

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RESONAC HARD DISK CORPORATION and
RESONAC CORPORATION,
Petitioners,

v.

MR TECHNOLOGIES GMBH,
Patent Owner.

Case No. IPR2026-00016
U.S. Patent No. 12,020,734

PATENT OWNER'S PRELIMINARY RESPONSE

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Rules

Rule 104(b)(4) 15, 20

PATENT OWNER’S EXHIBIT LIST

No.	Description
2010	Excerpts from <i>MR Technologies GmbH v. Western Digital Technologies, Inc.</i> , No. 22-cv-01599, Trial Tr. Day 3 (Volume 1)
2011	Declaration of Mark Re in Support of MR Tech’s Opposition to WD’s Motion for Summary Judgment of Invalidity, <i>MR Technologies GmbH v. Western Digital Technologies, Inc.</i> , No. 22-cv-01599, Dkt. 270-33 (filed February 26, 2024)
2012	Complaint, <i>MR Technologies GmbH v. Toshiba America Electronic Components, Inc. et al.</i> , No. 25-cv-00786, Dkt. 1 (C.D. Cal. Apr. 15, 2025)
2013	Excerpts from <i>MR Technologies GmbH v. Western Digital Technologies, Inc.</i> , No. 22-cv-01599, Trial Tr. Day 6
2014	Joint Exhibit 2030 Western Digital’s Recent Developments in Magnetic Recording Media presentation by Kumar Srinivasan dated April 6, 2018
2015	Joint Exhibit 2057 Western Digital’s Recent Developments in Magnetic Recording Media presentation by Kumar Srinivasan dated March 19, 2019
2016	Excerpts from <i>MR Technologies GmbH v. Western Digital Technologies, Inc.</i> , No. 22-cv-01599, Trial Tr. Day 3 (Volume 2)
2017	Excerpts from <i>MR Technologies GmbH v. Western Digital Technologies, Inc.</i> , No. 22-cv-01599, Trial Tr. Day 5 (Volume 1)
2018	C. Papusoi et al., Measurements of Gilbert Damping Parameter α for CoPt-Based and CoFe-Based Films for Magnetic Recording Applications, 51 J. Phys. D: Appl. Phys. 325002 (2018)
2019	Excerpts from <i>MR Technologies GmbH v. Western Digital Technologies, Inc.</i> , No. 22-cv-01599, Trial Tr. Day 7 (Volume 2)
2020	Defendants’ Notice of Motion, Motion to Stay, and Memorandum in Support Thereof in <i>MR Technologies GmbH v. Toshiba America Electronic Components, Inc. et al.</i> , No. 25-cv-00786, Dkt. 31 (C.D. Cal. Oct. 31, 2025)
2021	Complaint, <i>Resonac Hard Disk Corporation and Resonac Am., Inc.</i> , No. 25-cv-8631, Dkt. 1 (N.D. Cal. Oct. 9, 2025)

No.	Description
2022	U.S. 7,550,210 (Berger)
2023	Excerpts from <i>MR Technologies GmbH v. Western Digital Technologies, Inc.</i> , No. 22-cv-01599, Trial Tr. Day 7 (Volume 1)

I. INTRODUCTION

Resonac Hard Disk Corporation and Resonac Corporation (“Resonac” or “Petitioner”) has failed to carry its burden to show a reasonable likelihood that at least one of the challenged claims is unpatentable. The Petition’s only challenge to the ’734 Patent’s sole independent claim appears in Ground 1, which asserts obviousness over Takenoiri. But Takenoiri nowhere discloses the trilayer structure having the anisotropy grading Petitioner needs to supply the claim elements. And so Petitioner uses hindsight to assert that a POSITA would have devised this undisclosed structure, even though the undisputed objective evidence shows the claimed invention defied conventional wisdom, produced unexpected results, and earned widespread praise and commercial success.

The Petition’s obviousness theory fails for three independent reasons. *First*, it violates Rule 42.104(b)(4) which prohibits the use of expert testimony to supply a missing claim limitation. The Petition admits Takenoiri “does not explicitly state where a third magnetic recording layer would be positioned” or what magnetic properties it (or the other two layers) would have. Petitioner thus relies on its expert rather than disclosures in the prior art to supply the missing claim limitations, in violation of the rule. Institution should be denied on this basis alone.

Second, Petitioner’s obviousness theory is pure hindsight because it assumes a POSITA would have disregarded conventional wisdom and selected the very

configuration that only the invention's breakthrough made apparent. Because Takenoiri does not disclose a trilayer structure having the claimed configuration, Petitioner asserts that a POSITA would have been motivated to pursue it. But Petitioner offers nothing other than its expert's say-so to suggest a POSITA would have believed such a counterintuitive approach could achieve the alleged benefits. To the contrary, Li—the very reference Petitioner concedes a POSITA would look to for guidance—confirms that conventional wisdom would have led the POSITA down a different path.

Third, even if the Petition had done enough to establish a prima facie theory of obviousness, Petitioner's failure to address known secondary considerations of non-obviousness, including evidence directly undercutting its obviousness theory, warrants denial. Petitioner was well aware of extensive evidence in related litigation showing the invention was not obvious, including industry praise, unexpected results, and widespread industry adoption. The Board has repeatedly emphasized that a petition must substantively address evidence of secondary considerations of non-obviousness that the petitioner is aware of, and that failure to do so can warrant denial of institution. Petitioner's decision to completely ignore such evidence renders its obviousness challenge insufficient for institution.

Petitioner's request for institution should be denied.

II. BACKGROUND

A. The Invention

The '734 patent describes and claims magnetic recording media used in hard disk drives that transcended prior art attempts to overcome the “super paramagnetic limit” which restricted the amount of data that could be stored in existing media. Ex. 2010 (Day 3) at 25:1-26:5, 31:6-16. The invention uses a multilayered nucleation host formed on a hard storage layer. The nucleation host has two or more ferromagnetic layers with increasing anisotropy (the resistance to changes in magnetization away from an easy axis) layer to layer toward the hard storage layer. *Id.* 31:17-33:9.

