

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WESTERN DIGITAL TECHNOLOGIES, INC.,
Petitioner,

v.

GODO KAISHA IP BRIDGE 1,
Patent Owner.

Case No. IPR2025-00701
U.S. Patent No. 10,367,138

**PATENT OWNER'S REQUEST TO THE DIRECTOR FOR
DISCRETIONARY DENIAL OF INSTITUTION**

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2004	U.S. Patent Application Publication No. 2007/0195592 A1
2005	File History of U.S. Patent No. 8,514,527
2006	File History of U.S. Patent No. 7,851,785
2007	European Patent Application Publication No. EP 1 737 055 A1
2008	Petition for <i>Inter Partes</i> Review of U.S. Patent No. 9,608,198, Case No. IPR2024-01386, Paper No. 1
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2056	U.S. Patent No. 8,514,527
2057	U.S. Patent No. 7,851,785

I. INTRODUCTION

The '138 Patent at issue in this proceeding is one of nine patents that Patent Owner asserted against Petitioner in a related district court litigation. The nine asserted patents are all from the same family of straight continuations. Petitioner filed IPRs against the other eight patents many months ago. As a result, the Board has already issued institution decisions in those other eight related IPRs. The Board denied five of Petitioner's IPRs, four on the merits, and instituted trials in three. The three instituted IPRs are the subject of pending requests for Director review seeking discretionary denial.

The '138 Patent's family has been in force since early 2011. The inventor's groundbreaking work described in this patent family was the subject of numerous awards and contemporaneous praise. It has been cited thousands of times by others in the field, including Petitioner's employees. The inventor's groundbreaking work was well-known to everyone in the field. The facts here favor discretionary denial even more than in the Director's recent *Irhythm Technologies* decision discussed *infra* § III.A. Petitioner has been aware of the inventor's work since at least 2006 and has been aware of the pending patent family since at least 2010. Instead of seeking early review, Petitioner waited more than 13 years. Thus, as in *Irhythm Technologies*, Petitioner's awareness of Patent Owner's applications and failure to seek early review favors denial of institution.

In *Irhythm Technologies*, the Director found that settled expectations warranted discretionary denial despite other factors weighing against discretionary denial. The opposite is true here –there are numerous additional considerations that also weigh strongly in favor of discretionary denial.

First, Petitioner engaged in gamesmanship by staggering the filing of this IPR relative to the other eight IPRs challenging the patent family. Petitioner filed its IPRs against the other eight patents many months ago. Petitioner could have filed this IPR in the same timeframe as the other eight because the claimed subject matter overlaps and the Petition relies only on prior art that was used in Petitioner's other IPRs filed at least five months earlier. Instead, Petitioner staggered the filing of this IPR in an attempt to gain a strategic advantage in the related district court action and before the Board. Petitioner agreed to stay the district court case while IPRs were pending because it would have been inefficient to have duplicative proceedings addressing the patentability of the challenged patents progress in parallel. By delaying the filing of this IPR by five months, Petitioner sought to extend the length of that stay. Additionally, by staggering the timing of this IPR, Petitioner sought to benefit from seeing Patent Owner's substantive arguments in Petitioner's earlier-filed IPRs. And Petitioner was not shy about taking full advantage. This Petition changes arguments in Petitioner's earlier-filed petitions to address deficiencies Patent Owner identified, including

deficiencies the Board ultimately relied upon in denying institution of some of Petitioner's earlier-filed IPRs. *See infra* § III.B. As *General Plastic* explains, staggering the filing of petitions and using a patent owner's arguments as a roadmap in a subsequently-filed petition is an inefficient use of the Board's resources and unfair to the patent owner. The same inefficiency and unfairness concerns are implicated here. The Director should not reward Petitioner's gamesmanship and should exercise her discretion to deny this Petition.

Second, the '138 Patent claims share many limitations with the other patents in the family that were the subject of Petitioner's failed IPRs that relied on the same prior art used in this Petition. *See infra* § III.B. Thus, if the Board were to conduct a trial in this IPR to determine whether Petitioner's prior art renders the '138 Patent claims unpatentable, that would not be a "true alternative" to district court litigation because the district court is going to need to address many of the ***same claim limitations***, the ***same prior art***, and the ***same secondary consideration evidence*** in addressing the validity of other patents in the family that were the subject of Petitioner's failed IPRs. *See e.g., Motorola Solutions v. Stellar*, IPR2024-01205, Paper 19 at 3-4 (PTAB Mar. 28, 2025) (the Director vacated institution and denied an IPR, in part, because the trial would not have been a true alternative to a district court litigation). That is another independent reason why the Director should exercise her discretion to deny institution here.

Third, the Director should deny institution under 35 U.S.C. § 325(d) and *Advanced Bionics*. *Advanced Bionics* step 1 is satisfied because Petitioner challenges the independent claims with grounds that rely exclusively on prior art “previously presented to the Office” during original prosecution. Petitioner cannot show material error by the Office as required by *Advanced Bionics* step 2. The invention claimed in the ’138 Patent was a major advance in the art as evidenced by the inventor receiving numerous awards and substantial contemporaneous praise. *See infra* § III.C.2. Despite that, Petitioner argues that the claims would have been obvious over references that were known to those in the field and of record during prosecution. The contemporaneous reaction of those in the field – who widely applauded the groundbreaking nature of the invention – puts the lie to Petitioner’s assertion that the claims were obvious. Petitioner cannot demonstrate that the examiner committed material error where the examiner’s judgment about the merits of the claimed invention mirrored the contemporaneous reaction of those skilled in the art at the time. Institution should also be discretionarily denied under § 325(d).

Fourth, for claims that the Petition itself characterizes as “critical,” the Petition relies exclusively on expert testimony – unsupported by any patent or printed publication – to purportedly support an argument that is critical to Petition’s obviousness arguments. The technology at issue in this case (quantum

physics) is extremely complicated. The quantum phenomenon (called “tunneling”) at issue in this case was not well-understood at the time of the invention.

Petitioner’s own prior art references make this clear. The authors were explicit that they could only speculate as to why certain results were seen, and in one case the Petitioner’s relied-upon reference even reported results that the *author admitted* in a later publication *were wrong*. The uncertainty in this complex field is reinforced by the contemporaneous praise the inventor received when he was able to achieve results that far exceeded expectations.

As the Director’s March 26, 2025 memorandum regarding Interim Processes for PTAB Workload Management (“Interim Processes Memo”) makes clear, “[t]he extent of the petition’s reliance on expert testimony” is a factor that will be considered in determining whether to discretionarily deny a petition. If an IPR trial were held, the testimony of Petitioner’s expert would be hotly disputed because it is simply wrong in critical respects. Petitioner’s expert testimony will be refuted by Patent Owner’s expert and patents and printed publications that refute the naked say-so of Petitioner’s expert. The Board’s recent guidance notes that “extensive reliance on expert testimony and/or reasonable disputes between experts on dispositive issues may suggest that the questions are better resolved in

an Article III court.”¹ The disputed issues here would undeniably be better resolved before the district court, all the more so because irrespective of the outcome in this IPR, the district court is going to need to resolve most of the same issues in addressing patents from the same family that were the subject of Petitioner’s failed IPR petitions. The Board should not devote its limited resources to having a trial to evaluate grounds that hinge entirely on expert testimony, particularly where doing so would be duplicative of the same evaluation that will need to take place in the district court action.

As detailed below, for each of these reasons Patent Owner asks the Director to exercise her discretion to deny institution.

II. BACKGROUND

Patent Owner asserted nine patents against Petitioner in a related litigation currently pending in the U.S. District Court for the Northern District of California. *Godo Kaisha IP Bridge 1 v. Western Digital Technologies*, Case No. 24-cv-06555-RS (N.D. Cal.). These nine asserted patents share a specification and belong to the same family of straight continuations.

¹ FAQ 21, available at <https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management> (visited June 13, 2025).

A. The Patented Invention

Each of the asserted patents in the related litigation, including the patent at issue in this IPR, is directed to a ground-breaking advance to a special kind of solid-state electronics device known as a “magnetic tunnel junction” (“MTJ”) device. MTJ devices have two magnetic electrodes separated by an insulating layer. It is well-known that current does not typically flow through an insulator. But under certain conditions, current can flow between the electrodes of an MTJ device because electrons can pass through its insulating layer via a quantum mechanical phenomenon known as “tunneling.”

While a scientist at Japan’s premier National Institute of Advanced Industrial Science and Technology, the sole inventor, Dr. Shinji Yuasa, developed the claimed MTJ device which far out-performed previous MTJ devices. Dr. Yuasa is widely recognized as a luminary in the MTJ device field because of his contributions described in the ’138 Patent. His family of related patents cover innovations that have dramatically improved the density of information that can be accurately written to, and read from, a hard disk drive using MTJ devices. The hard drive market has grown to more than \$60 billion annually, widely relying on MJT devices using Dr. Yuasa’s innovations. EX2001; EX1063, ¶¶ 21-26 (evidence of Petitioner itself praising Dr. Yuasa’s innovations), 33-34 (Petitioner’s products accused of infringement). Dr. Yuasa’s foundational papers on the work

described in the '138 Patent have been cited over **5,000 times**, evidencing the groundbreaking nature of his discoveries. EX2002, EX2003. For his pioneering contribution to MTJs, Dr. Yuasa has been awarded or co-awarded many ***prestigious scientific awards or prizes that are detailed below.***

B. Petitioner's IPRs

Over the course of a month from August 30, 2024 to September 27, 2024, Petitioner filed IPRs challenging eight of the nine patents asserted in the litigation complaint. About a week before the first institution decisions were due, and months after Patent Owner filed its preliminary responses in all eight of the other IPRs, Petitioner filed this ninth IPR (IPR2025-00701) on March 6, 2025. This ninth IPR uses the exact same prior art cited in Petitioner's first-filed IPRs (IPR2024-01384, -01385 and -01386) that were filed over six months earlier. While it uses the same prior art, this ninth IPR Petitioner modifies some of the arguments in the earlier-filed IPRs in an attempt to buttress weaknesses in Petitioner's grounds that were identified by Patent Owner's preliminary responses in those earlier-filed IPRs. *See infra* § III.B.2.

