-01186, Paper 61). Patent Owner’s own characterization of those cases as having “considered noncontingent requests in motions to amend to cancel fewer than all claims for trial” (*id.* at 4) highlights the distinction between those cases and the situation before us. *See, e.g.*, IPR2016-01600, Paper 16 (clearly stating: “This motion to amend is not contingent on a determination that the original claims are unpatentable.”); IPR2016-01186, Papers 29, 61 (granting “a non-contingent Motion to Amend . . . requesting [only] cancellation of claims 1, 3, 5, and 7.”). As mentioned, Patent Owner never clearly and unambiguously identified the cancellation portion of its Motion as “noncontingent.”

Similarly, Patent Owner misplaces reliance on *Liberty Mut. Ins. v. Progressive Cas. Ins.*, CBM2013-00002, Paper 27 at 2 (PTAB May 14, 2013) for the proposition that “the Board has consistently held that requests to cancel some of the triable claims ‘will be entered, as it will reduce issues and streamline the trial,’ and render the patentability of the canceled claims

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<sup>5</sup> In apparent contradiction to its implied assertion that the two aspects of its Motion to Amend stand independently of each other, Patent Owner’s arguments in the Request suggest it strategically tied together the proposed substitute claim to the cancellation of all the instituted claims in an attempt to avoid its actions being construed as a request for adverse judgment. *See, e.g.*, Req. Reh’g 6–7 (implying that an entry of “adverse judgment” is only appropriate where the motion seeks cancellation of all challenged claims without proposing a substitute claim); *see also* 37 C.F.R. § 42.73(b)(2) (“Actions construed to be a request for adverse judgment include . . . [c]ancellation or disclaimer of a claim such that the party has no remaining claim in the trial.”).

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moot by taking the canceled claims entirely out of the case.” Req. Reh’g 4. The cited Paper 27 of *Liberty Mutual* is a summary of a conference call where Patent Owner explicitly indicated to the panel the desire to immediately cancel three claims out of the fifty-nine challenged and where no substitute claim was being proposed. *Liberty Mut. Ins. v. Progressive Cas. Ins.*, CBM2013-00002, Papers 27, 28 (the motion itself). In the case before us, Patent Owner did not simply move to immediately cancel claims, but tied to that a request to add a substitute claim, and then continued to maintain, after filing the Motion to Amend, that independent claim 1—a claim requested to be canceled—was patentably distinct over the prior art. We did not abuse our discretion in considering such arguments.

#### IV. EXHIBIT 2015

Patent Owner filed Exhibit 2015 concurrently with its Request for Rehearing. That exhibit appears to be an article published on the internet and is dated March 5, 2018, a month after the issuance of the Final Decision. Patent Owner cites the exhibit as “press coverage” regarding briefing being allowed by other panels in other cases involving motions to amend. Req. Reh’g 14. The filing of Exhibit 2015, which was not in the record at the time of the Final Decision, is unnecessary to deciding the merits of Patent Owner’s Request for Rehearing, and Patent Owner has not shown good cause for admitting the exhibit now. For these reasons, we expunge Exhibit 2015 pursuant to our authority under 37 C.F.R. § 42.7(a). *See also* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,768 (Aug. 14, 2012) (“Evidence not already of record at the time of the decision will not be admitted [with a Rehearing Request] absent a showing of good cause.”).



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V. ORDER

For the foregoing reasons, it is

ORDERED that Patent Owner's Request for Rehearing is *denied*.

FURTHER ORDERED that Exhibit 2015 is *expunged*.

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Paper: 42  
Entered: June 11, 2018

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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KINGSTON TECHNOLOGY COMPANY, INC.,  
Petitioner,

v.

POLARIS INNOVATIONS LTD.,  
Patent Owner.

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Case IPR2016-01622  
Patent 6,850,414 B2

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Before SALLY C. MEDLEY, JEAN R. HOMERE,  
and KEN B. BARRETT, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

ORDER  
Granting Petitioner's Request for Rehearing and  
Denying Petitioner's Motion to Limit the Petition  
*37 C.F.R. § 42.71(a), (d)*

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## I. INTRODUCTION AND SUMMARY OF THE DECISION

Kingston Technology Company, Inc. (“Petitioner”) “requests rehearing [of the Final Written Decision (Paper 35, “Final Dec.”)] to address the effects of the Supreme Court’s decision on *SAS Inst., Inc. v. Iancu*, 584 U.S. \_\_\_ (U.S. Apr. 24, 2018) on this trial, prior to the matter going to any appeal.” Paper 40 (“Petitioner’s Request” or “Pet. Req. Reh’g”), 1. No challenge of claims 2–4 was instituted in the original Institution Decision (Paper 7, “Inst. Dec.”). The Final Written Decision did not include an explicit conclusion as to the patentability of those claims, but did include an analysis of proposed substitute claim 9, which includes the subject matter of claim 4. As part of its submission, Petitioner includes a motion requesting “that the Board limit the petition to exclude review of claims 2 and 3.” *Id.* at 1. Petitioner requests that the Final Written Decision be modified to include a decision with respect to the patentability of claim 4 and of claims 2 and 3 “to the extent [the Petition is] not limited.” *Id.* at 1–2.

After considering Petitioner’s Request and the response of Patent Owner Polaris Innovations Ltd. (Paper 41, “PO Resp. Req. Reh’g”), we: 1) grant Petitioner’s request for rehearing, 2) modify the institution decision to institute on all of the challenged claims and all of the grounds presented in the Petition, 3) deny Petitioner’s motion to limit the Petition, and 4) modify the Final Written Decision to include our determination that Petitioner has demonstrated by a preponderance of the evidence that claim 4 is unpatentable and that Petitioner has *not* demonstrated by a preponderance of the evidence that claims 2 and 3 are unpatentable.

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## II. PROCEDURAL POSTURE

Petitioner filed a Petition requesting *inter partes* review of claims 1–8 of U.S. Patent No. 6,850,414 B2 (“the ’414 patent,” Ex. 1001). Paper 2. Patent Owner filed a Preliminary Response to the Petition. Paper 6. The Board instituted *inter partes* review of claims 1 and 5–8 on the ground of obviousness under 35 U.S.C. § 103(a) over Simpson. Paper 7, 23. The Board did not institute a review as to dependent claims 2–4 and did not institute on all grounds. *Id.* at 6, 23. Specifically, the instituted review did not include Petitioner’s obviousness challenge of claims 1–8 based on the combination of Simpson and the Intel Specification, or Petitioner’s obviousness challenge of claims 1–8 based on the Intel Specification. Petitioner filed a Request for Rehearing of The Board’s Institution Decision on Claim 4 (Paper 11), which was denied (Paper 16).