The invention went against the conventional wisdom of minimizing the distance between the hard storage layer and the HDD's write head (which emits a write field that weakens as distance or number of layers increases). Ex. 2010 (Day 3) at 28:11-17; Ex. 2011 (Re Decl.) ¶ 102. It also achieved the unexpected results of decreasing the coercive field (making it easier to write to the hard storage layer) while maintaining thermal stability and enhancing the head field through the media despite the intervening softer layers (which were thought to degrade the head field). *Id.* 26:13-28:10. The undisputed fact that none of the asserted references discloses

this innovative media design demonstrates that others in the field, guided by conventional thinking, veered away from the unorthodox approach of the invention.¹

B. Known Evidence of Secondary Considerations of Non-Obviousness

There is exceptionally strong evidence in the public record of secondary considerations of non-obviousness for the '734 patent, all of which Petitioner was well aware of before filing its Petition. Both at the district court trial (discussed further in Section II.C below) and in its complaint against Toshiba (Ex. 2012, discussed further Section II.D below), Patent Owner presented evidence of industry praise, unexpected results, long-felt need, and commercial success.²

¹ A hard disk drive (HDD) has write heads on either side of each disk so that data can be written to both the top and bottom sides of the disk. For ease of reference, this POPR generally refers to the top side and its corresponding write head. Thus, unless otherwise indicated, the terms “upper,” “top,” “above,” and the like refer to features closer to the write head and farther from the substrate. And the terms “lower,” “bottom,” “below,” and the like refer to features farther from the write head and closer to the substrate.

² For purposes of this POPR, Patent Owner focuses only on evidence in the public record. Patent Owner reserves the right to rely on additional evidence of secondary considerations should this proceeding be instituted.

1. Industry Praise

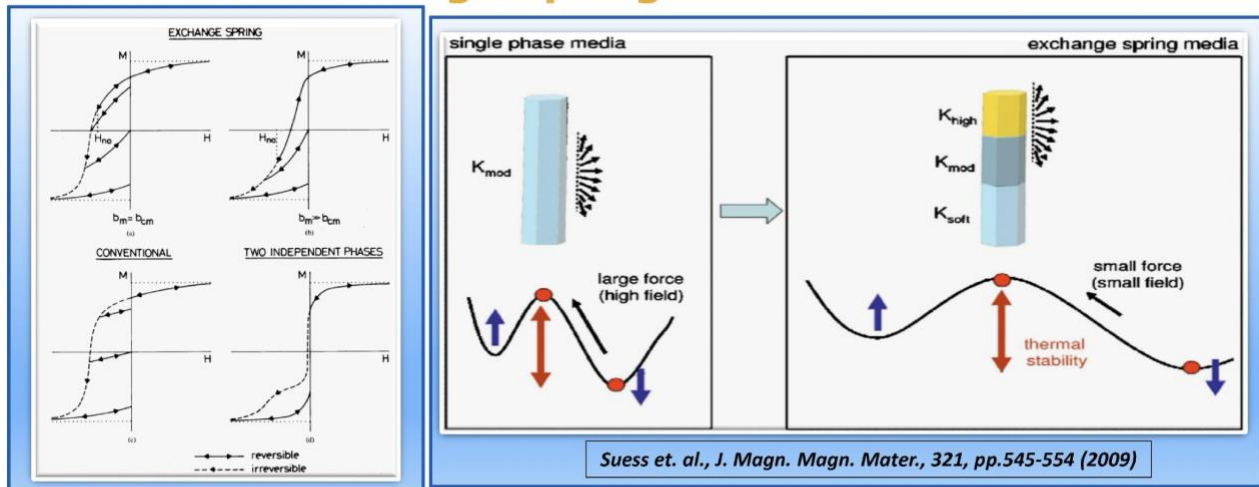
Dr. Randall Victora was the invalidity expert at the district court trial and has worked with and received funding from HDD market leaders Western Digital and Seagate since at least 2000. *See* Ex. 2013 (Day 6) 107:3-9; Ex. 2012 ¶ 14. In 2017, he submitted a letter to IEEE nominating Dr. Suess for the distinguished position of IEEE Fellow. *Id.* Dr. Victora recognized Dr. Suess as the inventor of the exchange spring media adopted by the HDD industry:

The general belief was that a high thermal stability goes along with a high coercivity. However, the new media demonstrated that the coercivity can be partially decoupled from thermal stability by the use of multiple magnetic layers with graded anisotropy. The concept of exchange spring media was patented by D. Suess in 2006. ***This new storage media was quickly applied by industry.*** Media based on the new concept was quickly adopted by industry: nowadays, ***almost all state of the art hard disks rely on this idea.*** The work on exchange spring media of D. Suess is cited over 800 times.

Ex. 2023 (Day 7) 112:1-113:8; Ex. 2012 ¶ 14. In the section identifying the three publications that most supported the nomination, Dr. Victora cited US 2010/0062286, a parent application which shares the same specification as the '734 patent. Ex. 2023 (Day 7) 114:14-22.

In an April 2018 IEEE Magnetics Society presentation titled “Recent developments in magnetic recording media” (“Srinivasan: Magnetic Recording Media”), Western Digital’s Director of Materials Engineering Dr. Kumar Srinivasan also credited Dr. Suess’s invention as the solution to the superparamagnetic limit trilemma:

Enter the “exchange-spring”