The Board denied institution of the five first-filed IPRs. The Board then granted institution of the three next-filed IPRs. Patent Owner has filed Petitions for Director Review requesting that each of those instituted IPRs be terminated. The IPRs on Patent Owner's family of patents are summarized in the table below:

Table 1
Summary of Related IPRs

IPR No.	Challenged Patent No.	Date IPR Filed	Date POPR Filed	Institution Decision
IPR2024-01384	7,884,403	Aug. 30, 2024	Dec. 18, 2024	Denied on merits March 13, 2025
IPR2024-01385	8,319,263	Aug. 30, 2024	Dec. 18, 2024	Denied on merits March 13, 2025
IPR2024-01386	9,608,198	Aug. 30, 2024	Dec. 18, 2024	Denied on merits March 13, 2025
IPR2024-01449	9,123,463	Sept. 16, 2024	Dec. 18, 2024	Denied on merits March 14, 2025
IPR2024-01448	11,737,372	Sept. 16, 2024	Jan. 23, 2025	Denied in light of disclaimer March 26, 2025
IPR2024-01447	8,405,134	Sept. 16, 2024	Jan. 23, 2025	Instituted on April 21, 2025,
IPR2024-01493	10,680,167	Sept. 27, 2024	Feb. 4, 2025	Instituted on April 30, 2025
IPR2024-01494	11,968,909	Sept. 27, 2024	Feb. 11, 2025	Instituted on April 30, 2025
IPR2025-00701	10,367,138	March 6, 2025	~July 2025	Due ~Oct. 2025

III. DISCRETIONARY DENIAL IS WARRANTED

The Board should not devote its limited resources to considering the merits of this Petition. Discretionary denial is warranted for at least five independent reasons as detailed below.

A. Petitioner’s Awareness of the Patent Family and Failure to Seek Early Review Warrants Discretionary Denial

The Director recently discretionarily denied five IPR petitions challenging a family of five patents because “Petitioner’s awareness of Patent Owner’s [pending] applications [for the family] and failure to seek early review of the patents favors

[discretionary] denial.” *See Irhythm Technologies v. Welch Allyn*, IPR2025-00363, Paper 10 at 3 (Director’s Decision) (June 6, 2025). Discretionary denial is warranted here for the same reason.

The ’138 Patent is a member of a family of patents, all asserted against Petitioner in the related litigation, that issued from a series of straight continuations. *See supra* § II. The first patent in the family to issue – the ’403 Patent – has been in force since February 8, 2011. *See* EX1001 (the ’403 Patent).

Everybody in the field, ***including Petitioner***, knew of Dr. Yuasa’s work. According to Google Scholar, Dr. Yuasa’s key papers in this space have been cited more than 5,000 times. EX2002; EX2003. Petitioner was aware of Dr. Yuasa’s work described in the ’138 Patent since at least 2006. For example, in a 2006 paper, Petitioner hailed Dr. Yuasa’s work as spawning a “surge in research” that “continues to this day.” EX2021, 38; EX1063 (Complaint), ¶22. In that same paper, Petitioner recognized that “[t]he development of CoFeB/MgO/CoFeB tunnel junctions² [described in Dr. Yuasa’s work] provides a practical solution” to difficulties the industry was having with MTJ devices. *Id.*, 39. In another paper, Petitioner praised the “significance of” Dr. Yuasa’s work and commented that Dr. Yuasa’s “result motivated many researchers in industry and academia to further pursue the potential of MgO-based” MTJ devices. EX2022, 107. Additional

² This is required by every claim of the ’138 Patent.

citations by Petitioner to Dr. Yuasa's work in journal publications and in Petitioner's own patent applications are detailed in paragraphs 23-28 of the Amended Complaint (EX1067) and in § III.C.2.a below.

After having extensively cited-to and praised Dr. Yuasa's well-known work, and after having leveraged Dr. Yuasa's inventions in building its multi-billion dollar hard disk drive business (see EX2042, 38), Petitioner cannot credibly allege that it did not know that Dr. Yuasa had filed patent applications to protect his award-winning inventions.

There is also direct evidence, similar to the evidence the Director cited in *Irhythm*, of Petitioner's awareness of the challenged patent family. In ***November of 2010***, Hitachi Global Storage ("Hitachi-GS") cited the published application (US 2007/0195592 A1, EX2004) that ultimately issued as the '403 Patent in an Information Disclosure Statement in Hitachi-GS's pending application (EX2005, (Application No. 12/955,767) that later issued as U.S. Patent No. 8,514,527 which is now owned by Petitioner ("Petitioner's '527 Patent", EX2056 (identifying Application No. 12/955,767 on its face). *See* EX2005, 4, 90 (file history of Petitioner's '527 Patent showing citation to US 2007/0195592 A1 that ultimately issued as the '403 Patent); EX1001 (the '403 Patent on its face identifies US 2007/0195592 A1 as its published application); EX2054, 1, 85 (USPTO assignment records reflect that Petitioner Western Digital has owned the '527

Patent since at least 2016); *Irhythm Technologies*, IPR2025-000363, Paper 10 at 3 (pointing to citation of a then-pending application on an IDS filed in Petitioner’s own patent application as evidence of “Petitioner’s awareness of Patent Owner’s applications”).

The direct evidence of Hitachi-GS’s awareness of the patent family during prosecution of Petitioner’s ’527 Patent establishes awareness by Petitioner Western Digital. Western Digital acquired Hitachi-GS, which became a wholly-owned subsidiary of Western Digital, in 2012 before Petitioner’s ’527 Patent even issued. EX2055 (discussing Western Digital’s acquisition of Hitachi-GS in 2012 and its operation as a wholly owned subsidiary); EX2056 (’527 Patent identifying its issue date of Aug. 20, 2013). Indeed, Petitioner took direct ownership of the ’527 Patent that cites the ’138 Patent family in 2016 – almost a decade before Petitioner challenged the ’138 Patent family. Any suggestion from Petitioner that Hitachi-GS operated independently of Petitioner Western Digital is belied by the fact that Western Digital took for itself direct ownership of Hitachi-GS’s patents, including the ’527 Patent, in 2016. EX2054, 1, 85.

There is also another similar example. During prosecution of another patent – U.S. Patent No. 7,851,785 (“Petitioner’s ’785 Patent”, EX2057)— that was filed by Hitachi-GS but owned by Petitioner since 2016, the examiner cited EP1737055A1, a European counterpart of the ’403 Patent, in a final rejection dated

Jan. 6, **2010**. See EX2006, 98 (prosecution history of Hitachi-GS/Petitioner’s patent application 11/350,226 citing EP1737055A1); EX2057 (’785 Patent identifying patent application no. 11/350,226 on its face); EX2007, 1 (EP1737055A1 entered the national stage in Europe from PCT/JP2005/004720); EX1001 (the ’403 Patent entered the national stage in the United States from the same PCT/JP2005/004720); EX2054, 1, 56 (Petitioner Western Digital took direct ownership of the ’785 patent in 2016).

In *Irhythm Technologies*, the Director found “persuasive” the Patent Owner’s argument that discretionary denial was warranted “because one of the patents has been in force since as early as 2012 and Petitioner was aware of it as early as 2013—having cited the then-pending application that issued as the challenged patent in an Information Disclosure Statement Petitioner filed in its own patent application.” *Irhythm Technologies*, IPR2025-000363, Paper 10, 3. The Director found this to “outweigh[]” other considerations that the Director found to “weigh against discretionary denial” including that a final written decision was likely to issue before a district court trial. *Id.*, 2-3.

The facts here establishing that “**Petitioner’s awareness** of Patent Owner’s applications ***and failure to seek early review*** of the patents favors denial” weigh

even more strongly in favor of discretionary denial than in *Irhythm Technologies*.³ *Irhythm Technologies*, IPR2025-000363, Paper 10, 3. Here, the patent family (in force since 2011) was in force even longer (more than 13.5 years) before the filing of an IPR challenging a patent in the family than in *Irhythm Technologies*. *Id.* (noting that the earliest patent in the family had been in force since 2012).

Petitioner has been aware of Dr. Yuasa's well-known work that has been cited more than 5,000 times (EX2002; EX2003) by those in the field since at least 2006 (EX2021, 38; EX1063 (Complaint), ¶22) and had been aware of the patent family (since 2010) for longer (almost 14 years) than the petitioner in *Irhythm Technologies* before filing an IPR. *Irhythm Technologies*, IPR2025-000363, Paper 10, 3 (noting the petitioner's awareness of the family's pending applications since in 2013). Thus, for the same reasons as in *Irhythm Technologies*, "Petitioner's

³ Given the Director's emphasis on the Petitioner's conduct in *Irhythm Technologies*, any suggestion from Petitioner that the result should be different here because Patent Owner acquired this patent family in 2021 would fail.

awareness of Patent Owner’s applications and failure to seek early review of the patents favors denial.”⁴ *Id.*

B. Petitioner’s Gamesmanship in Staggering this Petition Rather than Filing it With the Other Eight Warrants Discretionary Denial

1. Petitioner Staggered the Filing of this Petition in an Attempt to Gain a Strategic Advantage

Patent Owner asserted the nine patents identified in the Table in § II.B against Petitioner. *See* EX1063, EX1067. Petitioner filed eight IPR Petitions between August 30, 2024 and September 27, 2024 challenging eight of the asserted patents.

More than five months after the last of the eight Petitions was filed, and months after POPRs were filed in all eight of those IPRs, Petitioner filed this Petition relying on the same prior art that Petitioner had used in the other eight Petitions. The Petition’s grounds rely on Bowen (EX1026), Soukup (EX1028), Parkin (EX1062) and Wang (EX1055). Petition, 6. Every one of those references was used in the first three petitions filed more than six months before this Petition.

⁴ Termination of the three IPRs instituted on other members of the same patent family is warranted for the same reasons. *See* IPR2024-01447 (challenging Patent No. 8,405,134 (EX1005)); IPR2024-01493 (challenging Patent No. 10,680,167 (EX1013)); IPR2024-01494 (challenging Patent No. 11,968,909 (EX1017)).

See e.g. EX2011 (IPR2024-01384 Petition) at 26, 28, 32, 35, 38, 42; EX2013 (IPR2024-01385 Petition) at 26, 28, 32, 36, 38, 50; EX2008 (IPR2024-01386 Petition) at 26, 28, 34-35, 38, 52.

Given that it relies exclusively on the same prior art, Petitioner could have filed this Petition with the others. Petitioner deliberately chose to wait five months and stagger the filing of this Petition. The Petition offered no justification for doing so. By staggering the filing of this Petition Petitioner sought to achieve two benefits.

First, on October 10, 2024, Patent Owner agreed to a stay in the district court litigation while IPRs challenging the asserted patents were pending. EX1085. By waiting five months to file this Petition after filing the last of the other eight, Petitioner sought to extend the length of that stay by dragging out the pendency of its IPRs. That imposes inefficiencies on the Board. If Petitioner had filed all its IPRs around the same time, the Board could have staffed and resolved the nine related IPRs around the same time. Instead, Petitioner asks the Board to address the merits of this IPR five months after the Board reached its institution decisions on the others, to benefit Petitioner by allowing Petitioner to achieve a strategic advantage. The Director should not reward that gamesmanship.