Petitioner filed another petition seeking *inter partes* review of claim 4 of the ’414 patent in Patent Trial and Appeal Board Case IPR2017-00974 (Paper 2). In that case, the Board exercised its discretion under 35 U.S.C. §§ 314(a) and 325(d) to not institute an *inter partes* review. IPR2017-00974, Paper 8. Petitioner’s request for rehearing of that decision was denied. IPR2017-00974, Papers 9, 11.

In the present proceeding and subsequent to the institution decision, Patent Owner filed a Motion to Amend (“MTA,” Paper 18) seeking to cancel the instituted challenged claims and proposing to substitute a newly-presented claim 9 for dependent claim 8. Patent Owner characterized the proposed substitute claim 9 as “the same as challenged claim 8 in every respect, except that it simply adds the limitations of claim 4 . . . .” MTA 1. Patent Owner did not file a Response to the Petition. Subsequently,

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Petitioner filed an Opposition to Patent Owner’s Motion to Amend (Paper 20), and Patent Owner filed a Reply to Petitioner’s Opposition to Motion to Amend (Paper 23). Petitioner filed a Surreply to Patent Owner’s Motion to Amend (Paper 28). Thereafter Patent Owner filed a Brief Addressing Impact of *Aqua Products v. Matal*<sup>1</sup> (Paper 30). An oral hearing was held on November 14, 2017. *See* Paper 34 (Hearing Transcript).

On February 5, 2018, the Board issued a Final Written Decision. Paper 35. In that Decision, we determined that Petitioner had demonstrated by a preponderance of the evidence that claims 1 and 5–8 of the ’414 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Simpson. Additionally, we determined, based on a preponderance of the evidence in the entire trial record, that proposed substitute claim 9 is unpatentable, under 35 U.S.C. § 103(a), as obvious over Simpson and the Intel Specification. Patent Owner filed, on March 7, 2018, a request for rehearing of the Final Written Decision (Paper 36), which was denied on April 12, 2018 (Paper 37).

On April 24, 2018, the Supreme Court held that a decision to institute under 35 U.S.C. § 314 may not institute on less than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 2018 WL 1914661, at \*10 (U.S. Apr. 24, 2018).

On May 8, 2018, Petitioner sent to the Board and Patent Owner an email stating, in pertinent part: “Pursuant to the guidance provided by the Chief Judge in his recent webinar on *SAS*, Petitioner requests a conference call to ask permission to file an out of time request for reconsideration

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<sup>1</sup> *Aqua Products, Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017).

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seeking institution and a FWD on non-instituted claim 4 in [this] IPR.”  
Ex. 3002. Later that same day, Patent Owner replied: “Patent Owner is prepared to explain why Petitioner’s proposed request should not be authorized pursuant to the guidance provided on *SAS*.” *Id.* On May 11, 2018, Judges Barrett and Homere participated in a conference call with the parties to discuss the parties’ positions regarding Petitioner’s request. A transcript of that call has been filed as Exhibit 1026.

On May 21, 2018, we granted Petitioner’s request to excuse the lateness of the filing of a request for rehearing, authorized Petitioner to file a request for rehearing, authorized Patent Owner to file an opposition thereto, and authorized the parties to file a Joint Motion to Limit the Petition by removing specific claims and grounds upon which we did not institute review in the original Decision on Institution. Paper 39, 8.

### III. ANALYSIS OF PETITIONER’S REQUEST FOR REHEARING

A party requesting rehearing bears the burden of showing that the decision should be modified. 37 C.F.R. § 42.71(d). Petitioner argues that we should modify the Final Written Decision, in light of the Supreme Court’s decision in *SAS Inst., Inc. v. Iancu*, 2018 WL 1914661, at \*10 (U.S. Apr. 24, 2018), to address all of the claims challenged in the Petition. Pet. Req. Reh’g 1–2. *SAS* issued after the Final Written Decision in this case but before the expiration of the time for the parties to appeal that decision. Petitioner argues that addressing the previously non-instituted claims now, rather than upon a remand from an appeal, will be the more efficient result and will conserve time and resources. *See* Req. Reh’g 5; Ex. 1026 (Conference Call Transcript), 4:13–5:2, 21:18–22:22.

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Patent Owner argues, *inter alia*, that the Board has been divested of jurisdiction to grant Petitioner’s request, that Petitioner “forfeited” or waived any argument against partial institution by not raising it earlier, and that Petitioner’s Request fails to identify anything we misapprehended or overlooked. PO Resp. Req. Reh’g 1–4. We have considered all of Patent Owner’s arguments, including but not limited to these, and do not find them persuasive.

As to jurisdiction, Patent Owner impliedly argues that the expiration of the time to file a request for rehearing without prior authorization renders the judgment final and divests the Board of jurisdiction over the proceeding. *Id.* at 2 (citing 37 C.F.R. § 42.71(d)(2)). Patent Owner, in its analysis, fails to acknowledge that 37 C.F.R. § 90.3 establishes the deadline for the filing of an appeal, not the rule regarding the timing of a request for reconsideration. That deadline was reset by Patent Owner’s request for rehearing (Paper 36) to sixty-three days from the denial of that request (Paper 37) on April 12, 2018. As of this time, we understand that neither party has filed a notice of appeal. *See* Ex. 1026 (Conference Call Transcript), 8:19–22 (Patent Owner’s counsel stating: “It’s already been an appealable decision in this case, but the deadline is ticking set by the director. And, frankly, a notice of appeal could already have been filed.”). We have jurisdiction to reconsider our Final Written Decision in light of *SAS*.

We do not find Patent Owner’s waiver argument to be persuasive, and we decline to reject the Request for Reconsideration based on an alleged waiver or forfeiture. As for Patent Owner’s argument that the Request fails to identify anything we misapprehended or overlooked, we deem



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Petitioner’s *SAS*–based argument to constitute an adequate allegation that we erred by limiting the scope of the instituted trial.

In light of *SAS* and in consideration of expediency and of the conservation of resources, we grant Petitioner’s Request for Rehearing. Accordingly, we now reconsider our issuance of a Final Written Decision addressing the patentability of less than all the claims challenged in the Petition.

#### IV. MODIFICATION OF THE INSTITUTION DECISION

As mentioned, the Board, in the original Institution Decision, did not institute a review as to dependent claims 2–4 and did not institute on all grounds. On April 24, 2018, the Supreme Court, held that a decision to institute under 35 U.S.C. § 314 may not institute on less than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 2018 WL 1914661, at \*10 (U.S. Apr. 24, 2018). In our Decision on Institution, we determined that Petitioner demonstrated a reasonable likelihood that it would establish that at least one of the challenged claims of the ’414 patent is unpatentable. Paper 7, 23. We modify our institution decision to institute on all of the challenged claims and all of the grounds presented in the Petition. *See Guidance on the Impact of SAS on AIA Trial Proceedings* (April 26, 2018), available at <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial>.