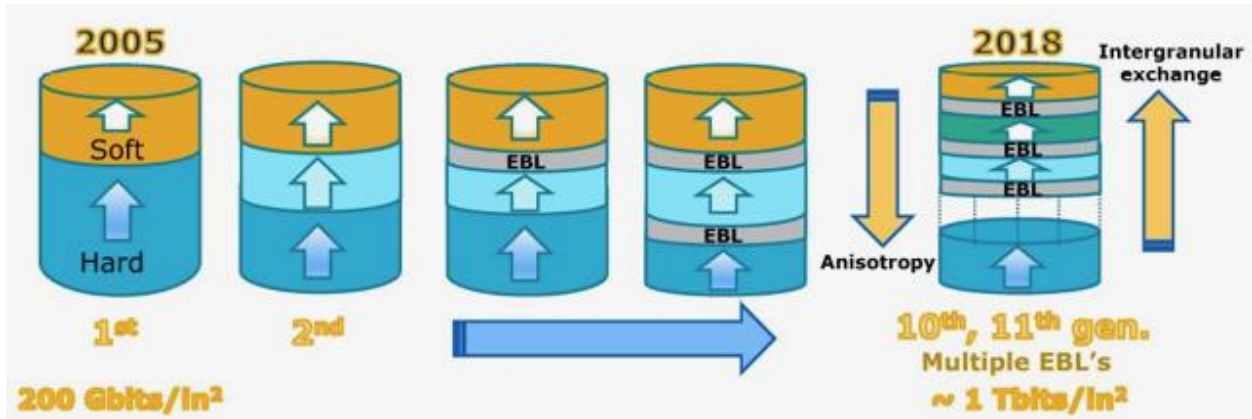
“The Exchange-Spring Magnet: A New Material Principle for Permanent Magnets”,
IEEE Trans. Magn., 27, pp.3588 (1991)

**Keep the same energy barrier (thermal stability)
but change the required force (field)!**

Ex. 2014 at 9; Ex. 2016 (Day 3) at 30:2-31:9 (explaining that the figure on the right shows “a graded anisotropy structure going from soft to moderate to high” with the hard storage layer being nearest the substrate and the nucleation host comprising the moderate and soft layers); Ex. 2012 ¶ 15.

Dr. Srinivasan also showed how Dr. Suess’s invention unlocked the path for increasing areal densities from about 200 Gb/in² to upwards of 1 Tb/in²— and like

Dr. Victora, he acknowledged that Dr. Suess's invention "has guided most of the advances in PMR media since inception":



- PMR is the prevailing magnetic storage technology
 - Grain size scaling does not benefit PMR (exchange-dominated)
 - The "exchange-spring" principle in ECC media has guided most of the advances in PMR media since inception

The diagram shows a vertical stack of three layers: a top yellow layer labeled K_{high} , a middle grey layer labeled K_{mod} , and a bottom blue layer labeled K_{soft} . A fan of arrows points to the right from the K_{mod} layer.

Ex. 2015 at 14, 44; Ex. 2016 (Day 3) at 31:10-25.

Dr. Mark Re—Seagate's Senior VP of R&D from 2003-2009, Senior VP of Recording Media from 2009-2013, and CTO from 2013 to 2018—also testified that "Dr. Seuss' two patents in this case are the foundation on which modern PMR media is built," consistent with Dr. Victora's recognition that "almost all state of the art hard disks rely on [Dr. Suess's] idea." Ex. 2016 (Day 3, Vol. 2) at 129:12-14; Ex. 2012 ¶ 14.

2. Unexpected Results

A multilayer nucleation host with increasing anisotropy toward an underlying hard storage layer was contrary to convention wisdom at the time. Because the write

field decreases as the distance from the write head increases, conventional wisdom was to put the hardest layer with the highest anisotropy closest to the write head. Dr. Suess's invention shattered the conventional thinking, putting the hard storage layer on the bottom, farthest from the write head, and interposing a plurality of ferromagnetic layers between the write head and the hard storage layer with the anisotropy of a ferromagnetic layer that is closer to the hard storage layer being higher than the anisotropy of a ferromagnetic layer that is farther away from the hard storage layer. In part, that is because the hard storage layer of the claimed invention is toward the bottom of the stack, near the substrate, and farthest away from the write head. Ex. 2012 ¶ 13.

In a 2017 IEEE Fellow nomination letter, Dr. Victora credited Dr. Suess as the inventor of the exchange spring media adopted by the HDD industry and explained that the invention broke with the prevailing belief that higher thermal stability necessarily required higher coercivity, demonstrating instead that coercivity could be partially decoupled from thermal stability through multiple magnetic layers with graded anisotropy—the patented exchange-spring approach. Ex. 2023 (Day 7) 112:1-113:8; Ex. 2012 ¶ 14.

Dr. Re first heard of the invention at a 2006 industry conference. His reaction was “I thought it was crazy and that this is never going to work.” Ex. 2010 (Trial Day 3) 26:6-28:10. He explained that not only was he skeptical that the invention

could separate thermal stability from coercivity but that he expected it to degrade signal-to-noise ratio (SNR) because “usually when you have a softer layer on top, it will tend to spread the field, which is not what you want to do.” *Id.* at 26:13-28:10. Distancing the hard storage layer from the write head by inserting a multilayer nucleation host between them was also thought to degrade performance. *Id.* at 28:11-17 (“So the industry spends a lot of time trying to get the head very close to the disk, the media surface. And putting the hard storage layer far away where the write field would be decreasing, again, made no sense at all.”).

Dr. Re and his team’s skepticism gave way only after they ran experiments confirming that not only did the invention work but that it unlocked a path to increasing areal density. Ex. 2010 (Trial Day 3) 29:4-7 (“Knowing that I can be wrong, we did test this, and we found to our surprise that it did work and saw that it could have a path forward, like a roadmap, to keep increasing areal density.”), 32:8-14 (the invention “broke the superparamagnetic limit, which many researchers in the field have been trying to figure out, but it was just assumed that this was not separatable, the stability from the [writ]ability. But Dr. Seuss’ invention -- again, to my surprise -- showed a way to do that.”)

3. Commercial Success

The public evidence of commercial success includes Dr. Victora’s IEEE letter discussed above where he acknowledged that Dr. Seuss’s invention “was quickly

applied by industry” and that “almost all state of the art hard disks rely on this idea.” Ex. 2012 ¶ 14. In addition, Dr. Peter Goglia—Executive Director at Seagate until 2004, VP of R&D at Western Digital until 2007, and President of VeriTekk Solutions (a consulting firm serving the HDD industry) since 2012 where he has studied “technology trends and impact on areal density, technology transitions, areal density growth” (see veritekk.com/about)—testified that “[b]y the end of 2007, the average areal density industry-wide was approximately 240 gigabits per square inch.” Ex. 2017 (Day 5) at 51:11-14. He then testified that “it was shortly after this that *the industry widely adopted the alleged infringing technology of multilayer media with varying anisotropy and layers.*” *Id.* 52:20-53:10. He testified that in fact, Western Digital would not be able to compete in the market without Dr. Sues’s patented technology. *Id.* at 54:11-20 (“A. If Western Digital was not able to use multilayer media with varying anisotropy in the layers, would it be able to compete in terms of areal density in the market? Q. Not likely. I don’t know if there’s any other solutions out there, but *that’s the commonly accepted solution.*”); *see also* Ex. 2012 ¶ 20.