Second, by staggering the timing of this IPR relative to the others, Petitioner granted itself the benefit of seeing Patent Owner's substantive arguments in

Petitioner's earlier-filed IPRs. Petitioner then used Patent Owner's arguments as a roadmap in an attempt to strengthen its grounds. The Board's precedent makes clear that staggering petitions filed against the same patent is an inefficient use of the Board's limited resources and unfair to the patent owner. *See General Plastic v. Canon* ("General Plastic"), IPR2016-01357, Paper 19 at 16-18 and 21 (PTAB Sept. 6, 2021) (precedential as to § II.B.4.i). Specifically, *General Plastic* factor 3 is directed to:

Petitioner's potential benefit from receiving and having the opportunity to *study Patent Owner's Preliminary Response*, as well as our institution decisions on the first-filed petitions, prior to its filing of follow-on petitions. [W]e are concerned here by the shifts in the prior art asserted and the related arguments in follow-on petitions. See Dec. 11. Multiple, staggered petitions challenging the same patent and same claims raise the *potential for abuse*. The absence of any restrictions on follow-on petitions would allow petitioners the opportunity to *strategically stage* their prior art and arguments in *multiple petitions, using our decisions as a roadmap*, until a ground is found that results in the grant of review. *All other factors aside, this is unfair to patent owners and is an inefficient use of the inter partes review process* and other post-grant review processes."

Id.

The same inefficiency and unfairness concerns are implicated here.

Petitioner staggered its petitions challenging a family of patents using the same

prior art and many of the same arguments. And as explained *infra* § III.B.2, Petitioner went further and studied Patent Owner’s preliminary responses in the earlier-filed IPRs and sought to use Patent Owner’s arguments as a roadmap in modifying Petitioner’s arguments in an attempt to strengthen its grounds. Petitioner’s gamesmanship should not be rewarded. The Director should exercise her discretion to deny this Petition by extending *General Plastic* to this scenario where Petitioner challenged a family of patents that issued from straight continuations using the same prior art but in serially-filed petitions staggered to gain a tactical advantage.

2. Petitioner Used Patent Owner’s Substantive Arguments in the Earlier-Filed IPRs as a Roadmap in an Attempt to Strengthen its Grounds

By waiting to file this Petition until at least five months after the others, Petitioner granted itself the “opportunity to *study Patent Owner’s Preliminary Response[s]*” and modified its grounds here in an attempt to overcome deficiencies that Patent Owner identified in the similar grounds in its earlier-filed petitions. *General Plastic*, IPR2016-01357, Paper 19 at 21; *see also id.*, at 11, 17. Below, Patent Owner provides two examples of Petitioner using Patent Owner’s arguments in the earlier-filed IPRs as a roadmap in modifying the grounds in this Petition.

**a. Petitioner Changed a Secondary Reference After
Patent Owner Identified a Fatal Defect In One of
Petitioner’s First-Filed IPRs**

Every claim in Patent No. 9,608,198 – challenged in one of Petitioner’s first-filed IPRs (IPR2024-01386) – recites a tunnel barrier layer disposed between first and second layers of ferromagnetic material⁵ and requires that the first ferromagnetic material layer is *crystalline and* composed of an alloy comprising iron (Fe), cobalt (Co) and *boron (B)*.⁶ See e.g., EX1009 claim 1. Petitioner’s petition in IPR2024-01386 alleged that claim 1 of the ’198 Patent was obvious over a combination of Bowen and Sunai and relied on Sunai to allegedly teach the claimed *crystalline* CoFeB ferromagnetic layer. EX2008 at 33. In its POPR, Patent Owner explained that because Sunai taught that the inclusion of boron in a CoFeB ferromagnetic layer *inhibited crystallization*, Petitioner failed to show that its Bowen-Sunai combination had a *crystalline* CoFeB ferromagnetic layer as claimed. EX2009 (IPR2024-01386 POPR) at 20-36. The Board ultimately agreed

⁵ In an MTJ device the layers of ferromagnetic material form the electrodes. See *supra* § II.A.

⁶ The claims say the alloy is “of BBC” which the ’198 Patent specification makes clear is short for Body-Centered Cubic which was a known type of crystalline structure. EX1009, 4:44-47.

and denied institution in IPR2024-01386 on that basis. EX2010 (IPR2024-01386 Decision) at 12-14.

Like the claims in the '198 Patent challenged in IPR2024-01386, every claim in the '138 Patent at issue in this IPR requires a ferromagnetic material layer that is *crystalline* and comprises iron (Fe), cobalt (Co) and *boron (B)*. *See* independent claims 1, 7 and 12. As in IPR2024-01386, Petitioner relies on an obviousness ground with Bowen as the primary reference and alleges that a secondary reference would have motivated a POSA to replace Bowen's ferromagnetic layer with a crystalline ferromagnetic layer of FeCoB. *Compare* Petition at 47 (Ground 3)⁷ *with* EX2008 (IPR2024-01386 Petition) at 33. But after having seen Patent Owner's arguments in IPR2024-01386 demonstrating the ultimately fatal flaw in Petitioner's failed argument that Sunai would have motivated a POSA to modify Bowen to yield a *crystalline* FeCoB ferromagnetic layer, Petitioner changes course. Here, Petitioner relies on Wang (instead of Sunai) as a secondary reference that purportedly would have motivated a POSA to modify Bowen to add boron to its ferromagnetic layer. Petition at 47.

⁷ Ground 3's reliance on Soukup is "optional" for the independent claims. Petition, 6.

If Petitioner had filed this IPR in the same timeframe as its Petition in IPR2024-01386 – instead of staggering the filing of this Petition to gain the benefit of seeing Patent Owner’s arguments – Petitioner would have made the same argument based on Sunai that proved fatal in IPR2024-01386. Petitioner’s reliance on a different secondary reference is a clear example of Petitioner using Patent Owner’s prior arguments as a roadmap in an attempt to correct a fatal deficiency that Patent Owner identified in Petitioner’s earlier-filed grounds. That is unfair to Patent Owner and warrants discretionary denial. *General Plastic*, IPR2016-01357, Paper 19 at 21.

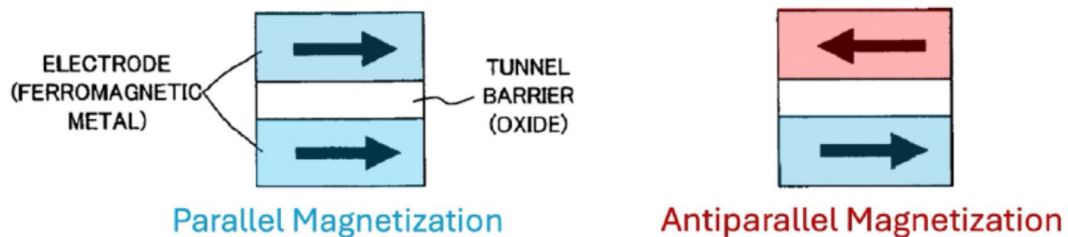
b. Arguing that Lowering the Barrier Height Would Lower R_{ap} Relative to R_p

The ’138 Patent has dependent claims that require a barrier height in a range of 0.2-0.5 eV. *See* EX1011 at claims 4, 10 and 13. The Petition highlights this limitation as purportedly being “critical” during prosecution. Petition, 66-68. This exact limitation appears in every claim of two other patents in the family, *i.e.*, Patents Nos. 7,884,403 (EX1001) and 8,319,263 (EX1003) that were the subject of Petitioner’s failed earlier-filed IPRs (IPR2024-01384 and IPR2024-01385, respectively). *See supra* § II.B.

In its two earlier-filed IPRs, Petitioner acknowledged that none of the primary references used in the grounds taught a barrier height within the claimed range, but Petitioner argued that a POSA would have been motivated to lower the

barrier height to a value within the claimed range to lower a property of the device called “tunnel magnetoresistance ratio” (“TMR”). EX2011, at 38 and EX2013 at 38.

In simple terms, an MTJ device is magnetoresistive because it has a resistance to current flow between its electrodes and that resistance changes based on the magnetic state of the device. An MTJ device has two states illustrated below. The device is in a “parallel” state when its magnetic electrodes are magnetized in the same direction and in an “antiparallel” state when its electrodes are magnetized in opposite directions.



An MTJ device has a resistance R_{ap} in its antiparallel state that is higher than its resistance R_p in its parallel state. It is undisputed that the tunnel magnetoresistance ratio (TMR) of an MTJ device represents the difference between the device’s antiparallel resistance (R_{ap}) and its parallel resistance (R_p), normalized by the parallel resistance (R_p), as shown by the formula below.

$$\text{TMR} = \frac{\Delta R}{R_p} = \frac{R_{ap} - R_p}{R_p}$$

In its petitions in IPR2024-01384 and IPR2024-01385, Petitioner alleged that a POSA would have been motivated to lower the barrier heights of the MJT devices disclosed in the primary references because doing so allegedly would have increased TMR by lowering the MJT device's resistance (R_p) in its parallel state. EX2011 at 38 and EX2013 at 38. Patent Owner explained that that assertion was facially deficient because it ignored the impact that lowering the barrier height would have had on the MJT device's resistance (R_{ap}) in its antiparallel state. EX2012 (IPR2024-01384 POPR) at 18-31 and EX2014 (IPR2024-01385 POPR) at 18-30. The above-discussed TMR equation is quite simple and reveals that lowering the barrier height would only increase TMR if it caused the parallel resistance R_p to be reduced by a *proportionally greater amount than the antiparallel resistance R_{ap}* . Because Petitioner ignored the impact that reducing the barrier height would have had on R_{ap} , Patent Owner explained that Petitioner's showing in its two earlier-filed IPRs was facially deficient. *Id.*

After seeing Patent Owner's arguments demonstrating this fatal flaw in its earlier-filed petitions, Petitioner changed its argument in this Petition in an attempt

to remedy that fatal flaw. The Petition (quoting Petitioner’s expert⁸) alleges that “lowering barrier height can decrease R_p *relative to R_{ap} due to the lack of band matching in the anti-parallel electrodes.*” Petition, 24 (quoting EX1024 ¶156). The arguments that lowering the barrier height “can decrease R_p *relative to R_{ap}* ” and that this is allegedly so “*due to the lack of band matching in the anti-parallel electrodes*” (*id.*) are both new. Neither argument appears in any of Petitioner’s earlier-filed petitions, and these new arguments plainly seek to address a fatal deficiency in Petitioner’s earlier-filed petitions that Patent Owner identified.

Petitioner strategically timed the filing of this Petition so that it was filed (March 6, 2025) a week before the Board issued its institution decisions in IPR2024-01384 (March 13, 2025) and IPR2024-01449 (March 14, 2025). Thus, when Petitioner filed this Petition it did not know how the Board would rule on the above deficiency that Patent Owner identified. That this deficiency was not the basis for denial of institution in IPR2024-01384 or IPR2024-01449 – because the

⁸ Petitioner does not cite a single prior art reference that supports the assertion that lowering the barrier height would lower the TMR for any reason. Petitioner’s reliance on expert testimony instead of prior art and printed publications is another reason why this case should be discretionarily denied. *See infra* § III.D.