#### V. ANALYSIS OF PETITIONER’S MOTION TO LIMIT THE PETITION

In our Order of May 21, 2018, we noted that “Petitioner primarily is requesting the institution of and a final written decision regarding originally non-instituted claim 4,” and we asked the parties to indicate clearly their

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respective position with regard to originally non-instituted claims 2 and 3. Paper 39, 7. We also suggested that the parties consider, for example, filing a request for partial adverse judgment concerning some of the originally non-instituted claims or filing a Joint Motion to Limit the Petition by removing specific claims and grounds upon which we did not institute review in the original Decision on Institution. *Id.* No such joint motion was filed, and Petitioner represents that Patent Owner indicated that it opposes removing claims 2 and 3 from the Petition and of “exclude[ing] review of claims 2 and 3.” Pet. Req. Reh’g 1; *see* PO Resp. Req. Reh’g (Patent Owner arguing that Petitioner’s “unilateral” motion is unauthorized).

Petitioner’s motion is little more than a prayer for relief. *See* Pet. Req. Reh’g 1 (“Patent Owner opposes [removing claims 2 and 3 from the Petition]. Thus, Kingston moves (at least on its own) that the Board limit the petition to exclude review of claims 2 and 3.”). Petitioner offers no persuasive argument as to why we should now allow Petitioner—in the face of opposition from Patent Owner—to withdraw claims 2 and 3 from consideration and thereby to avoid a Final Written Decision on Petitioner’s patentability challenges to those claims.

We deny Petitioner’s motion to limit the Petition.

## VI. MODIFICATION OF THE FINAL WRITTEN DECISION

### *A. Claims 2 and 3*

Claims 2 and 3 each depend directly from independent claim 1, which recites “[a]n electronic printed circuit board configuration.” Ex. 1001, 7:24, 8:4–19. Dependent claim 2 pertains to the position of the error correction chip relative to a semiconductor memory on the circuit board. *Id.* at 8:4–8. Dependent claim 3 pertains to the height of the circuit board as a function of

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the dimensions of the error correction chip and the circuit board's contact strip. *Id.* at 8:10–19.

The Petition challenges dependent claims 2 and 3 on three obviousness grounds—1) over Simpson alone, 2) over Simpson and the Intel Specification, and 3) over the Intel Specification alone. Pet. 8–9. Patent Owner filed a Preliminary Response presenting arguments specifically directed to claims 2 and 3. *See, e.g.*, Prelim. Resp. 34–38.

In the original Institution Decision, we considered the arguments by both parties concerning claims 2 and 3, and we determined that Petitioner had not met its burden as to those claims. Regarding Petitioner's challenge of claims 2 and 3 as being obvious over Simpson, we determined that “Petitioner has not explained sufficiently *why* a person of ordinary skill in the art would have modified Simpson . . . [and] on the record before us, we are not persuaded that Petitioner has provided an articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” Inst. Dec. 16; *see id.* (noting that Petitioner, for claim 3, relied on the same proposed modification as for claim 2). For similar reasons—and specifically due to a lack of adequate articulated reasoning to combine or modify the references—we determined that Petitioner had not established a reasonable likelihood of prevailing on the other two asserted grounds. *See id.* at 17–18, 20–22.

Petitioner Kingston now affirmatively states that “Kingston disclaims any challenge to claims 2 and 3 and therefore presents no briefing on them here.” Pet. Req. Reh'g 1; *cf.* PO Resp. Req. Reh'g 10 (arguing that we must find claims 2 and 3 not unpatentable based on this disclaimer).

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In light of Petitioner's disclaimer of any challenge to claims 2 and 3 and for the reasons set forth in the Institution Decision, we determine that Petitioner has *not* shown by a preponderance of the evidence that dependent claims 2 and 3 are unpatentable. We modify the Final Written Decision accordingly.

*B. Claim 4*

Claim 4 depends directly from independent claim 1<sup>2</sup> and pertains to the height of the circuit board of claim 1. Specifically, claim 4 recites: "The printed circuit board according to claim 1, wherein: said printed circuit board has a height of 1 to 1.2 inches perpendicular to said contact strip." Ex. 1001, 8:20–21.

As discussed in the Final Written Decision, a trial was not originally instituted as to claim 4 primarily because we determined Petitioner had not provided in the Petition an adequate articulation of a reason to combine or modify the references. Final Written Decision 16–19. Nonetheless, claim 4 and its subject matter have been discussed repeatedly throughout the trial. After the original Institution Decision and at a relatively early stage of this proceeding, Patent Owner moved to amend by proposing substitute claim 9. MTA (Paper 18) 2. As characterized by Patent Owner, that proposed substitute claim 9 is "the same as challenged [dependent] claim 8 in every respect, except that it simply adds the limitations of claim 4 . . ." MTA 1. Proposed substitute claim 9 is the combination of the limitations of

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<sup>2</sup> A trial was instituted as to the Petitioner's challenge of independent claim 1 and Patent Owner opted to not file a Patent Owner Response to the Petition. Final Written Decision 11. We have determined that Petitioner had proven the unpatentability of independent claim 1. *Id.* at 11–14, 27.

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independent claim 1, which define the printed circuit board configuration, with the addition of the circuit board width of dependent claim 8 and the addition of the circuit board height of dependent claim 4. Thus, claim 4 is broader than proposed substitute claim 9 in that claim 4 recites a height limitation but not a width limitation. By proposing the substitute claim, Patent Owner placed at issue the patentability of the subject matter of claim 4. The arguments in the Motion to Amend clearly reflect Patent Owner's belief that the inclusion of the subject of claim 4 (the height limitation) in the proposed substitute claim is that which rendered the proposed substitute claim patentable. *See* MTA 3–4. The Motion to Amend refers to claim 4 explicitly or its height limitation at least a dozen times. *See* MTA 1–4. Thus, there can be no question that Patent Owner was on notice at least as early as its filing of the Motion to Amend that the subject matter of claim 4 would be an issue for trial.