A 2018 industry journal article states: “Current PMR media have an ECC structure consisting of several magnetic layers having a vertically graded anisotropy which enables the reduction of H_{sw} via an exchange spring effect” and “is expected to remain one of the key features of future PMR media.” Ex. 2018 (C. Papusoi et

al., Measurements of Gilbert Damping Parameter α for CoPt-Based and CoFe-Based Films for Magnetic Recording Applications, 51 J. Phys. D: Appl. Phys. 325002 (2018)).

Dr. Re confirmed that, like Western Digital, Seagate also adopted Dr. Suess's invention. Ex. 2016 (Day 3, Vol. 2) 127:19-21 ("Seagate uses Dr. Seuss' inventions in the patents in this case."); Ex. 2019 (Day 7, Vol. 2) 76:18-19 ("Seagate followed the path that Dr. Seuss put forward in his invention."). Dr. Re also testified that "Dr. Seuss' two patents in this case are the foundation on which modern PMR media is built," consistent with Dr. Victora's recognition that "almost all state of the art hard disks rely on [Dr. Suess's] idea" and Dr. Srinivisan's acknowledgment that Dr. Suess's invention "has guided most of the advances in PMR media since inception." See Ex. 2016 (Day 3) at 32:15-17; Ex. 2012 ¶ 19.

C. The District Court Trial

In August 2022, MR Tech asserted U.S. Patent Nos. 9,928,864 ("'864 patent") and 11,138,997 ("'997 patent") against Western Digital Technologies, Inc. ("Western Digital") in MR Techs. GmbH v. Western Digital Techs., Inc., No. 8:22-cv-01599 (C.D. Cal.). The '734 patent is a continuation of the '997 patent which is a continuation of the '864 patent. All three patents share the same specification.

The accused products included all of WD's hard disk drives (HDDs) sold in the U.S. since March 27, 2018, the issue date of the '864 Patent. On July 26, 2024,

after an eight-day trial, the jury returned its verdict, finding both patents infringed and not invalid, and awarding \$262,388,800 in damages to MR Tech.

The '734 patent, was asserted against Western Digital in case No. 24-cv-01848 (C.D. Cal. Aug. 22, 2024), and the case settled on May 16, 2025. The only independent claim in the '734 patent is narrower in scope than the independent claims of the '864 and '997 patents upheld by the jury. For instance, claim 1 of the '734 patent recites a substantially similar magnetic recording system as claim 1 of the '997 patent except for an additional limitation requiring that at least two ferromagnetic layers are exchange coupled with an exchange coupling layer. *See* Ex. 2009 at 1. Claim 1 of the '734 patent is even narrower than that of the '864 patent. *See id.* at 2.

D. The Toshiba Case and Petitioner's Responsive DJ Action

In April 2025, MRT asserted the '864, '997, and '734 patents against Toshiba America Electronic Components, Inc. ("TAEC") and Toshiba Electronic Devices and Storage Corporation ("TDSC") (collectively, "Toshiba") in *MR Technologies GMBH v. Toshiba America Electronic Components, Inc.*, No. 25-cv-00786-JVS-DFM (C.D. Cal. Apr. 15, 2025). Ex. 2012.

In October 2025, after filing its answer to MRT's complaint, Toshiba filed an opposed motion to stay pending resolution of the present declaratory judgment action. In the motion, Toshiba represents that "Toshiba has a contractual right to

indemnification from Resonac in this circumstance, and Resonac has agreed to indemnify Toshiba in accordance with the terms of the parties' agreement." Ex. 2020 at 6.

Also in October 2025, Resonac filed an action for declaratory relief in the Northern District of California. Resonac alleges that it supplies "most (if not all) of the magnetic recording media for [Toshiba's accused] HDD products." Ex. 2021 ¶¶ 26-27. Resonac seeks a declaration of non-infringement, alleging that its media does not meet the limitation "nucleation host ... comprises ferromagnetic layers with increasing anisotropy constant K from layer to layer." *Id.* ¶¶ 32, 37.

III. CLAIM CONSTRUCTION

After full briefing and expert testimony, the district court construed the key terms of the '864 and '997 patents. Ex. 1019 (CC Order). As discussed above, the claims of the '734 patent contain many of the same terms. *See* Ex. 2009 at 1. Although not binding on the Board, the court's constructions are highly persuasive and should guide the Board's analysis. Indeed, the Petition repeatedly applies the district court's claim constructions. *See, e.g.*, Petition at 15 n.6 (applying district court's construction of "underlayer"), 20 n.7 (applying court's construction of "hard magnetic storage layer"), 26 (applying court's construction of "nucleation host"), 39 (same for "nucleation host ... comprises ferromagnetic layers with increasing anisotropy constant K from layer to layer"), 40-41 ("nucleation host").

IV. OVERVIEW OF TAKENOIRI

Takenoiri discloses a “perpendicular magnetic recording medium [that] has a first magnetic recording layer and a second magnetic recording layer between [which] is interposed a coupling layer that ferromagnetically couples the two layers.” Takenoiri, Abstract; Petition at 11.

All of Takenoiri’s figures and working examples pertain to bilayer structures. *See* Petition at 27 (“Takenoiri’s Figures 1 and 4, as well as Examples 1-6, concern bi-layer structures”).

Petitioner’s expert provides a summary discussion of each Example. Ex. 1003 ¶ 122 (Example 1), ¶ 124 (Example 2), ¶ 125 (Examples 3-6). Takenoiri provides detailed test data for each bilayer structure as compared to a single layer structure but does not provide any data for a trilayer structure. *See id.*

Before its discussion of Examples 1-6, in the context of listing potential alternatives for each component of the media, Takenoiri generically states that the magnetic recording layers “can be constructed with three or more layers” and that such a structure could “still produce[] the effect of improving thermal stability and the effect of reducing switching field at the same time.” Ex. 1005, 10:7-18. This three-sentence passage is the sole discussion in Takenoiri of a trilayer structure. It does not disclose any magnetic properties (e.g., K_u or H_c), thickness, composition, or any other parameters of any layer in such trilayer structure. *See id.*; Petition at 12

(“Takenoiri does not explicitly state where a third magnetic recording layer would be positioned.”).