Board denied both on the merits for other reasons⁹ – does not excuse Petitioner’s use of Patent Owner’s arguments in the earlier IPRs as a roadmap in an attempt to strengthen its challenge in this Petition to dependent claims (claims 4, 10 and 13) that the Petition itself noted are “critical” (Petition, 66-68) in the event that institution is granted and a trial is held that will address these claims.

3. Petitioner’s Use of Patent Owner’s Prior Arguments as a Roadmap Warrants Discretionary Denial

Petitioner had every opportunity to have the merits of a petition challenging the ’138 Patent considered by the Board along with Petitioner’s other eight petitions that challenged other members of this patent family using the same prior art as this Petition. Instead, Petitioner made the strategic decision to wait to file this Petition until five months after the others to grant itself the “opportunity to *study Patent Owner’s Preliminary Response[s].*” *General Plastic*, IPR2016-01357, Paper 19 at 21; *supra* §§ III.B.1-2. Petitioner then modified its grounds in an attempt to overcome deficiencies that Patent Owner identified in Petitioner’s

⁹ There were dissents in IPR2024-01384 and a decision in IPR2024-01494 that credited the conclusory testimony of Petitioner’s expert that lowering the barrier height would lower TMR. Those findings demonstrate Petitioner’s over-reliance on expert testimony (*infra* § III.D) and the risk of inconsistent results in the litigation (*infra* § III.C).

earlier-filed grounds. For the same reasons the Board noted in *General Plastic*, that is an abusive and inefficient use of the IPR process and unfair to Patent Owner. *General Plastic*, IPR2016-01357, Paper 19 at 21. The Director should discretionarily deny this Petition so that Petitioner's gamesmanship is not rewarded.

C. A Trial Would be Inefficient and Duplicative of the Litigation Where the Same Issues Will Need to be Addressed

Because Petitioner waited so long to file this IPR, the Board has already issued institution decisions for the other eight patents in the same family. The table below summarizes the status of Petitioner's IPRs across the entire patent family. Four IPRs (highlighted purple) were denied institution on the merits, three IPRs (highlighted green) were instituted,¹⁰ one IPR (highlighted red) challenged a patent that has been disclaimed, and the present IPR (highlighted gray) is pending.

¹⁰ The three instituted IPRs each is subject to a pending petition for Director Review seeking termination.

Table 2

	IPR No.	Challenged Patent No.	Date IPR Filed	Institution Decision
1	IPR2024-01384	7,884,403	Aug. 30, 2024	Denied
2	IPR2024-01385	8,319,263	Aug. 30, 2024	Denied
3	IPR2024-01386	9,608,198	Aug. 30, 2024	Denied
4	IPR2024-01449	9,123,463	Sept. 16, 2024	Denied
5	IPR2024-01447	8,405,134	Sept. 16, 2024	Granted (April 21, 2025)
6	IPR2024-01448	11,737,372	Sept. 16, 2024	All claims disclaimed
7	IPR2024-01493	10,680,167	Sept. 27, 2024	Granted (April 30, 2025)
8	IPR2024-01494	11,968,909	Sept. 27, 2024	Granted (April 30, 2025) 6 claims disclaimed
9	IPR2025-00701	10,367,138	March 6, 2025	<i>pending</i>

Even if an IPR were instituted in this case, the validity of the four members of the patent family highlighted purple in Table 2 will need to be addressed in the district court litigation. The '138 Patent claims share many common limitations with the purple-highlighted patents as discussed *infra* § III.C.1. That is reinforced by the fact that Petitioner's failed IPRs challenging those purple-highlighted

patents all alleged obviousness based on the same prior art used in this Petition.

Rather than being a “true alternative” to district court litigation, an IPR trial to determine whether Petitioner’s prior art meets the ’138 Patent would be an inefficient duplicative proceeding that would create the risk of inconsistent results because irrespective of whether the Board conducts such a trial on the ’138 Patent, the district court is going to need to address (1) many of the *same claim limitations*, (2) the *same prior art* and (3) the *same extensive secondary consideration evidence* in addressing the validity of the purple-highlighted patents that were the subject of Petitioner’s failed IPRs. *See Motorola Solutions*, IPR2024-01205, Paper 19 at 3-4 (decision by the Director vacating institution and denying an IPR because the trial would not have been a true alternative to a district court litigation); *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 12 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”) (“concerns of inefficiency and the possibility of conflicting decisions” in a related litigation weigh in favor of discretionary denial).

1. The Litigation Will Address Petitioner’s Same Argument that a POSA Would Have Lowered an MTJ Device’s Barrier Height to Increase TMR

Three claims of the ’138 Patent require an MJT device with a barrier height in a range of 0.2-0.5 eV. *See* EX1011 at claims 4, 10 and 13. Every claim of Patents Nos. 7,884,403 (EX1001) and 8,319,263 (EX1003) – purple-highlighted in

Table 2 and the subject of Petitioner's failed IPRs (IPR2024-01384 and IPR2024-01385, respectively) – have exactly the same limitation.

Across all nine of its IPRs and in the district court litigation, Petitioner has never identified a *single* prior art reference that discloses a magnetic tunnel junction device meeting the claim limitations with a barrier height in this claimed range.¹¹ The Petition resorts to an allegation that this would have been obvious. Petition, 23-28. Petitioner made the same argument in its failed IPRs challenging Patents Nos. 7,884,403 and 8,319,263. EX2011 at 37-40, EX2013 at 37-40.

If a trial were instituted in this IPR, to prove any of dependent claims 4, 10 and 13 unpatentable, Petitioner would need to persuade the Board that a POSA had reason to implement an MJT device with a barrier height in the range of 0.2-0.5 eV with a reasonable expectation of success. Petitioner will advance the exact same argument in challenging the validity of every claim of Patent Nos. 7,884,403 (EX1001) and 8,319,263 (EX1003) in the district court litigation. The inefficient duplication of effort would be compounded because in addressing Petitioner's obviousness arguments here the Board would have to weigh the very same

¹¹ Petitioner relies solely on Soukup (EX1028) which discloses a device that is not a magnetic tunnel junction device and indeed is not even magnetic. Petition, 23-28.

extensive secondary consideration evidence that will be considered in the district court litigation. *See infra* § III.C.2.

Even if Petitioner were to somehow succeed on this argument before the Board, that would not obviate the duplicative effort in the district court litigation. That is because, as discussed *infra* § III.C.3, no estoppel would apply to the separate claims in Patents Nos. 7,884,403 and 8,319,263 that are at issue in the litigation. Petitioner would still need to separately prove the claims of those patents invalid in the district court. Thus, a trial here would be inefficient and unnecessarily duplicative of the district court litigation, rather than an “alternative” to litigation, and would create the risk of inconsistent results before the Board and the district court on the same issue which weighs in favor of discretionary denial. *Motorola Solutions*, IPR2024-01205, Paper 19 at 3-4; *Fintiv*, IPR2020-00019, Paper 11 at 12 (“concerns of inefficiency and the possibility of conflicting decisions” in a related litigation weigh in favor of discretionary denial).

2. The Parties and the Court are Going to Need to Address the Same Secondary Consideration Evidence the Board Would Address at Trial

All the Petition’s grounds are based on alleged obviousness. Petition, i-vii. Any invalidity challenge Petitioner will raise against at least Patents Nos. 7,884,403 (EX1001) and 8,319,263 (EX1003)—which also recite a barrier height in a range of 0.2-0.5 eV—in the district court litigation will also be based on

alleged obviousness. The grounds in Petitioner’s failed IPRs challenging these patents only advanced obviousness grounds because Petitioner has identified no anticipatory prior art. EX2011 at ii-x; EX2013 at ii-iv.

It is black letter law that secondary consideration evidence is always highly relevant to an obviousness analysis. *Apple v. Samsung*, 839 F.3d 1034, 1052-53 (Fed. Cir. 2016) (en banc) (“evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not. It is to be considered as part of all the evidence, not just when the decision maker remains in doubt after reviewing the art.”); *KSR v. Teleflex*, 550 U.S. 398, 406 (2007); *Graham v. John Deere*, 383 U.S. 1, 17–18, 36 (1966). Thus, if the Board were to conduct a trial in this IPR, the Board would need to address substantial objective evidence of non-obviousness. A sampling of the evidence is discussed below – more will be submitted with the POR in the event of a trial.

The effort that the Board and the parties would expend in an IPR trial in addressing this evidence would be duplicative of the same effort in the district court litigation in connection with Petitioner’s obviousness challenges to at least Patents Nos. 7,884,403 (EX1001) and 8,319,263 (EX1003) that were the subject of Petitioner’s failed IPRs. It would also create the risk of inconsistent results if the

evidence is weighed differently by the Board than it is in the district court litigation.

The Petition ignores secondary consideration entirely. There is no justification for that. Petitioner cannot dispute that it was aware of the way those skilled in the art contemporaneously reacted to Dr. Yuasa's work. As the below-discussed evidence shows, his foundational papers on the work described in the '138 Patent have been cited by others in the field over 5,000 times, evidencing the groundbreaking nature of his discoveries, and many prestigious scientific awards and prizes have been awarded wholly, or in part, to Dr. Yuasa. *See infra* § III.C.2.a. Indeed, extensive evidence of industry praise, failure of others, long felt but unmet need, and commercial success appears in the Petition's own exhibits, statements made by Petitioner's own employees, and in the district court complaint served on Petitioner before the filing of this Petition. *See* EX1063 (Complaint), ¶¶12, 21-26. The Petition's failure to address evidence of secondary considerations that Petitioner was aware of alone warrants denial of the Petition. *See Robert Bosch v. SD3*, IPR 2016-01751, Paper 15 at 23-24 (PTAB March 22, 2017).

The following discusses just some of the secondary consideration evidence the POR would present if a trial were instituted.

a. Industry Praise

Shortly after filing the two Japanese patent applications to which the '138 Patent claims priority on March 12, 2004 and October 28, 2004, Dr. Yuasa disclosed his invention by publishing his results of Fe/MgO/Fe MTJs in the Japanese Journal of Applied Physics ("Yuasa JJAP paper") and in Nature Materials ("Yuasa NM paper") on April 2 and October 31 of the same year, respectively, and of CoFeB/MgO/CoFeB MTJs in Applied Physics Letters ("Yuasa APL paper") on February 23, 2005. EX2016; EX2017; EX2018.

Dr. Yuasa's discoveries drew immediate attention and praise from across the industry and research community, including from Petitioner's own employees. A 2005 textbook characterized Dr. Yuasa's devices as having "unprecedentedly large TMR ratios" and Dr. Yuasa's "junction with a crystalline (001) MgO barrier but using amorphous CoFeB electrodes" as "[t]he most recent developments at the time of writing." EX2019, 591-592.