Patent Owner was given many opportunities to address the patentability of the subject matter of the proposed substitute claim 9, including the opportunity to respond to Petitioner's challenges, which necessarily involved addressing the subject matter of claim 4. For example, Patent Owner filed a reply to Petitioner's opposition to the motion to amend, where Petitioner specifically addressed claim 4 and its subject matter. *See* Paper 20, 1–14 (Petitioner's Opposition); *id.* at 9 (“Therefore, substitute claim 9 (and indeed original claim 4) of the '414 Patent are not patentable under 35 § U.S.C. 103.”); Paper 23, 3 (Patent Owner's Response to Petitioner's Opposition, arguing incorrectly that the limitation of claim 4 is “a limitation the Board has already repeatedly found was not in the references raised by Petitioner.”). Patent Owner opted to utilize much of its

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opportunities by making procedural arguments, although it did make some substantive arguments primarily directed to limitations of the underlying independent claim 1. *See, e.g.*, Paper 23, 9 (arguing that Petitioner failed to show the unpatentability of claim 4 earlier and should not be allowed to challenge the subject matter of claim 4 after the Decision on Institution); *id.* at 10–12 (arguing, *inter alia*, the “individually connected” limitation of claim 1). In addition to briefing, Patent Owner had the opportunity to address the subject matter of claim 4 at the oral argument. *See, e.g.*, Paper 34 (hearing transcript), 86:19–87:2 (Counsel for Patent Owner: “But you could also say that [the proposed substitute claim is] identical to claim 4 except that it adds an additional limitation that was already found in claim 8. In other words, it is like a narrowed claim 4, and claim 4 was already denied institution.”); *id.* at 87:22–88:9.

We are not persuaded by Patent Owner’s argument that it never had the opportunity to respond to the institution of a trial on claim 4. PO Resp. Req. Reh’g 7. It was Patent Owner’s actions that placed the subject matter of claim 4 at issue in the trial after we initially denied a review of that claim. Thus, it is Patent Owner that, in some sense, instituted a review of the subject matter of claim 4. As discussed above, that review began at a relatively early stage of the trial and Patent Owner had several opportunities to respond to Petitioner’s arguments after placing the subject matter of claim 4 again before us for review.

We agree with Petitioner that this case is atypical and that, on the record developed during trial, we may proceed to a final decision as to the patentability of claim 4 without the need for further briefing. Pet. Req. Reh’g 2. We do not find persuasive Patent Owner’s argument that we

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should consider nothing in the record other than the argument and evidence submitted with the Petition. *See* PO Resp. Req. Reh’g 5–7; *see also* Ex. 1026 (Conference Call Transcript), 28:15–22 (proposing that all post-institution filings be expunged). The post-institution evidence and arguments pertaining to the subject matter of claim 4 came into the record as a direct result of Patent Owner reintroducing that subject matter into the trial, not as a unilateral attempt by Petitioner to shore up the Petition. We similarly do not find persuasive Patent Owner’s argument that we should limit our consideration to a single ground that is different than the ground upon which Petitioner demonstrated the unpatentability of the proposed amended claim 9. PO Resp. Req. Reh’g 8–10. We consider the entirety of the record in evaluating the patentability of claim 4.

In the Final Written Decision, “we determine[d], based on a preponderance of the evidence in the entire trial record, that proposed substitute claim 9 is unpatentable, under 35 U.S.C. § 103(a), as obvious over Simpson and the Intel Specification.” Final Written Decision 27. In arriving at that determination, we necessarily analyzed the patentability of the subject matter of dependent claim 4, which, as mentioned, is broader in scope than that of proposed substitute claim 9. *See id.* at 11–14 (patentability of the underlying independent claim 1); *id.* at 21–27 (patentability of proposed substitute claim 9, including a specific analysis of the height limitation of claim 4 beginning on page 24). Although we did not identify explicitly claim 4 as unpatentable in the conclusion or order of the Final Written Decision, we, nonetheless, effectively ruled on the patentability of that claim. *See* Pet. Req. Reh’g 2.

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We determine, for the reasons set forth in the Final Written Decision, that Petitioner has shown by a preponderance of the evidence that claim 4 is unpatentable as obvious over Simpson and the Intel Specification.<sup>3</sup> We modify the Final Written Decision accordingly.

#### VII. CONCLUSION

We determine, on the facts of this case and because Petitioner seeks SAS-based action, that it is appropriate for us to reconsider our Final Written Decision and to modify that decision so as to explicitly address the patentability of all claims challenged in the patent. Therefore, with respect to claims 2–4 of the '414 patent, we modify the conclusion in our Final Written Decision as follows: 1) Petitioner has *not* demonstrated by a preponderance of the evidence that claims 2 and 3 of the '414 patent are unpatentable under any ground asserted in the Petition; and 2) Petitioner has demonstrated by a preponderance of the evidence that claim 4 of the '414 patent is unpatentable, under 35 U.S.C. § 103(a), as obvious over Simpson and the Intel Specification.

#### VIII. ORDER

For the foregoing reasons, it is

ORDERED that Petitioner's request for rehearing is *granted*;

FURTHER ORDERED that our institution decision is modified to include review of all challenged claims and all grounds presented in the Petition;

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<sup>3</sup> Because this determination is dispositive, we do not reach any other ground asserted against claim 4.



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FURTHER ORDERED that Petitioner's Motion to Limit the Petition is *denied*;

FURTHER ORDERED that claims 2 and 3 of the '414 patent have *not* been proven to be unpatentable;

FURTHER ORDERED that claim 4 of the '414 patent is unpatentable;

FURTHER ORDERED that the Final Written Decision is modified to include the analysis set forth above regarding the patentability of claims 2–4.

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(12) **United States Patent**  
**Benisek et al.**

(10) **Patent No.:** US 6,850,414 B2  
(45) **Date of Patent:** Feb. 1, 2005

(54) **ELECTRONIC PRINTED CIRCUIT BOARD HAVING A PLURALITY OF IDENTICALLY DESIGNED, HOUSING-ENCAPSULATED SEMICONDUCTOR MEMORIES**

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**Martin Schober**, Gröbenzell (DE)  
(73) Assignee: **Infineon Technologies AG**, Munich (DE)  
(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 374 days.

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Internal Publication: "Platinenlayout Nr. ASE0015 im Gerber-Format" [Mounting Plate-Layout No. ASE0015 in Gerber-Format], IBM, picture 1.