V. THE PETITION’S GROUND 1 FAILS³

Ground 1 is the only challenge to claim 1, the sole independent claim of the ’864 patent. Because Ground 1 fails for the reasons below, the Petition cannot show a reasonable likelihood that at least one of the challenged claims is unpatentable. Institution should thus be denied.

A. The Petition Violates Rule 42.104(b)(4) by Using General Knowledge to Supply Missing Claim Limitations

The Petition should be denied for failing to specify that each element of the claim “is found in the prior art patents or printed publications” under Rule 104(b)(4). July 31, 2025 Memorandum on Enforcement and Non-Waiver of 37 C.F.R. § 42.104(b)(4) and Permissible Uses of General Knowledge in Inter Partes Reviews (“July 31 Memo”).⁴ Instead, the Petition relies on general knowledge to supply missing claim limitations. Such reliance was explicitly prohibited by the PTO in the

³ While Patent Owner only addresses certain claim limitations in this preliminary response, it reserves the right to address additional issues in a Patent Owner Response should a proceeding be instituted on the Petition.

⁴ The July 31 Memo applies “to any petition for IPR filed on or after September 1, 2025,” including this Petition that was filed on October 8, 2025.

July 31 Memo, which states that “general knowledge” such as “expert testimony, common sense, and other evidence that is not ‘prior art consisting of patents or printed publications’” may not be used to “supply a missing claim limitation.” July 31 Memo at 1; *see also Shenzhen Root Technology Co., Ltd. v. Chiaro Technology Ltd.*, IPR2025-00554, Paper 10 (PTAB Oct. 14, 2025) (“As a practical matter, this means that applicant admitted prior art, expert testimony, common sense, and other evidence that is not ‘prior art consisting of patents or printed publications’ may not be used to supply a missing claim limitation.”). The USPTO “will enforce and no longer waive” this rule under Rule 104(b)(4). *Id.* The Board “shall deny an IPR petition that fails to comply with Rule 104(b)(4).” *Id.*

Petitioner relies on a single reference, Takenoiri, as allegedly rendering obvious the '734 patent's only independent claim. Petitioner's obviousness theory starts with Takenoiri's two-layer exchange-coupled recording stack (first recording layer 5 / coupling layer / second recording layer 7) and then “extends” it to a graded-anisotropy trilayer by adding a third magnetic recording layer. *See* Petition 33-35. Because Takenoiri does not actually disclose where any third layer would go, Petitioner—through its expert—asserts a POSITA would place the third layer above Takenoiri's second layer 7 (i.e., farthest from the substrate) and would include an additional coupling layer so the three magnetic layers remain exchange-coupled. *See* Petition 13, n. 4. Petitioner further contends a POSITA would configure the trilayer

to “continue” Takenoiri’s described reversal sequence and reduce switching field by making the added third layer the softest layer—i.e., assigning it lower anisotropy (Ku_3) than Ku_2 and lower coercivity (Hc_3) than Hc_2 (and Hc_1)—so that magnetization reversal initiates in the third layer, then proceeds to the second layer, and finally to the first layer, thereby lowering the structure’s effective switching field (and purportedly allowing thermal stability to be maintained or improved by increasing the bottom layer’s coercivity). *See* Petition 33-35.

But Petitioner does not (and cannot) demonstrate that each and every limitation is present in the Takenoiri reference. For example, Petitioner states that Takenoiri “renders obvious” limitations 1[H] and 1[K] on the “nucleation host.” Petition at 35-36, 46-47. In other words, by Petitioner’s own admission, Takenoiri does not disclose or teach at least limitations 1[H] and 1[K] of independent claim 1.

Limitation 1[H] is to “a nucleation host, having a second coercive field H_n without the hard magnetic storage layer, lower than the first coercive field, $H_n < H_s$.” Petitioner spends five pages discussing why this limitation would be obvious based on a modification of Takenoiri’s teachings. Petition at 32-36. Petitioner does not contend that Takenoiri itself teaches this limitation, and as explained below in Section B, Petitioner cannot even assert obviousness without relying on hindsight. Rather, Petitioner relies on expert testimony to supply the limitation that is missing from Takenoiri. Even though Takenoiri does not disclose a nucleation host with the

claimed layers with lower coercive fields, Petitioner states that “a POSITA would have been motivated” to meet this limitation based on Takenoiri’s teaching directed to a “first magnetic recording layer” (which Petitioner alleges is the “hard magnetic storage layer”) and the “second magnetic recording layer” (which Petitioner alleges is one layer of the nucleation host). *See* Petition at 34-35; *see also* Ex. 1003 (Zhu) at ¶ 166 (“a POSITA would have been motivated to set H_{c3} lower than H_{1+2} to maintain the overall coercivity (H_{c1+2+3}) as compared to a bi-layer structure, because as Takenoiri teaches with its bi-layer structures, introducing a ‘softer’ layer with coercivity lowers (H_{c2}) than the existing structure reduces the overall coercivity (H_{c1+2}).”). Petitioner’s use of expert testimony to fill the gaps in the Takenoiri reference is in direct violation of the July 31 Memo.

Limitation 1[K] requires the “nucleation host” to “comprises at least a first ferromagnetic layer with an anisotropy constant $K1$ and a second ferromagnetic layer between the first ferromagnetic layer and the hard magnetic storage layer with an increased anisotropy constant $K2$ greater than $K1$.” Petition at 39-47. As with limitation 1[H], Petitioner again fails to comply with the July 31 Memo by spending eight pages on why “Takenoiri renders obvious” this limitation based on modifications to Takenoiri’s teachings. Petitioner first discusses why a “POSITA would have found it obvious” based on Takenoiri to have multiple layers in the claimed “nucleation host.” Petition at 39-42. But as Petitioner admits, Takenoiri does

not disclose multiple layers in a “nucleation host.” *See* Petition at 13 n.4 (conceding that “Takenoiri *does not* explicitly state where a third magnetic recording layer would be positioned” and arguing only that a POSITA would have found it obvious to “add additional layer(s) above the second magnetic recording layer 7.”) (emphasis added). And as shown in Section B below, a POSITA would not have pursued Petitioner’s proposed modification.