The research community hailed the importance of Dr. Yuasa's discoveries. When giving a "historical overview" of spintronics, Nobel laureate Albert Fert specifically referred to Dr. Yuasa's NM paper as an "important breakthrough" in "the most important step [of] the transition from MTJ with amorphous tunnel barrier (alumina) to single-crystal MTJ and especially MTJ with MgO barrier."

EX2020, 8. This “breakthrough” is seen in the figure below from a textbook by Dieny (EX1057) that Petitioner itself submitted.

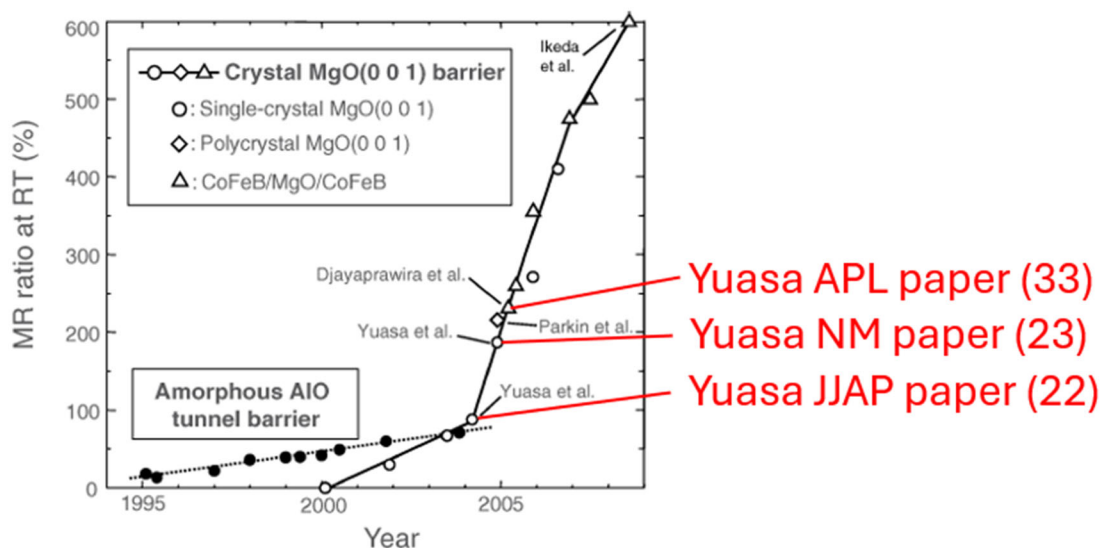


Figure 2.21 History of improvement in MR ratio at RT for MTJs with amorphous AlO barrier (solid circles) or crystalline MgO(0 0 1) barrier (open symbols). Data are shown for work by Yuasa et al. (22,23), Parkin et al. (24) Djayaprawira et al. (33), and Ikeda et al. (36).

EX1057, Figure 2.21 (annotated). The chapter in Dieny (EX1057) in which the excerpted Figure 2.21 above appears was authored by Dr. Yuasa. But the facts illustrated in Figure 2.21 are beyond dispute. That Figure demonstrates the dramatic improvements in MR (which the Petition calls the TMR) were achieved and disclosed by Dr. Yuasa in his papers. EX2016, 588, EX2017, 868; EX2018, 1. Indeed, Dr. Yuasa’s work spurred sufficient improvements in MR to make MTJs a reality in commercial devices like those in Petitioner’s hard disk drives.

According to Google Scholar, Dr. Yuasa’s NM paper has been cited more than 4,100 times and Yuasa’s APL paper has been cited more than 1,200 times. EX2002; EX2003.

Significant industry praise came from Petitioner itself. In a 2006 review co-authored by Petitioner's employee Chando Park, Dr. Yuasa's NM paper was hailed as one of "two independent experimental investigations [that] showed greater than 180% and 220% TMR ratios at room temperature" and that because the industry was so "[e]ncouraged by these two studies, a surge in research quickly followed" that "continues to this day." EX2021, 38; EX1063, ¶22. The same review article by Petitioner's own employee also recognized that "[t]he development of CoFeB/MgO/CoFeB tunnel junctions [in Yuasa APL paper] provides a practical solution to overcome" the difficulty of growing crystalline (BCC) Co or Fe with (001) texture without a single crystal substrate. *Id.*, 39. This praise is echoed by another of Petitioner's employees, Zheng Gao, who commented that Dr. Yuasa's "result motivated many researchers in industry and academia to further pursue the potential of MgO-based TMR," and noted that "[t]he significance of" the Yuasa APL paper was "not only the high MR ratio, but also that it was a fully integrated film directly produced from sensor deposition sputtering tool" because "amorphous (*a*)-CoFeB was used to promote strong (001) MgO texture in the as-deposited state; post annealing transforms *a*-CoFeB layer from amorphous to a (001)-textured polycrystalline CoFe layer." EX2022, 107.

Petitioner itself has repeatedly cited Dr. Yuasa's work in journal publications as well as in Petitioner's own patent applications. *See* EX1063 ¶¶21-

26, citing EX2043, EX2021, EX2044, EX2045, EX2046, EX2047, EX2048, EX2049 (US 8,254,067), EX2050 (US 8,336,194), EX2051 (US 9,287,494), EX2052 (US 6,650,513); *see also* EX2054, 1, 32, 79 (showing Petitioner's ownership of US 6,650,513 and US 8,254,067).

TDK group, a competitor to Petitioner, also offered praise for the Yuasa APL paper:

Their results are of significant technology importance for the magnetic recording head industry because they deposited MTJs with standard spin-valve structure technology performed at room temperature . . . After demonstrating superior performance compared to Al₂O₃ TMR as shown in Fig. 2, MgO TMR became the state-of-art technology for all future spintronic devices including HDD recording read heads.

EX2023, 2.

For his groundbreaking work related to the invention of the '138 patent, Dr. Yuasa has been awarded or co-awarded many prizes, including:

- The 23rd (FY2022) Japan Society of Applied Physics Achievement Award, for "Pioneering research on magnesium oxide magnetic tunnel junctions." EX2024, EX2025.
- 2021 IEEE Fellow, "for contributions to MgO-based magnetic tunnel junctions." EX2026.

- Future Creative Invention Prize at the National Commendation for Invention (2021), for “invention of textured MgO-based magnetic tunnel junctions for advanced magnetic recording and memory.” EX2027.
- The Science and Technology Prize (2016), by the Minister of Education, Culture, Sports, Science and Technology for “Studies on giant tunnel magnetoresistance effect.” EX2028, EX2029.
- IEEE Magnetics Society Distinguished Lecturer Award (2012), for “achievement of the giant TMR effect in MgO-based MTJ.” EX2030. The IEEE Magnetics society profile notes that “[Dr. Yuasa’s] most important scientific achievements are the development of MgO-based MTJs including CoFeB/MgO/CoFeB-type MTJs and their applications to read heads of hard disk drives and STT-MRAM.” EX2031.
- JSPS Prize (2010) on “Development of High Performance Magnetic Tunnel Junction Devices.” EX2028.
- Tsukuba Prize (2009 – 5 million yen) on “Discovery of giant tunnel magnetoresistance in MgO-based magnetic tunnel junctions and its industrial applications.” EX2032, EX2033, EX2028.
- Inoue Harushige Prize (2009) on “Magnesium oxide tunnel magnetoresistive element and its mass production technology.” EX2028, EX2034, EX2035.

- Prime Minister Prize (2008) on “Development of high-performance magnetic tunnel junctions for ultra-high-density hard disk drives.” EX2028.
- Asahi Award (2008) on “Studies on development and application of tunnel magnetoresistive effect.” EX2036, EX2028.
- IBM Japan Science Prize (2007) on “Studies on tunnel magnetoresistive effects and their application.” EX2028.
- Tokyo Techno Forum 21 Gold Medal Prize (2006) on “Study on spintronics technology for MRAM.” EX2028.
- Marubun Science Prize (2006) on “Study on tunnel magnetoresistance effect.” EX2028.
- Ichimura Science Prize (2005). EX2028.

See also EX1063, ¶12.

b. Commercial Success

Petitioner, along with the entire hard disk drive industry, has reaped the benefit of great commercial success based on the '138 Patent. “GMR had been primarily used as spin-valve magnetoresistive heads in HDDs between 1998 and 2004. It was subsequently replaced by TMR heads, which exhibit even larger magnetoresistance.” EX1057, 8. According to Petitioner’s own employees, “[w]ith [] the advent of low resistance-area MgO tunnel barriers, the industry

transitioned to TMR sensors in 2006, which now easily exhibit > 50% TMR.”

EX2038 (book chapter authored by Petitioner’s employees), 4.

3. Even if Petitioner Were to Prevail at Final Written Decision, No Estoppel Would Apply to Any Claim in Patent Owner’s Other Patents Asserted in the Litigation

A patent challenger need only meet a lower standard of proof (preponderance of evidence) to prove a claim unpatentable before the Board than the higher standard of proof (clear and convincing) the challenger would need to meet to prove a claim invalid in district court. As the Federal Circuit recently confirmed, because of the different standards of proof, a finding of unpatentability of a claim by the Board in a final written decision after an IPR trial does not create collateral estoppel and is not binding in a district court proceeding for any *other* claim,¹² even a claim that is “immaterially different ... for purposes of invalidity” from the claim the Board found unpatentable. *Kroy IP v. Groupon*, 127 F.4th 1376, 1380-81 (Fed. Cir. 2025) (“We hold that a prior final written decision of the Board of unpatentability on separate patent claims reached under a preponderance

¹² While the specific claims found unpatentable by the Board cannot be asserted in district court, that is because of “the retroactive cancellation of [those] certain claims as a matter of law” rather than collateral estoppel based on the Board’s “fact findings.” *Kroy*, 127 F.4th at 1381.

of the evidence standard cannot collaterally estop a patentee from asserting other, unadjudicated patent claims in district court litigation.”); *see also ParkerVision v. Qualcomm*, 116 F. 4th 1345, 1360-61 (Fed. Cir. 2024).

Thus, even if Petitioner were to prevail at final written decision, that would not avoid the need for the parties and the court to address many of the very same issues in the district court litigation. A trial here would be inefficient and unnecessarily duplicative of the district court litigation, rather than an “alternative” to litigation, and would create the risk of inconsistent results before the Board and the district court on the same issues which weighs in favor of discretionary denial. *Motorola Solutions*, IPR2024-01205, Paper 19 at 3-4; *Fintiv*, IPR2020-00019, Paper 11 at 12 (“concerns of inefficiency and the possibility of conflicting decisions” in a related litigation weigh in favor of discretionary denial).