(21) Appl. No.: **10/187,763**  
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(65) **Prior Publication Data**

\* cited by examiner

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(30) **Foreign Application Priority Data**

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Jul. 2, 2001 (DE) ..... 101 31 939  
(51) **Int. Cl.**<sup>7</sup> ..... **H05K 1/00**; H05K 1/18;  
H05K 1/16; H05K 7/02; H05K 7/06  
(52) **U.S. Cl.** ..... **361/748**; 361/760; 174/260  
(58) **Field of Search** ..... 361/728-730,  
361/735, 736-737, 748, 749, 760, 763,  
767, 768, 807, 808, 785, 788, 790, 791,  
803; 257/693, 684, 679, 678; 711/301;  
714/773; 365/51-52, 63; 174/250, 253,  
255-256, 260

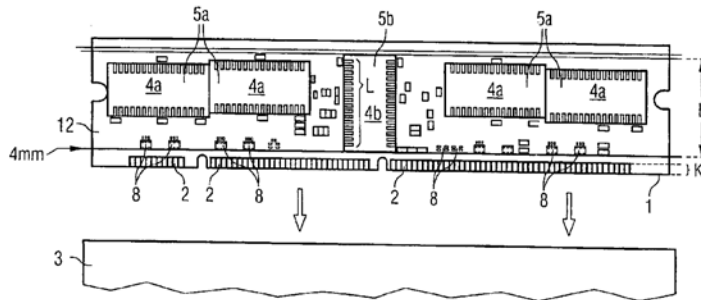
(57) **ABSTRACT**

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U.S. PATENT DOCUMENTS

An electronic printed circuit board has a memory module and a contact strip for insertion into another electronic unit. The memory module has at least nine identically designed housing-encapsulated integrated semiconductor memories configured on the printed circuit board. The longer dimension of the housing of one of the semiconductor memories, which is connected as an error correction chip, is oriented perpendicular to the contact strip. The longer dimension of the housings of the other semiconductor memories are oriented parallel to the contact strip. The different orientation of the semiconductor memories makes it possible to reduce the height of the printed circuit board while enabling the rectangular housings to keep the same physical form.

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**8 Claims, 3 Drawing Sheets**

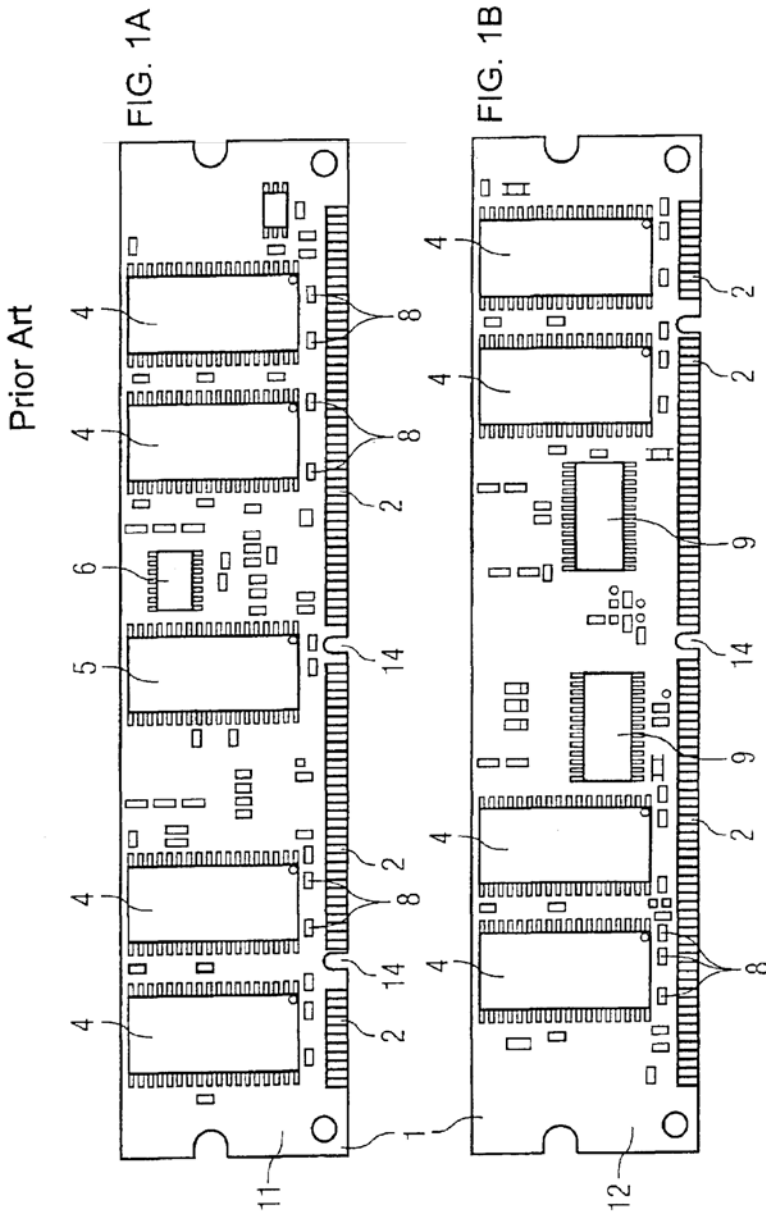


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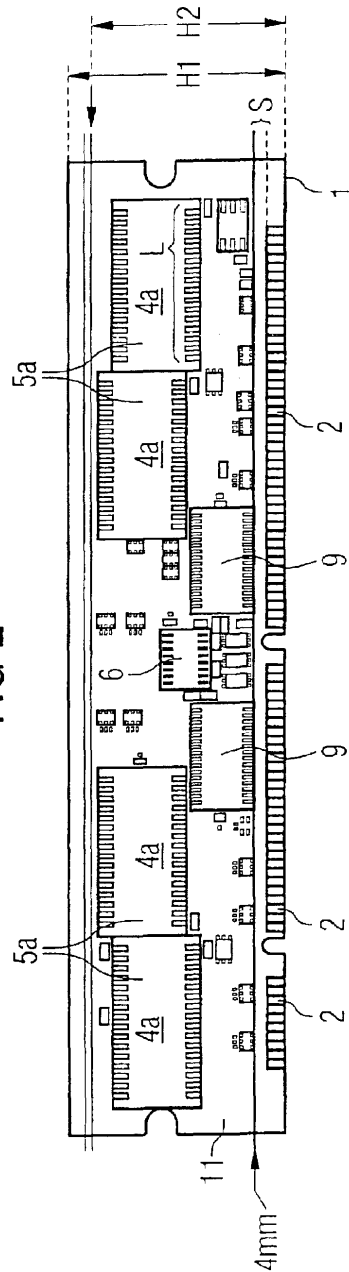
Sheet 1 of 3