Petitioner next discusses why a “POSITA would have found it obvious to configure Takenoiri’s ‘nucleation host’” to meet the anisotropy constants limitation. Here again, Petitioner relies on expert testimony to supply this limitation that is missing from Takenoiri. Takenoiri does not disclose a nucleation host with the claimed anisotropy constants. Instead, Petitioner relies on examples from Takenoiri for the “first magnetic recording layer” (which Petitioner alleges is the “hard magnetic storage layer”) and the “second magnetic recording layer” (which Petitioner alleges is one layer of the nucleation host). *See* Petition at 42-46. Petitioner’s “reasons” that this limitation is met are all based on hindsight-driven modifications to Takenoiri. *See, e.g.*, Petition at 43 (for the first reason, “it would have been obvious to a POSITA”); at 44 (for the second reason, “a POSITA would have been motivated to try”); at 44 (for the third reason, “a POSITA would have been motivated”); at 45 (for the fourth reason, “a POSITA would have been motivated to set”); at 45 (for the fifth reason, “a POSITA would have had reasonable

expectation of success”). Petitioner therefore fails to meet the requirement under Rule 104(b)(4) as set forth in the July 31 Memo by attempting to use “general knowledge” to supply missing limitations in Takenoiri. Because Petitioner fails to comply, its petition must be denied. July 31 Memo at 1.

To the extent Petitioner argues its expert testimony “demonstrate[s] how a skilled artisan would have understood a prior art reference’s disclosure as teaching a claim limitation,” July 31 Memo at 2, this does not give an expert carte blanche to explain why a POSA would have been motivated to modify the prior art to add a claim limitation that was missing from the art. Petitioner cannot, as it does here, use expert testimony to supply a limitation that is missing altogether from Takenoiri.

Accordingly, Petitioner’s challenge to claim 1 fails.

B. The Petition’s Modification of Takenoiri Relies on Hindsight

Takenoiri nowhere discloses a trilayer structure of the type Petitioner hypothesizes—i.e., a bottom layer having the highest K_u and H_c , a middle layer above it having lower K_u and H_c , and a top layer above that having the lowest K_u and H_c , such that anisotropy and coercivity increase from top to bottom. As discussed above, Petitioner relies on this undisclosed structure to assert that Takenoiri renders obvious Limitations 1[H] and 1[K]. But as shown below, the Petition’s alleged motivation for pursuing such a structure depends on imputing knowledge to a POSITA that comes only from the claimed invention. Because that

is hindsight-driven reasoning, Petitioner cannot rely on its proposed trilayer as the basis for obviousness and so Ground 1 fails to establish a reasonable likelihood that Claim 1 is unpatentable. *See Solus Advanced Materials Co., Ltd. v. SK nexilis Co., Ltd.*, PTAB-IPR2024-01462, Paper 14 (PTAB Apr. 25, 2025) (improper to “imbue one of ordinary skill in the art with the knowledge of the claimed invention, when no prior art reference, references of record, or other evidence conveys or suggests that knowledge.”); *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (fact finder must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning”).

To arrive at its proposed trilayer structure, Petitioner incorrectly assumes that a POSITA would start with one of the specific bilayers from Examples 1–6, put a third magnetic layer on top, and set that layer’s coercivity to be the lowest in the stack. But there is a reason neither Takenoiri nor any other prior art reference discloses Petitioner’s proposed trilayer: A POSITA, guided by conventional wisdom, would have put the hardest (highest K_u/H_c) and most difficult to switch layer on top (closest to the write head where the write field is strongest), rather than further separate that layer from the write head by inserting another magnetic recording layer and another coupling layer above it. *See Ex. 2011 (Re Decl.)* ¶ 102 (“Adding a layer [on top] would not only increase the distance but would increase the amount of ferromagnetic material between the write head and the hard storage

layer, further weakening and reducing the sharpness of the head field.”); Ex. 2010 (Trial Day 3) 26:6-28:10 (explaining that the addition of a softer layer on top was expected to degrade signal-to-noise ratio (SNR) without improving writability while maintaining thermal stability), 28:11-17 (“So the industry spends a lot of time trying to get the head very close to the disk, the media surface. And putting the hard storage layer far away where the write field would be decreasing, again, made no sense at all.”); Ex. 2011 (Re Decl.) ¶ 92 (“Because softer layers were thought to have more intergranular exchange, a POSITA would have expected the softer layers to reduce head field sharpness, resulting in grains adjacent to the ones being written being more susceptible to being flipped inadvertently.”).

This conventional wisdom is confirmed by Li, a Seagate patent filed in September 2005, after Takenoiri. Notably, given Takenoiri’s lack of detail regarding the trilayer embodiment, Petitioner itself asserts that a POSITA implementing Takenoiri would have looked to Li for guidance. *See, e.g.*, Petition at 35 n. 12 (“A POSITA would have been motivated by ... Li to implement a coercivity gradient ($H_{c3} < H_{c2} < H_{c1}$) in Takenoiri’s tri-layer structure, with a reasonable expectation of success.”); *see also* Petitioner’s petition challenging the related ’864 patent in IPR2026-00014, Paper 2, at 71 (“A POSITA designing Takenoiri’s tri-layer structure looking to preserve the same or similar productivity and recording density would have been motivated to look to analogous references, including Li”),

73 (“[A] POSITA would have understood that Li’s single recording layer [comprising multiple sub-layers] corresponds to Takenoiri’s stack of magnetic recording layers and each of Li’s sub-layers corresponds to each of Takenoiri’s magnetic recording layers.”).⁵

Li describes the use of multiple magnetic recording layers (which Li refers to as “sub-layers”) in perpendicular recording media. Ex. 1022 at 11:38-40. Consistent with conventional wisdom, Li positions the highest Hk layer (M1) on top, nearest the write head above (not shown) with the underlying layers (M2, M3, M4) having decreasing Hk values— $Hk1 > Hk2 > Hk3 > Hk4$.