D. The Petition Overly Relies on Expert Testimony to Fill a Gap in the Prior Art

A relevant consideration identified in the Interim Processes Memo was “[t]he extent of the petition’s reliance on expert testimony.” Interim Processes Memo, at 2. As the Board’s recent guidance notes, “[t]he statute and our reviewing court require that petitions be based on *prior art patents and printed publications*” rather than expert testimony.¹³ Thus, “extensive reliance on expert

¹³ FAQ 21—*see supra* note 1.

testimony and/or reasonable disputes between experts on dispositive issues may suggest that the questions are better resolved in an Article III court.” *Id.*

The Director’s recent *Irhythm Technologies* case explained that over-reliance on expert testimony may be present where a petition seeks to “fill gaps in the prior art” by citation to expert testimony that cites no patent or printed publication to support the expert’s testimony. *Irhythm Technologies*, IPR2025-00363, Paper 10 at 2-3. The Director discretionarily denied the case on other grounds but noted that the petition’s reliance on expert testimony did not weigh in favor of denial because “Patent Owner does not identify any portions of the expert testimony that suggest Petitioner is *using its expert to fill gaps in the prior art*. Instead, Petitioner appears to rely on its expert to explain the background knowledge of a person of ordinary skill in the art, and the *expert provides citations to evidence in support of his statements in the required manner*. See 37 C.F.R. § 42.65(a); *Xerox v. Bytemark*, IPR2022-00624, Paper 9 (Aug. 24, 2022) (precedential).” *Id.*

But here, unlike in *Irhythm Technologies*, the Petition over-relies on expert testimony because on at least one dispositive issue discussed below, the Petition relies exclusively on expert testimony that is unsupported by citation to any patent or printed publication to fill a gap in the prior art. That is an additional reason why institution should be denied.

The technology at issue in this case (quantum physics) is extremely complicated and was not well-understood at the time of the invention. Petitioner's own prior art references make this clear. The authors were explicit that they could only speculate as to why certain results were seen, and in one case the Petitioner's relied-upon reference even reported results that the *author admitted* in a later publication *were wrong*. EX1028 (Soukup); EX2053 (Soukup-Dissertation) ; EX2012 (IPR2024-01384 POPR), 40-44 (explaining Soukup itself teaches the methodology used to calculate a barrier height of 0.33 eV was wrong). The uncertainty in this complex field is reinforced by the contemporaneous praise the inventor received when he achieved results that far exceeded expectations. *Supra* § III.C.2. If the Board were to institute an IPR trial, Patent Owner would dispute the testimony of Petitioner's expert because it is wrong in critical respects. Petitioner's expert testimony will be refuted not only by Patent Owner's expert, but by extensive evidence in the form of patents and printed publications that memorialize the contemporaneous reaction of those in the field who widely praised the inventor's work. The disputed issues would most certainly be better resolved before the district court. FAQ 21 ("reasonable disputes between experts on dispositive issues may suggest that the questions are better resolved in an Article III court").¹⁴ Indeed, the district court is going to need to resolve most, if not all,

¹⁴ See *supra* note 1.

of the same issues in addressing the four patents from the same family that were the subject of Petitioner's failed IPR petitions. *See supra* §§ III.C.1-2. The Board should not devote its limited resources to having a trial to evaluate the Petition's grounds that hinge entirely on expert testimony, particularly where doing so would be duplicative of the same evaluation that will need to take place in the district court action irrespective of the outcome here.

Almost half of the fourteen challenged claims require a magnetic tunnel junction (MTJ) device having a barrier height in the range of 0.2-0.5 eV. *See* claims 4-5, 10-11 and 13-14. Neither the Petition nor its expert declaration cites a single prior art reference that teaches the claimed MTJ with a barrier height within this range. Every one of the Petition's grounds (Grounds 1-3) relies on an obviousness combination including at least three references (Petition, 6) and Soukup to purportedly teach a barrier height within the claimed range. *See e.g.*, Petition, 24-28 (Ground 1) and 58-61 (Ground 3). But it is undisputed that Soukup's devices are not MTJs. Soukup's devices were gold-MgO-gold diodes that were not even magnetic. EX1028 (Soukup), 3233 ("Experimental results have been presented for the I-V characteristics of vacuum-deposited Au-MgO-Au emission diodes.").

For Grounds 1-2,¹⁵ the Petition alleges that Soukup discloses a barrier height of 0.33 eV and that a POSA “would have been motivated to apply Soukup’s teachings about an MgO thin-film barrier with a ‘barrier height’ of ‘about 0.33 eV’ to Parkin’s MgO barrier as modified by Wang.” Petition, 24-26 (citing Petitioner’s expert in EX1024 ¶¶156-158). It is black letter law that Petitioner had to establish some reason *why* a POSA would have sought to use Soukup’s alleged barrier height of 0.33 eV in an MTJ device like Parkin’s “as modified by Wang.” *Id.*; *KSR*, 550 U.S. at 418 (2007) (establishing obviousness requires establishing “a reason” for a skilled artisan “to combine the elements in the way the claimed new invention does”). The Petition’s attempt to establish some reason *why* a POSA allegedly would have been so motivated makes the following allegation “supported” only by citation to Petitioner’s expert:

One of skill in the art looking to increase TMR of an MgO barrier would have been motivated to explore lower barrier heights to facilitate tunneling of parallel electrons. *EX1024* ¶158. Thus, one of skill seeking to improve Parkin’s MgO MTJ would have looked to Soukup’s teachings about MgO barriers and how defects lowered the barrier height. *Id.*

¹⁵ Ground 2 challenges claims 5, 11 and 14 that depend from claims 1, 10 and 13, respectively, and makes no separate showing in an attempt to meet the claimed barrier height.

Petition, 25; *see also Id.*, 27 (“one of skill would have been motivated to adjust oxygen vacancy defects to improve TMR by lowering the barrier height as taught by Soukup. *EX1024* ¶¶163-66.”).

Thus, the Petition alleges that a POSA would have used Soukup’s alleged barrier height of 0.33 eV in the Parkin-Wang MTJ device “to improve TMR by lowering the barrier height.” Petition, 27. But as the above quotations from the Petition lay bare, the only *evidence* the Petition cites to support its assertion that a POSA would have expected that lowering the barrier height would increase TMR is Petitioner’s expert. Petitioner’s expert does not cite a single patent or printed publication to support his conclusory assertion that a POSA would have believed that lowering the barrier height would increase TMR. *See EX1024* ¶158 (cited Petition, 25) (“To increase TMR of an MgO barrier, skilled artisans would have been motivated to explore lower barrier heights to facilitate tunneling of parallel electrons.”) (*citing nothing*); *EX1024* ¶163 (cited Petition, 27) (“One of skill would have been motivated to adjust oxygen vacancies to improve TMR by lowering the barrier height.”) (*citing nothing*); *EX1024* ¶¶164-166 (cited Petition, 27) (citing references to support different technical points but citing no reference to purportedly establish that a POSA would have believed that lowering the barrier height would improve TMR).

The Petition makes the same assertion in connection with Ground 3, once again alleging that a POSA would have been motivated by Soukup to lower the barrier height of an MTJ device to increase TMR and once again “supporting” that assertion solely by citation to Petitioner’s expert. Petition, 60 (“[o]ne of skill in the art looking to increase TMR of an MgO barrier would have been motivated to explore lower barrier heights to facilitate tunneling of parallel electrons. **EX1024 ¶305.**”); EX1024 ¶305 (“To increase TMR of an MgO barrier, skilled artisans would have been motivated to explore lower barrier heights to facilitate tunneling of parallel electrons.”) (*citing nothing*).

The assertion that a POSA would have believed that lowering the barrier height would have increased TMR is the *only* reason the Petition offers for why a POSA would have allegedly used Soukup’s barrier height of 0.33 eV in every ground’s combination. But in its response to this paper, Petitioner will be unable to identify for the Director a single prior art patent or publication, cited in the Petition or the expert declaration, that teaches that lowering the barrier height would have increased TMR. Petitioner’s assertion is based on nothing but the naked say-so of its expert. Worse yet, that assertion is simply wrong.

If the Board were to conduct a trial, Petitioner would present its own expert testimony explaining why the assertion by Petitioner’s expert that a POSA would have believed that lowering the barrier height would increase TMR is wrong.

Indeed, Patent Owner's expert will explain that exactly the opposite was true – that a POSA would have expected that lowering the barrier height would have undesirably decreased TMR – not increased TMR as Petitioner alleges. And Patent Owner's expert testimony will – unlike Petitioner's – be corroborated by teachings in the prior art. For example, EX1038 (at page 4729)¹⁶ explained that TMR (simply called “MR”) shows “strong decrease as the bias increased” and that “[w]ith the increase in dc bias, the effective barrier height decreases.” This shows the exact opposite of the correlation that Petitioner's naked expert testimony alleges because it establishes that a POSA would have expected that lowering the barrier height would have undesirably decreased the TMR – not desirably increased it as Petitioner alleges.

The Petition's reliance on naked expert testimony to make its case warrants discretionary denial under the recent guidance from the Board and the Director. The Petition's reliance on uncorroborated expert testimony to try to fill a gap in the teachings of the prior art established via patents and printed publications is improper. FAQ21¹⁷ (“[t]he statute and our reviewing court require that petitions be based on prior art patents and printed publications”); *Irhythm*, IPR2025-000363,

¹⁶ This is Petitioner's own evidence submitted with the Petition.

¹⁷ See *supra* note 1.

Paper 10 (suggesting that a Petitioner “using its expert to fill gaps in the prior art” would warrant discretionary denial). The failure of Petitioner’s expert to “provide[] citations to evidence in support of his statement[– that a POSA would have expected that lowering the barrier height would increase TMR –] in the *required manner*” further warrants discretionary denial. *Irhythm*, IPR2025-000363, Paper 10 (citing Rule 42.65(a); *Xerox*, IPR2022-00624, Paper 9).

The fact that the overly-relied-on testimony of Petitioner’s expert will be “reasonably dispute[d]” further suggests that the question of whether a POSA would have expected lowering the barrier height to increase TMR is “better resolved in an Article III court. FAQ21.¹⁸ That is particularly true here given that, irrespective of whether the Board were to conduct a trial in this IPR, the district court is going to need to resolve this very same issue in connection with other patents in the family that were the subject of Petitioner’s failed IPRs. *See supra* § III.C.

Additionally, the efficiencies to be gained by having this issue addressed solely in the district court would be further compounded if the Director were to discretionarily deny the other three IPRs that the Board instituted a trial on and for which a request for Director Review is pending. For example, the patent claims at issue in one of those instituted IPRs also recite an MTJ device with a barrier height

¹⁸ *See supra* note 1.

of 0.2-0.5 eV and the Petition similarly relies on the naked assertion of Petitioner's expert that a POSA would have lowered the barrier height of the MTJ device described in a primary reference to Soukup's alleged barrier height of 0.33 eV because this would have increased the TMR. EX2015 (IPR2024-01494 Petition) at 33-37. Thus, if the Director were to discretionarily deny this IPR and terminate Petitioner's three instituted IPRs, this issue would be addressed in the district court litigation – where it needs to be addressed anyway (*see supra* § III.C) – rather than having this issue be inefficiently and duplicatively addressed in the district court litigation and in multiple IPR trials with the risk of inconsistent results.