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Appx741

FIG 2



Appx742

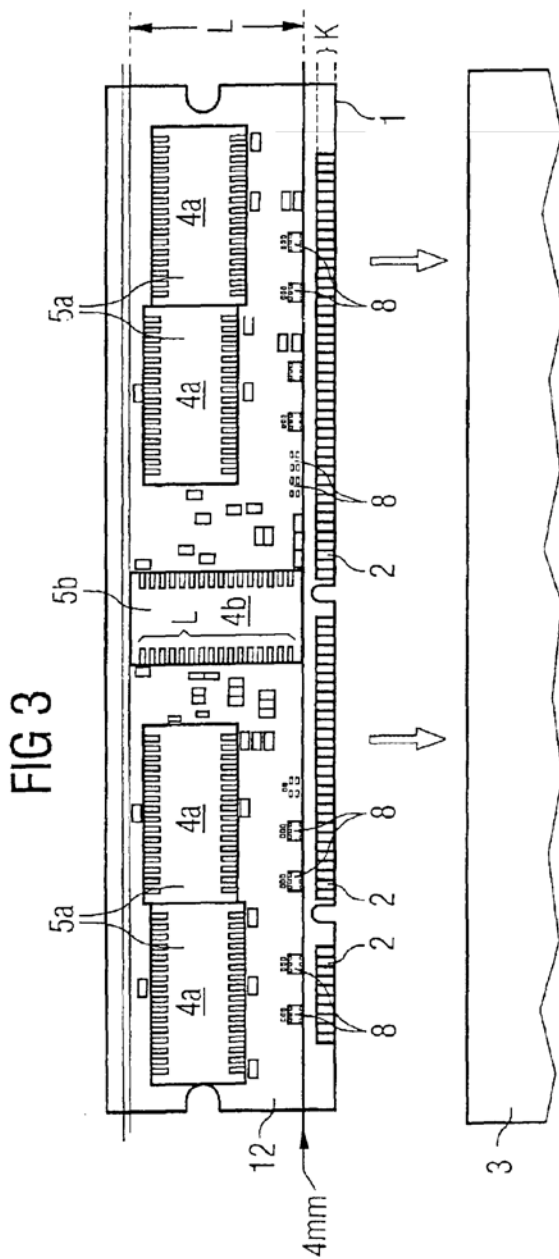


FIG 3

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**ELECTRONIC PRINTED CIRCUIT BOARD  
HAVING A PLURALITY OF IDENTICALLY  
DESIGNED, HOUSING-ENCAPSULATED  
SEMICONDUCTOR MEMORIES**

**BACKGROUND OF THE INVENTION**

**Field of the Invention**

The invention relates to an electronic printed circuit board, which has a memory module and a contact strip that can be inserted into another electronic unit. The memory module has at least nine identically designed integrated semiconductor memories encapsulated in identically designed rectangular housings. The housings are each individually connected to the printed circuit board. One of the semiconductor memories is connected as an error correction chip on the printed circuit board and the rectangular housing of that memory is arranged on the printed circuit board in a manner such that the longer dimension is oriented perpendicular to the contact strip.

Printed circuit boards of this type are inserted into motherboards of personal computers or network computers and serve as the main memory, for example. In network computers, the printed circuit boards are inserted into compartment-type elements having a small height, for which reason the printed circuit boards themselves should also have only a small height (the dimension perpendicular to the contact strip). Therefore, compared with their width, which is essentially determined by the length of the contact strip, insertable printed circuit boards are not very high so that the compartment-type elements can be made very flat.

The height of a printed circuit board essentially depends on the dimensions of the largest components arranged on the printed circuit board. The largest components that are arranged on a printed circuit board are generally housings for semiconductor chips containing integrated circuits. The connections of the semiconductor chips are connected by the housing to corresponding contacts on the printed circuit board that are significantly larger than the chip connections. The housings themselves are also much larger than the integrated circuits and thus concomitantly determine the minimum height of the printed circuit board. In the case of printed circuit boards which carry memory modules, the largest housings are those for semiconductor memories, for example, for SDRAMs (synchronous dynamic random access memories). The housings therefore have a rectangular form and are always arranged on the printed circuit board vertically, i.e. they are oriented with their longer dimension perpendicular to the contact strip.

The reason for this arrangement is that one of the semiconductor memories is used as an error correction chip in order to perform error checking on data that will be stored in the rest of the semiconductor memories or that will be read from the memories. The error correction chip is arranged approximately in the center of the contact strip, is arranged above the contact strip, and is arranged vertically, i.e. with the longer dimension of its housing at right angles to the contact strip, because of prescribed lengths of the conductor tracks which connect the error correction chip to the contact strip.

The rest of the semiconductor memories are arranged on both sides of the error correction chip and also on the front and rear sides of the printed circuit board in the same orientation as the error correction chip, so that all of the identically designed semiconductor memories are lined up along the contact strip in a conventional arrangement. The

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contact strip has electrical contacts on the front side and also on the rear side of the printed circuit board. Equally, the housing-encapsulated semiconductor memories are present both on the front side and on the rear side of the printed circuit board. Only a single error correction chip is provided and is situated, for example, on the front side of the printed circuit board.

In addition to further semiconductor chips that are encapsulated in smaller housings than the memory chips and that are arranged in proximity to the center of the contact strip, the printed circuit board has further, still smaller components, primarily passive components such as resistors and capacitors. In particular, many resistors are arranged in the outer regions of the contact strip. The resistors require a short connection to corresponding contacts of the contact strip.

By contrast, the housing-encapsulated semiconductor memories arranged in the outer regions of the contact strip are arranged at a somewhat larger distance from the contact strip, since their leads to the contact strip are permitted to be longer than the leads of the passive components to the contact strip.

The distance of all of the semiconductor memories from the contact strip is chosen in a uniform fashion, so that the vertically arranged memory housings concomitantly determine a certain minimum height of the printed circuit board. This is composed of the longer dimension of a memory housing, the height of resistors that are arranged between the housings and the contact strip, the height of the contact strip itself, and possibly a safety clearance between the contact strip and the components on the printed circuit board. This safety clearance serves, in the event of a slightly inclined attitude of the printed circuit board during insertion into motherboards, to protect the nearest components on the printed circuit board from mechanical damage, and is chosen to be as small as possible.

In the case of this conventional arrangement, in which the edges of the memory housings lined up along the contact strip are aligned, there is no more leeway for a further reduction of the circuit board height (the height of the printed circuit board perpendicular to the contact strip).

**SUMMARY OF THE INVENTION**

It is accordingly an object of the invention to provide an electronic printed circuit board having a memory module and a contact strip that can be inserted into another electronic unit, in which the printed circuit board overcomes the above-mentioned disadvantages of the prior art apparatus of this general type.

In particular, it is an object of the invention to reduce the height of the printed circuit board still further while using the same memory housings.

With the foregoing and other objects in view there is provided, in accordance with the invention, an electronic printed circuit board configuration including: an electronic printed circuit board having a contact strip for insertion into another electronic unit; and a memory module having at least nine identically designed integrated semiconductor memories. Each one of the semiconductor memories is encapsulated in a rectangular housing having a shorter dimension and a longer dimension. The housing of each one of the semiconductor memories is identically designed and is individually connected to the printed circuit board. One of the semiconductor memories is connected as an error correction chip. The longer dimension of the housing of the error correction chip is oriented perpendicular to the contact

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strip. The longer dimension of the housing of each one of the semiconductor memories, other than the error correction chip, is oriented parallel with the contact strip.