⁵ The Petition also cites Osato (Ex. 1016) to show motivation for a coercivity gradient. But Osato concerns optical memory which operates fundamentally differently from perpendicular magnetic recording media and is directed to an entirely different problem unique to optical memory, namely the need to erase before recording. Ex. 1016, 1:15-37. And Osato’s layers are laminated with no coupling layer which Takenoiri discloses would not work. *Id.* 2:24-39; Ex. 1005, 7:27-45 (“If the two magnetic recording layers are laminated without a coupling layer, the two layers reverse each magnetization at the same time, failing to provide the function that the thermal stability is improved and simultaneously the switching field is reduced by individually reversing the magnetization.”).

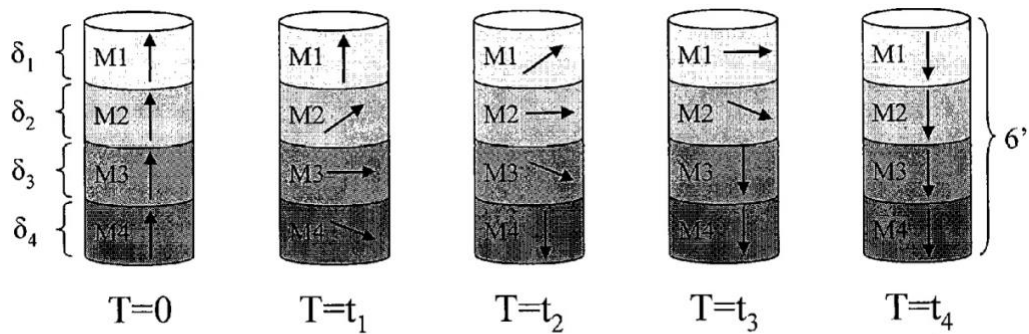
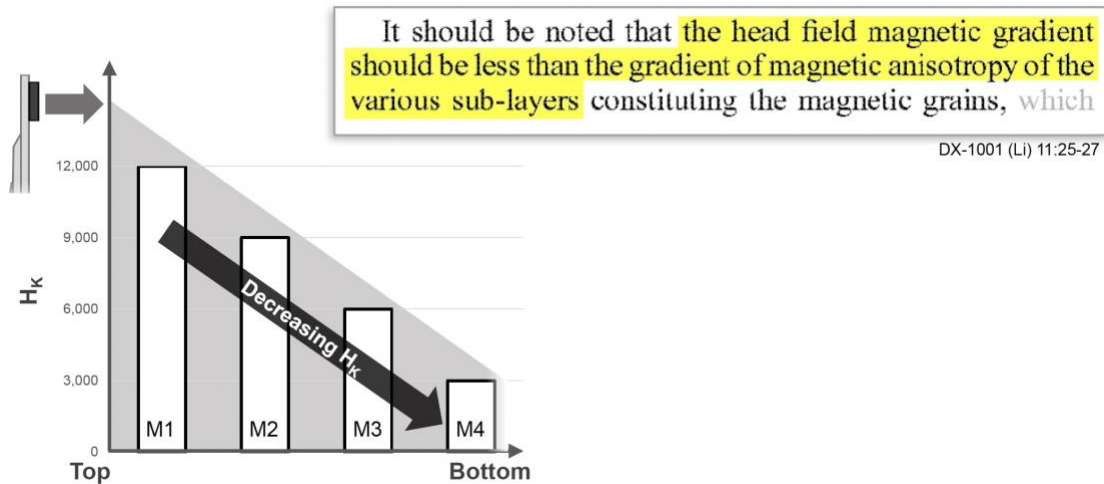


FIG. 3

Ex. 1022 (Li) Fig. 3, 9:24-38; Ex. 2011 ¶ 48. Thus, as the Petition acknowledges, Li discloses a coercivity gradient across the layers. *See* Petition at 35 n. 12.

The write head above the stack writes to the hard storage layer (M1) by generating a write field (or “head field”). The strength of the head field decreases away from the write head and toward the bottom of the stack. The decreasing strength of the head field is called the head field gradient. Li teaches that the head field gradient “should be less than the gradient of magnetic anisotropy of the various sub-layers constituting the magnetic grains.” Ex. 1022 (Li) 11:25-31. This is shown in the figure below where the head field gradient (grey) is less than the Hk gradient (slope of white bars).

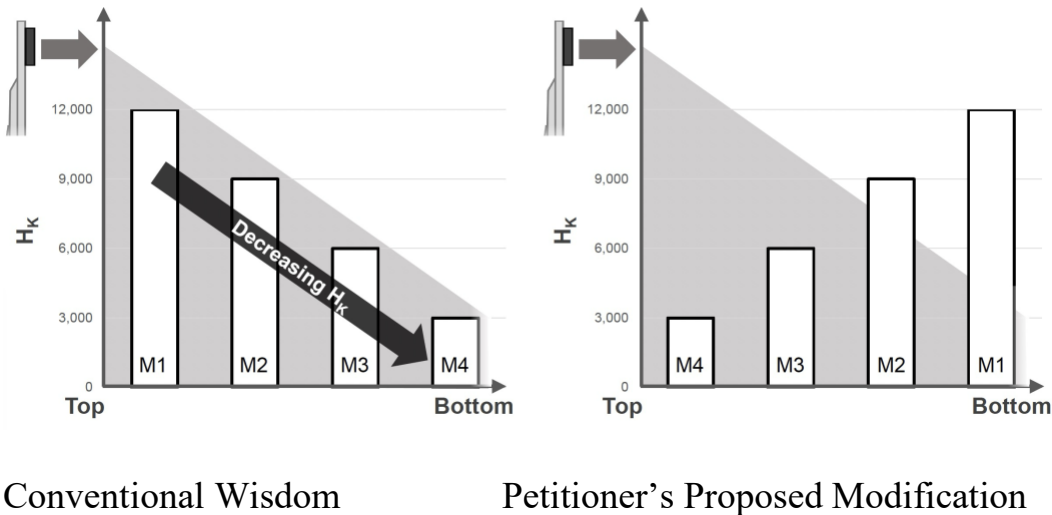


Li follows the conventional approach of positioning the hard storage layer so it is closest to the write head. Inserting layers between the write head and the hard storage layer was thought to not only weaken but disperse and reduce the sharpness of the write field such that it could flip neighboring grains. Ex. 2011 (Re Decl.) ¶¶ 43, 48, 105; Ex. 2022 (US 7,550,210 (Berger)) 3:3-6 (“[A] write head produces a larger magnetic field and larger field gradient near the surface of the [recording layer (RL)], while the field strength decreases further inside the RL.”), 8:55-59. Li concludes that, consistent with conventional wisdom, its approach achieves the “maximum gain in SNR, thermal stability, and writability.” Ex. 1022 (Li) 12:66-13:3; Ex. 2011 (Re Decl.) ¶¶ 54-55.