Petitioner's over-reliance on expert testimony is an additional reason why this case should be discretionarily denied.

E. Discretionary Denial is Warranted Under §325(d) and *Advanced Bionics*

Step one of the two-part *Advanced Bionics*¹⁹ framework considers “whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 8. As detailed below, the Petition challenges the independent claims, and many of the dependent claims,

¹⁹ *Advanced Bionics v. MED-EL Elektromedizinische Geräte*, IPR2019-01469, Paper 6 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”).

using just three references – Bowen, Wang and Parkin. The Petition concedes that Bowen, Wang and “Parkin’s published application” were all of record during original prosecution. Petition, 68. Thus, step one is satisfied.

Where, as here, the “first part of the framework is satisfied,” step two is performed to assess “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 8. When “the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review.” *Id.*, 8-9. Petitioner did not, because it cannot, satisfy step two of the *Advanced Bionics* framework. Thus, discretionary denial under § 325(d) is warranted.

Petitioner misapplies the *Advanced Bionics* framework. Petition, 66-70. The Petition argues that *Advanced Bionics* step one is not satisfied because some of the references used in the grounds were cited on an IDS but not applied in a rejection.²⁰ Petition, 69 (citing the *JUUL Labs* case for this proposition). That argument fails under the Director’s recent decision in *Ecto World v. RAI Strategic Holdings*, IPR2024-01280, Paper 13 (May 19, 2025) (precedential as to § A)

²⁰ The Petition also repeatedly makes arguments under *Advanced Bionics* step one that would only be relevant under *Advanced Bionics* step two.

(“*Ecto World*”). Petitioner cannot meaningfully refute that *Advanced Bionics* step one is satisfied so that Petitioner thus must show error under *Advanced Bionics* step two.

The Petition’s *Advanced Bionics* step two arguments are an exercise in obfuscation. The Petition alleges that the Examiner committed error in allowing the ’138 Patent based on a “critical limitation distinguishing the prior art.” Petition, 66-67. But the limitation the Petition identifies as “critical” is the above-discussed limitation requiring a barrier height of 0.2-0.5 eV that appears only in *dependent* claims. *Id.*; *supra* § III.C. This limitation that only appears in dependent claims could not have been “critical” to the Examiner in allowing the ’138 Patent. In allowing the claims of the ’138 Patent the Examiner manifestly found the *independent* claims to distinguish over the prior art. Petitioner cannot demonstrate error in that finding.

Every ground that challenges the independent claims alleges that the claims would have been obvious over references that were of record during prosecution and were known to those in the field. Petitioner’s hindsight assertion that the inventor’s work would have been obvious is refuted by the contemporaneous reaction of those in the field – including employees of Petitioner Western Digital – who widely applauded the groundbreaking nature of the invention. *See supra* § III.C.2. The hindsight assertion today by Western Digital’s lawyers and its paid

expert that the invention would have been obvious is refuted by the contemporaneous reaction of Western Digital's own employees working in the field at the time. Petitioner cannot demonstrate that the examiner committed material error where the examiner's determination of the merits of the claimed invention mirrored the contemporaneous reaction of those skilled in the art at the time.

Additionally, as explained below, Petitioner's assertion of material error is also refuted by the Board's decision denying institution in IPR2024-01386 which rejected similar arguments to the obviousness arguments the Petition advances here.

1. *Advanced Bionics* Step One

The Petition only challenges the independent claims (claims 1, 7 and 12) in Grounds 1 and 3. Ground 1 challenges the independent claims (and dependent claims 2-3 and 8-9) based on alleged obviousness over Parkin and Wang, and Ground 3 challenges the same group of claims based on alleged obviousness over Bowen and Wang. Petition, 6 (stating that "Soukup is optional in the combinations for Claims 1-3, 7-9, and 12"). Thus, every independent claim, and nine of the fourteen challenged claims, are challenged based on ***Bowen, Wang and Parkin***.

Step one of the *Advanced Bionics* framework is satisfied. It is undisputed that Bowen, Wang and "Parkin's published application" were all of record during

prosecution and considered by the Examiner. Petition, 68 (admitting that Bowen and Wang were cited on an IDS and that “Parkin’s published application (US 2006/0003185)” was cited by the Examiner “to reject claims”); EX1012, 206, 308-309.

The Petition concedes that Bowen and Wang were cited on an IDS. The Petition cites to a non-precedential decision to suggest that “mere prior citation of prior art in an IDS will not automatically satisfy the first prong of the analytical framework set forth in *Advanced Bionics*.” Petition, 69 (*citing JUUL Labs. v. NJOY*, IPR2024-00160, Paper 10, 11-12 (May 24, 2024)). Petitioner’s assertion is directly refuted by the Director’s recent ***precedential*** decision in *Ecto World*, IPR2024-01280, Paper 13, 4 (finding *Advanced Bionics* step one met by prior art cited only in an IDS). Bowen and Wang being listed on an IDS suffices to meet *Advanced Bionics* step one. *Ecto World*, IPR2024-01280, Paper 13 at 4 (“Challenging the claims using the same prior art that was previously presented on an IDS is sufficient to satisfy the first part of the *Advanced Bionics* framework.”); *see also Keysight Technologies v. Centripetal Networks*, IPR2022-01421, Paper No. 14, 5 (Aug. 24, 2023) (Director Review) (“the first part of the *Advanced Bionics* framework does not require that an Examiner provide a ‘discussion, analysis, or other findings on the applicability’ of the relevant material contained in an IDS.”); *Advanced Bionics*, IPR2019-01469, Paper 6 at 7-8.

With respect to Parkin, Petitioner concedes that “Parkin’s published application” was “cited” by the Examiner “to reject claims.” Petition, 68. Petitioner cannot dispute that “Parkin’s published application” is “substantially the same” as Parkin. The Petition only argued that a different reference called Parkin-852 is “different from the Parkin presented in the Petition’s Grounds.” Petition, 68. The Petition never alleges that there is any material difference between Parkin and “Parkin’s published application (US 2006/0003185).” *Id.* Nor could it have. Parkin’s published application has all the same disclosure as Parkin that the Petition relies upon. “Parkin’s published application” is “substantially the same” as Parkin under § 325(d) and *Advanced Bionics* step one.

The Petition’s emphasis on Soukup not having been of record during prosecution (Petition, 68) is misplaced. The Petition only relies on Soukup to meet the above-discussed barrier height of 0.2-0.5 eV recited in ***dependent*** claims 4-6, 10-11 and 14. While the Petition lumps Soukup into Grounds 1 and 3, the Petition says that “Soukup is ***optional in the combinations for Claims 1-3, 7-9, and 12***” (Petition, 6) and the Petition’s showing for those claims never mentions Soukup. Petitioner cites no authority supporting its assertion that a reference used only to challenge dependent claims should be a factor in assessing whether *Advanced Bionics* step one is satisfied. If a Petitioner could challenge the independent claims based on prior art “previously presented to the Office” but escape discretionary

denial by applying a reference not cited during prosecution to a dependent claim, the Board’s *Advanced Bionics* analysis would be toothless.

The independent claims (and most of the dependent claims) were challenged based on just Bowen, Wang and Parkin. Bowen, Wang and a reference that is “substantially the same” as Parkin (i.e., Parkin’s published application) were all “previously presented to the Office” under § 325(d) and *Advanced Bionics* step one. *Advanced Bionics* step one is met so the *Advanced Bionics* analysis proceeds to step two.

2. *Advanced Bionics* Step Two

Under the *Advanced Bionics* framework, because step one is met, discretionary denial is warranted unless Petitioner demonstrates “that the Office erred in a manner material to the patentability of challenged claims.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 8; *see also Id.* at 8-9 (when “the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review.”). Because Petitioner cannot demonstrate that the Examiner materially erred in allowing the ’138 Patent over the disclosures in Bowen, Wang and Parkin, discretionary denial is warranted under *Advanced Bionics* step two and § 325(d).

All the challenged claims require an MTJ device with specific requirements. The MTJ device must have electrodes that each is comprised of a ferromagnetic

material layer that includes cobalt, iron and boron (CoFeB) and is “entirely crystallized,” and a barrier layer in between that comprises a magnesium oxide (MgO) layer “formed of a polycrystalline MgO in which a (001)²¹ plane is preferentially oriented.” *See* Petition, xviii-xx (listing independent claims 1, 7 and 12).

Petitioner could not find a single prior art reference that discloses such an MTJ as claimed. What the Petitioner did was to find various pieces of the claimed invention in disparate prior art references. In its obviousness grounds, Petitioner uses the claims as a template and alleges that a POSA would have put the disparate pieces of the prior art together in the claimed manner.

a. Petitioner’s Does Not Demonstrate Material Error in the Examiner’s Consideration of Parkin and Wang (Ground 1)

The Petition concedes that Ground 1’s primary reference (Parkin) has a lower electrode that is a ferromagnetic layer formed of CoFe and that does not have boron as the claims require. Petition, 10. The Petition then found a lower electrode that is a ferromagnetic layer of CoFeB in Wang and alleged that a POSA would have “substitute[d] CoFeB for Parkin’s lower CoFe reference electrode as

²¹ The reference to a 001 plane refers to a specific type of polycrystalline structure. EX2041, 14-15.

described in Wang.” Petition, 11-13. But substituting Wang’s CoFeB ferromagnetic layer into Parkin would not have met any challenged claim because Wang’s CoFeB ferromagnetic layer is “amorphous” which means that it is not “entirely crystallized” as required by every independent claim. *See* Limitations 1[d], 7[e] and 12[d] labelled in the Petition at xviii-xx; EX1055 (Wang), Abstract (“the CoFeB has an amorphous structure”). Thus, to meet the claimed requirement that the ferromagnetic be “entirely crystallized,” the Petition reverts to Parkin’s teaching of a crystalline ferromagnetic layer, despite the fact that Parkin’s lower ferromagnetic layer has no boron and despite the fact that, as the Board found in denying one of Petitioner’s earlier-filed IPRs, it was known in the art that boron inhibits crystallization. EX2010 (IPR2024-01386, Decision) at 12-16 (citing EX1030.)

Thus, in Ground 1, Petitioner asserts that a POSA would have “substitute[d] CoFeB for Parkin’s lower CoFe reference electrode *as described in Wang*” (Petition, 11-13) but then ignores Wang’s teaching that its CoFeB layer is not crystalline. This lays bare that in Ground 1 Petitioner cherry-picked disparate teachings from Parkin and Wang in an attempt to reconstruct the claims in hindsight. That does not remotely show that the Examiner materially erred by finding the claims nonobvious.