The object of the invention is achieved by virtue of the fact that, in the case of the printed circuit board of the generic type, the housings of the identically designed semiconductor memories, other than the error correction chip, are arranged on the printed circuit board in a manner such that they are oriented with their longer dimension parallel to the contact strip.

The housings of the semiconductor memories, which are identically designed, and therefore, all have the same dimensions, are arranged on the printed circuit board with a different orientation. While the semiconductor memory that is to be connected up as the error correction chip is still arranged vertically in order to comply with the specifications for the conductor track lengths of its leads, the rest of the identically designed semiconductor memories are arranged horizontally, that is to say parallel to the contact strip. In this position, the longer dimension of the rectangular housings extend parallel to the contact strip, and each horizontally oriented semiconductor memory requires a smaller circuit board height than in the case of a vertical orientation. The semiconductor memory that is used as the error correction chip and that concomitantly determines the height of the printed circuit board still requires the same space and thus actually, moreover, the original circuit board height.

However, this semiconductor memory, and this is something that is exploited according to the invention, is the only one that can be brought still closer to the contact strip, since no resistors have to be arranged between it and the contact strip. As a result, the board height is reduced by the distance that is taken up by the resistors that are arranged between the memory housings and the contact strip. Although these resistors are present over the outer regions of the contact strip on the printed circuit board, the semiconductor memories that are arranged horizontally overall lie closer to the contact strip, since they are narrower horizontally. The semiconductor memory used as the error correction chip can be brought up to the contact strip by the distance that is required by the resistors arranged in the outer regions of the contact strip.

This results in a certain, albeit small, narrowing of the printed circuit board. In many cases, however, this suffices to actually enable the incorporation into network computers.

A preferred embodiment provides for the semiconductor memories to be arranged such that the housing of the error correction chip extends, as seen from the contact strip, through to a greater distance from the contact strip than the housings of the other identically designed semiconductor memories. In this case, the horizontally oriented semiconductor memories are brought so close to the resistors at the contact strip that they do not require the printed circuit board to have a larger height than that required by the error correction chip that is brought up to the contact strip. This exploits the maximum space saving that can be obtained by using the invention.

Accordingly, in a preferred embodiment, the printed circuit board has a height that is perpendicular to the contact strip and that is composed of the sum of the longer dimension of a rectangular housing, the length of a contact of the contact strip and a safety clearance between the error correction chip and the contact strip of less than 2 mm. Accordingly, the error correction chip is brought up to the contact strip in a manner that leaves a slight safety clearance. The safety clearance serves for, in the event that the printed

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circuit board is placed in an inclined position during the insertion or withdrawal from a motherboard, for example, avoiding damage to the housing of the error correction chip (or further modules arranged in the same proximity to the contact strip). It goes without saying that the safety clearance can be reduced to the amount that is still just required.

The printed circuit board preferably has a height of 1 to 1.2 inches perpendicular to the contact strip. The height of a printed circuit board is the length of the edge of the printed circuit board—considered from the direction of the printed circuit board area—which extends perpendicularly to the contact strip. By contrast, the length of the edge parallel to which the contact strip runs is called the board width. The board height is generally quite smaller than the board width. The dimension of the printed circuit board perpendicular to its surface is referred to, not as the height of the printed circuit board, but rather as the printed circuit board thickness.

The housings of the identically designed semiconductor memories are preferably TSOP housings (thin small outline packages). These are standardized housings of predetermined dimensions (thin small outline package). Using the present invention, the height of the printed circuit board can be further reduced even when these housings continue to be used.

In a further preferred embodiment, the memory module has nine identically designed semiconductor memories. This embodiment allows high utilization of the printed circuit board area in the case of a symmetrical arrangement when two identically designed semiconductor memories are configured on each side of the error correction chip on both the front side and also on the rear side of the printed circuit board.

In a preferred embodiment, the printed circuit board is configured according to the standard of the PC 133 SDRAM registered DIMM design specification, raw card A or raw card F. This standard relates to the type of interconnection of the individual components of the memory module and the individual contacts of the contact strip. This standard defines length specifications of about 800 conductor tracks that are laid on the printed circuit board, except for permissible length tolerances. This standard furthermore contains specifications concerning the thickness of conductor tracks, concerning the approximate course of conductor tracks and also the time windows for the temporal sequence of signal transmissions. The raw cards A and F, special standard groups within the PC 133 SDRAM registered DIMM design specification, are defined for printed circuit boards that already have a very small height anyway. Using the present invention, even printed circuit boards that are configured according to these standard groups can be narrowed further.

Finally, the printed circuit board has a width of 5.25 inches. This board width has gained acceptance in the case of memory module boards.

Other features which are considered as characteristic for the invention are set forth in the appended claims.

Although the invention is illustrated and described herein as embodied in an electronic printed circuit board having a plurality of identically designed, housing-encapsulated semiconductor memories, it is nevertheless not intended to be limited to the details shown, since various modifications and structural changes may be made therein without departing from the spirit of the invention and within the scope and range of equivalents of the claims.

The construction and method of operation of the invention, however, together with additional objects and

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advantages thereof will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A shows the front side of a conventional printed circuit board;

FIG. 1B shows the rear side of the conventional printed circuit board;

FIG. 2 shows the front side of an inventive printed circuit board; and

FIG. 3 shows the rear side of the printed circuit board shown in FIG. 2.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the figures of the drawing in detail and first, particularly, to FIG. 1A thereof, there is shown a plan view of the front side 11 of a conventional printed circuit board 1 having, at its lower edge, a contact strip 2 interrupted by two indentations 14. If the printed circuit board is rotated about a vertical axis extending through the right-hand indentation 14, then the rear side 12 of the printed circuit board becomes visible. The rear side is illustrated in FIG. 1B. The front side 11 and the rear side 12 overlap in a mirror-inverted fashion, so that the left-hand half of the front side 11 corresponds to the right-hand half of the rear side 12.

The printed circuit board 1 has a number of memory chips 4 on both printed circuit board areas 11, 12 and also has a further identically designed chip, which is used as an error correction chip 5. Furthermore, further semiconductor modules are present, for example two register chips 9, with which memory addresses in the memory chips 4 are amplified synchronously, and a clock synchronization chip 6—also called PLL (phase locked loop)—for matching the memory module to an external clock frequency. Each of these semiconductor modules is encapsulated in a housing that connects the connections of the semiconductor module to significantly larger contacts of the printed circuit board. The dimensions of the housings are standardized, in which case, of all the semiconductor modules 4, 5, 6 arranged on the printed circuit board, the memory modules 4, 5 have the largest housings. For this reason, the size of their housings is determinative of the required height of the printed circuit board. In FIG. 1, the housings for the respective semiconductor modules 4, 5, 6 are designated by the reference symbols of the semiconductor modules themselves, since the housings determine their space requirement on the printed circuit board.