Thus, even if a POSITA implementing Takenoiri would have been motivated to attempt Petitioner’s graded anisotropy trilayer, the POSITA would have done so in accordance with conventional wisdom as taught by Li. See Petition at 35 n. 12 (“A POSITA would have been motivated by ... Li to implement a coercivity

gradient ($H_{c3} < H_{c2} < H_{c1}$) in Takenoiri's tri-layer structure"); *see also* Petitioner's petition v. '864 patent in IPR2026-00014, Paper 2, at 73 ("[A] POSITA would have understood that Li's single recording layer [comprising multiple sub-layers] corresponds to Takenoiri's stack of magnetic recording layers and each of Li's sub-layers corresponds to each of Takenoiri's magnetic recording layers.").

In short, Petitioner's hypothetical trilayer rests on the flawed and unsupported premise that a POSITA would defy conventional wisdom and assume that the hardest-to-switch layer should be buried at the bottom, separated from the write head by two (or more) intervening softer layers, creating an anisotropy/coercivity gradient that runs opposite the write-field gradient:



Petitioner's theory should be rejected as rooted in hindsight.

C. The Petition Fails to Address Known Evidence of Secondary Considerations of Non-Obviousness

“[T]he PTAB has cautioned petitioners in prior proceedings that known evidence of secondary considerations should be addressed in the Petition.” *Aardevo North America, LLC v. Agventure BV*, PTAB-IPR2025-00136, Paper 9 at 32-35 (PTAB May 1, 2025). Indeed, evidence of secondary considerations “must always when present be considered en route to a determination of obviousness.” *In re Cyclobenzaprine Hydrochloride*, 676 F.3d 1063, 1075-76, 1079 (Fed. Cir. 2012); *see also Apple, Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (“A determination of whether a patent claim is invalid as obvious under § 103 requires a consideration of all four Graham factors, and it is error to reach a conclusion of obviousness until all those factors are considered.”). Because secondary considerations serve as a “check against hindsight bias,” they “may often be the most probative and cogent evidence in the record.” *In re Cyclobenzaprine Hydrochloride*, 676 F.3d at 1075-76; *see also Apple*, 839 F.3d at 1052-53 (“[E]vidence of secondary considerations ... may often establish that an invention appearing to have been obvious in light of the prior art was not.”); *see also Ex. 1003* at ¶ 79 (Petitioner’s expert acknowledging that a proper obviousness analysis considers “the existence of secondary considerations such as commercial success, long-felt but unresolved needs, failure of others, copying, industry praise, etc.”).

As discussed in Section II.B above, Patent Owner presented extensive evidence of secondary considerations of non-obviousness both at the district court trial and in its complaint against Toshiba, including industry praise, unexpected results, and commercial success. A presumption of nexus applies where, as here, “the product embodies the claimed features, and is coextensive with them.” *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018) (internal quotation omitted); *see also* *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330-31 (Fed. Cir. 2016) (“[T]he claimed combination as a whole [can] serve[] as a nexus for the objective evidence”); Section II.B above (discussing evidence coextensive with claimed invention); *see also* Section II.C above (explaining that ’734 claim 1 is substantially similar to ’997 claim 1 and citing Ex. 2009, a side-by-side comparison of these claims).

Petitioner was well aware of this evidence. Petitioner admits it has reviewed the trial record. *See* Petitioner’s petition challenging the related ’864 patent in IPR2026-00014, Paper 2, at 3-4 (discussing “district court testimony.”). Petitioner has also reviewed Patent Owner’s complaint against Toshiba (Ex. 2012) which, as discussed in Section II.D above, Petitioner has agreed to indemnify. *See, e.g.*, Ex. 2021 at ¶ 13 (discussing the Toshiba complaint), ¶¶ 22-26 (citing paragraphs in the complaint).

Despite its awareness of this evidence, Petitioner does not even mention secondary considerations in the Petition. This omission warrants denial of institution. *See Stryker Corp. v. KFx Medical, LLC*, IPR2019-00817, Paper 10 (PTAB Sept. 16, 2019) (“We have cautioned petitioners in prior proceedings that petitions may be denied if they do not address known evidence of secondary considerations.”); *see also Gilead Sciences, Inc. v. The United States of America*, IPR2019-01453, paper 14 at 27-29 (rejecting petitioner’s argument that it was not required to address known secondary indicia in its petition); *Robert Bosch Tool Corp. v. SD3 LLC*, IPR2016-01751 (PTAB Mar. 22, 2017) (Paper 15) (denying institution for failure to address objective indicia presented in ITC proceeding); *see also Coalition for Affordable Drugs V LLC v. Hoffman–LaRoche, Inc.*, IPR2015–01792 (PTAB Mar. 11, 2016) (Paper 14) (denying institution for failure to address objective indicia considered by Examiner during original prosecution).

VI. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that institution be denied.

Date: January 8, 2026

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CERTIFICATION REGARDING WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), Patent Owner certifies that there are 6,220 words in the paper excluding the portions exempted under 37 C.F.R. §42.24(a)(1).

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

The undersigned hereby certifies that the above document was served on January 8, 2026 by filing this document through the Patent Trial and Appeal Case Tracking System (PTACTS) as well as delivering a copy via electronic mail upon the following attorneys of record for Petitioner:

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