The Petitioner's *Advanced Bionics* step two analysis is deficient. With respect to Ground 1 and its challenge to the independent claims, the Petition alleges that "the Examiner was unaware in 2018 that ... Parkin taught or suggested nearly every aspect of IP Bridge's '138 Patent claim iteration." Petition, 69-70. The Examiner was fully aware of Parkin's teachings. Petition, 68 (admitting that the Examiner used Parkin's published application to reject claims). Indeed, the Petitioner's allegations about what the "Examiner apparently did not recognize" about Parkin is an exercise in obfuscation. Petition, 68-69. Specifically, the Petition alleges that the Examiner apparently did not recognize that Parkin taught "CoFeB electrodes." *Id.* But as the Petition itself concedes, Parkin only taught the use of CoFeB for its top electrode that the Petition maps to the claimed "second electrode." *See e.g.*, Petition, 15-16. Parkin's lower electrode that corresponds to the claimed "first electrode" is CoFe and is replaced in Petitioner's Ground 1 by Wang's CoFeB layer. *See e.g.*, Petition, 9-13. No evidence supports Petitioner's assertion that the Examiner failed to recognize anything about Parkin's teachings.²²

²² Petitioner's assertion that the "Examiner apparently did not recognize ... that Parkin further taught an MTJ with an MgO barrier and CoFeB electrodes (Petition, 68-69) is also wrong. *See* EX1012, 291 (describing an examiner interview that discussed Fig. 11 of Parkin's published application (called "Parkin-185") which

The Petition also says that “Wang was ... apparently never considered” by the Examiner. Petition, 68. That is directly refuted by the Examiner’s initialed IDS which indicates that Wang was “considered.” EX1012, 214.

Thus, Petitioner’s wild speculation that the Examiner did not consider Wang or somehow failed to appreciate *some* of Parkin’s teachings while appreciating others is unsupported by a single piece of evidence. It is just as likely, if not more so, that the Examiner recognized Parkin’s and Wang’s teachings but did not believe that it would have been obvious to replace Parkin’s lower ferromagnetic layer with CoFeB as taught by Wang while also ignoring Wang’s teaching that the layer is *non-crystalline*. The Examiner’s judgment that the claims were not obvious at the time is consistent with the contemporaneous praise for the invention from those skilled in the field. *See supra* § III.C.2.a.

The Examiner’s judgment is also consistent with the decision the Board reached in denying institution of Petitioner’s petition in IPR2024-01386. EX2010, 12-16. The claims at issue in IPR2024-01386 similarly require a CoFeB ferromagnetic layer with a crystalline structure. *Id.*, 5 (noting that the claims require that the FeCoB layer be “of BCC” which stands for body-centered cubic)

shows which shows CoFeB layers 515 and 565 and MgO tunnel barrier 540); EX2040 (U.S. 2006/0003185) at [0089].

and 14, 16 (noting that BCC is a particular type of crystalline structure). In IPR2024-01386, the Board rejected Petitioner’s arguments – which mirror those here –that an MJT device with a crystalline CoFeB would have been obvious because the only CoFeB ferromagnetic layer that Petitioner cited in the prior art was amorphous (i.e., not crystalline). *Id.*, at 12-16. Indeed, the Board noted that the Petition pointed to a crystalline ferromagnetic layer in the very same **Parkin** reference relied on here, but the Board correctly observed that Parkin’s layer was formed from CoFe (no boron) rather than from CoFeB as claimed. *Id.*, 13. The Board found that “the cited teachings of Sunai *support* Patent Owner’s position that ... adding boron into a ferromagnetic layer of CoFe ... suppresses crystallization.” *Id.*, 12 (emphasis original). The Board also found that the same **Wang** reference relied on in this Petition to teach a CoFeB ferromagnetic layer teaches that the layer is amorphous (i.e., not crystalline). *Id.*, 15. Thus, the Board found the testimony of Dr. Bokor – the same expert Petitioner relies on here – was “not sufficiently supported by the cited underlying evidence.” *Id.*, 13.

Petitioner cannot show material error by the Examiner in failing to adopt an obviousness theory that the Board expressly rejected in IPR2024-01386.

b. Petitioner Does Not Demonstrate Material Error in the Examiner's Consideration of Bowen and Wang (Ground 3)

Ground 3 is the other ground challenging the independent claims. The Petition fails to show material error in the Examiner's analysis of Bowen and Wang for much the same reasons as for Ground 1. The Petition concedes that its primary reference (Bowen) has a lower electrode that is a ferromagnetic layer formed of Fe rather than CoFeB as claimed. Petition, 47. Petitioner alleges that a POSA "would have been motivated to replace Bowen's ... Fe ferromagnetic material layer with a CoFeB ferromagnetic layer ... as taught by Wang. *Id.* But replacing Bowen's Fe ferromagnetic layer with Wang's CoFeB ferromagnetic layer would not have met any challenged claim because Wang's CoFeB ferromagnetic layer is "amorphous" which means that it is not "entirely crystallized" as required by every independent claim. *See* Limitations 1[d], 7[e] and 12[d] labelled in the Petition at xviii-xx; *see also* IPR2024-0138, Paper 10 at 15 (finding that Wang's CoFeB layer is not crystalline); Wang, Abstract ("the CoFeB has an amorphous structure").

As it did for Ground 1, in Ground 3 Petitioner alleges that modifications would have been made to Wang's CoFeB layer to yield a crystalline ferromagnetic layer. That argument ignores the well-known teachings in the art that boron inhibits crystallization. IPR2024-0138, Paper 10 at 12 (finding that "the cited

teachings of Sunai *support* Patent Owner’s position that ... adding boron into a ferromagnetic layer of CoFe ... suppresses crystallization.” *Id.*, 12 (emphasis original). Petitioner’s Ground 3 assertion that a POSA would have replaced Bowen’s Fe layer “with a CoFeB ferromagnetic layer ... as taught by Wang” (Petition, 47) but then would have modified Wang’s layer to make it crystalline, demonstrates that Petitioner cherry-picked disparate teachings from Bowen and Wang in an attempt to reconstruct the claims in hindsight. That does not show that the Examiner materially erred by finding the claims nonobvious.

The Petition’s *Advanced Bionics* step two analysis is deficient. With respect to Ground 3 and its challenge to the independent claims, the Petition merely alleges that “the Examiner apparently did not consider Bowen” or Wang. Petition, 68. That is directly refuted by the Examiner’s initialed IDS which indicates that Bowen and Wang were “considered.” EX1012, 212, 214. The only other assertion the Petition makes about Ground 3 – that the Examiner was “unaware in 2018 that the prior art taught or suggested ... oxygen vacancy defects (Bowen)” (Petition, 69) does not demonstrate that the Examiner committed any material error in finding the claims unobvious over Bowen and Wang as it is entirely unrelated to Petitioner’s above-discussed failure to establish that the teachings of Bowen and Wang would have led a POSA to an entirely *crystalline* CoFeB layer.

As with Ground 1, nothing supports Petitioner's wild speculation that the Examiner did not consider Bowen or Wang. It is just as likely, if not more so, that the Examiner considered these references but did not believe that it would have been obvious to replace Bowen's lower ferromagnetic layer with CoFeB as taught by Wang while also ignoring Wang's teaching that the layer is ***non-crystalline***. The Examiner's judgment that the claims were not obvious at the time is consistent with the contemporaneous praise for the invention from those skilled in the field (*supra* § III.C.2.a) and the Board's decision in denying Petitioner's petition in IPR2024-01386, Paper 10 at 12-16 (rejecting Petitioner's arguments – which mirror those here –that an MJT device with a crystalline CoFeB would have been obvious where the only CoFeB ferromagnetic layer disclosed in the prior art was amorphous (i.e., not crystalline)).

c. Petitioner's Disagreement With the Examiner Does Not Establish Error

As demonstrate *supra* §§ III.E.1-2.b, in its grounds challenging the independent claims Petitioner alleges obviousness over teachings in the art that were all of record and known to those skilled in art who contemporaneously praised the invention. Furthermore, Petitioner's obviousness arguments were already rejected by the Board in IPR2024-01386. Petitioner's disagreement with the judgement of the Examiner that the claims are nonobvious and with the decision of the Board that Petitioner failed to prove its obviousness case does not

remotely establish error. *Advanced Bionics*, IPR2019-01469, Paper 6 at 8 (“[i]f reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability.”).

d. Petitioner’s Accusations of Error in Connection with Limitations Only in Dependent Claims is Obfuscation

The Petition alleges that the Examiner committed error in allowing the ’138 Patent because “the examiner believed that a critical limitation distinguishing the prior art was MgO barrier height in the range of 0.2 to 0.5 eV” (Petition, 66) and the same examiner allegedly found this limitation be met by a Kishi reference which provides “ample reason to conclude that *Advanced Bionics* does not apply” (*id.*, 66-68). This is obfuscation twice over.

First, what Kishi allegedly shows is irrelevant to the grounds. The Petition only relies on Soukup to purportedly teach a barrier height in the range of 0.2-0.5 eV.

Second, the claimed barrier height of 0.2-0.5 eV appears only in **dependent** claims 4, 10 and 13. The Examiner allowed the ’138 Patent because the Examiner found the subject matter in the independent claims to be patentable over the prior art. EX1012, 311-312 (Examiner’s statement of reasons for the indication of allowable subject matter: “the prior art of record does not teach or suggest the combination of . . . [a] value of x in MgO_x for the MgO layer is greater than 0 and

less than 1 in claims 13, 21, and 24;”); *Id.*, 330-335 (subsequent applicant amendment to amend independent claims 1, 15 and 24 to include all of the limitations of allowable claims 13, 21, 24, respectively); *Id.*, 342 (Notice of Allowability after the afore-mentioned amendment). The examiner manifestly did not believe “that a critical limitation distinguishing the prior art was MgO barrier height in the range of 0.2 to 0.5 eV” because that limitation does not even appear in any independent claim in the ’138 Patent.

IV. CONCLUSION

For the numerous independent reasons detailed above, this IPR should be discretionarily denied.

Respectfully submitted,
GODO KAISHA IP BRIDGE I

Date: June 16, 2025

/Gerald B. Hrycyszyn/
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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, the undersigned certifies that the foregoing **PATENT OWNER'S REQUEST TO THE DIRECTOR FOR DISCRETIONARY DENIAL OF INSTITUTION** contains 13,900 words excluding; a table of contents, a table of authorities, a certificate of service or word count, or appendix of exhibits or claim listing. Patent Owner has relied on the word count feature of the word processing system used to create this paper in making this certification.

Date: June 16, 2025

/Dara Del Rosario/
Dara Del Rosario
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CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (e)(4)

I certify that on June 16, 2025, a copy of the foregoing document, including any exhibits filed therewith, is being served via electronic mail, as previously consented to by Petitioner, upon the following:

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