On the conventional printed circuit board 1 illustrated in FIG. 1, all of the semiconductor memories 4 are arranged on the printed circuit board vertically, i.e. such that the longer dimension of their rectangular housings is oriented perpendicular to the extent of the contact strip 2. The semiconductor memories are thus lined up parallel to one another on the front side and the rear side of the printed circuit board along the extent of the contact strip 2. In this arrangement, the smaller edges of the housings of the semiconductor memories 4 and 5 are aligned, i.e. all the memory modules 4, 5 are arranged in a line. They are all situated at the same distance from the contact strip 2. This distance is predetermined by the width of the resistors 8 that are arranged in between the contact strip 2 and the memory modules 4, 5 and by the mechanically dictated or thermally dictated safety clearances on both sides of the resistors 8. In each case, two of

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these resistors 8 must be arranged between one semiconductor memory 4 and the contact strip 2, because the upper limit for the length of the leads of the resistors from the contact strip 2 permits no other arrangement.

The contact strip 2, the resistors 8, the larger dimension of the housings of the semiconductor memories 4, 5 and also certain safety clearances between these together produce the required board height of this conventionally configured printed circuit board.

FIG. 2 shows the front side 11 of an inventive printed circuit board. FIG. 3 shows the rear side 12 of the printed circuit board and diagrammatically shows, an electronic unit 3, for example a motherboard, into which the contact strip 2 of the printed circuit board 1 can be inserted.

FIGS. 2 and 3 show the front side 11 and the rear side 12 of a printed circuit board 1 configured according to the invention. The identically designed semiconductor memories are designated by 4a, 4b and their likewise identically designed housings are designated by 5a, 5b.

On the printed circuit board that is populated according to the invention, as shown by FIGS. 2 and 3, the housings 5a of those semiconductor memories 4a which are not connected up as the error correction chip are arranged horizontally on the printed circuit board 1, i.e. the respective longer dimension L of the rectangular housings 5a runs parallel to the extent of the contact strip 2. Only the housing 5b of the error correction chip 4b is arranged vertically and takes up the same printed circuit board height as on a conventional printed circuit board. However, the housing of the error correction chip is brought up to the contact strip 2 as close as possible. This is possible because, between the error correction chip or its housing 5b and the contact strip 2, there is no need to arrange any passive components. In particular, there is no need for any resistors 8, as in the case of all of the other identically designed semiconductor memories 4a that are configured horizontally. By contrast, these semiconductor memories 4a take up for themselves a significantly smaller printed circuit board height than when in the vertical orientation, so that the actual printed circuit board height is determined only by the error correction chip 4b that is brought up to the contact strip 2.

As a result, the height of the printed circuit board can be reduced from a value  $H_1$  to a smaller value  $H_2$  composed of the longer dimension L of the identically-designed housings 5b, the length K of the contacts of the contact strip 2 (in the direction of the double arrow to L), and a safety clearance S between the contacts of the contact strip and the resistors 8. This reduction of the printed circuit board height enables incorporation into even flatter elements of e.g. network computers.

The printed circuit board illustrated in FIGS. 2 and 3 is populated in such a way that it can be connected up in accordance with the raw card A or raw card F of the standard "PC 133 SDRAM registered DIMM design specification" (133 MHz; dual inline memory module). It has a height of between 1 and 1.2 inches between the lower edge, at which the contact strip 2 is situated, and the upper edge.

The remainder of the components illustrated and their functions correspond to the prior art. The memory modules 4a, 4b are SDRAMs (synchronous dynamic random access memory modules). They are encapsulated in TSOP housings (thin small outline package) 5a, 5b.

The clock synchronization chip 6 (PLL; phase locked loop) ensures that, after a few clock cycles of the clock signal that is output from the electronic unit 3 via the contact strip 2 to the memory modules of the printed circuit board 1, the latter can operate synchronously with the motherboard.

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Data that is transported to the semiconductor memory modules 4a always contain check data. The error correction chip, namely memory module, 4b checks the correctness of the data before the data are passed on.

A wide variety of methods are known according to which the error correction chip, namely memory module, 4b can operate. An example that shall be mentioned here is the ECC method (error correcting code), in which a check bit is added to eight bits of data to be communicated.

FIG. 2 furthermore shows two register chips 9, with which the memory addresses in the memory chips 4 are amplified synchronously.

All of the components situated on the printed circuit board are connected to one another and to the contact strip by conductor tracks. At the present time, printed circuit boards usually have six different conductor track planes lying one above the other in which the conductor tracks are arranged. The course of the conductor tracks is configured according to a suitable raw card of the above standard. The conductor tracks are not illustrated in the figures since their specific course is not essential with regard to the present invention.

We claim:

- 1. An electronic printed circuit board configuration, comprising:
  - an electronic printed circuit board having a contact strip for insertion into another electronic unit; and
  - a memory module having at least nine identically designed integrated semiconductor memories;
  - each one of said semiconductor memories being encapsulated in a rectangular housing having a shorter dimension and a longer dimension;
  - said housing of each one of said semiconductor memories being identically designed and being individually connected to said printed circuit board;
  - one of said semiconductor memories being connected as an error correction chip;
  - said longer dimension of said housing of said error correction chip being oriented perpendicular to said contact strip; and

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said longer dimension of said housing of each one of said semiconductor memories, other than said error correction chip, being oriented parallel with said contact strip.

- 2. The printed circuit board according to claim 1, wherein:
  - said housing of said error correction chip extends a greater distance away from said contact strip than said housing of each one of said semiconductor memories, other than said error correction chip.
- 3. The printed circuit board according to claim 1, wherein:
  - said contact strip has a contact with a length;
  - said printed circuit board has a height extending perpendicular to said contact strip; and
  - said height of said printed circuit board is equal to a sum of said longer dimension of said housing of said error correction chip, said length of said contact of said contact strip and a safety clearance between said error correction chip and said contact strip of less than 2 mm.
- 4. The printed circuit board according to claim 1, wherein:
  - said printed circuit board has a height of 1 to 1.2 inches perpendicular to said contact strip.
- 5. The printed circuit board according to claim 1, wherein:
  - said housing of each one of said semiconductor memories is a TSOP housing.
- 6. The printed circuit board according to claim 1, wherein:
  - said at least nine semiconductor memories define exactly nine semiconductor memories.
- 7. The printed circuit board according to claim 1, wherein:
  - said printed circuit board is configured according to a specification selected from a group consisting of a raw card A of a PC 133 SDRAM registered DIMM design specification and a raw card F of the PC 133 SDRAM registered DIMM design specification.
- 8. The printed circuit board according to claim 1, wherein:
  - said printed circuit board has a width of 5.25 inches.

\* \* \* \* \*

# UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

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