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Paper No. 14
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY, INC.,
Petitioner,

v.

YANGTZE MEMORY TECHNOLOGIES COMPANY, LTD.,
Patent Owner.

IPR2024-00793
IPR2024-00912[1]
Patent 11,600,342 B2

Before JO-ANNE M. KOKOSKI, KIMBERLY McGRAW, and MICHAEL T. CYGAN, *Administrative Patent Judges.*

KOKOSKI, *Administrative Patent Judge.*

DECISION
Denying Petitioner's Requests for Rehearing
of Decisions Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.71(d)

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[1] The papers filed in the two proceedings are the same or substantially similar. Accordingly, we issue a single Decision to be entered in each case. Although the analysis herein applies to both proceedings, unless otherwise noted, we refer to the papers and exhibits filed in IPR2024-00793.

I. INTRODUCTION

Micron Technology, Inc. ("Petitioner") filed a Request for Rehearing of our Decision denying institution of *inter partes* review of claims 1–20[2] ("the challenged claims") of U.S. Patent No. 11,600,342 B2 (Ex. 1001, "the '342 patent") in each of the above-identified proceedings.[3] The Requests challenge our determination that the information presented in the Petitions did not establish a reasonable likelihood of showing that: (1) claims 1–14 and 16–20 would have been obvious over the combined teachings of Seo[4] and Choi[5]; (2) claim 15 would have been obvious over the combined teachings of Seo, Choi, and Izumi[6]; (3) claims 1–3, 5–14, 16, 17, 19, and 20 would have been obvious over Nam[7] and Choi; and (4) claim 15 would have been obvious over Nam, Choi, and Izumi. Dec. 10–21;

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[2] Claims 1–6 and 8–20 are at issue in IPR2024-00793, and claim 7 is challenged in IPR2024-00912. *See* IPR2024-00793, Paper 1 ("793 Pet."); IPR2024-00912, Paper 1 ("912 Pet."). Claim 7 depends from claim 1, and Petitioner's arguments with respect to claim 1 are substantively the same in both proceedings. *Compare* 793 Pet. 29–38, 71–83, *with* 912 Pet. 35–44, 56–68.

[3] *See* IPR2024-00793, Papers 12 ("Decision" or "Dec.") (denying institution on claims 1–6 and 8–20), 13 ("Request" or "Req.") (requesting rehearing); IPR2024-00912, Papers 10 (denying institution on claim 7), 11 (requesting rehearing). Petitioner's arguments on rehearing are substantively the same in both proceedings. *Compare* Req., *with* IPR2024-00912, Paper 11.

[4] Seo, US 2021/0027847 A1, published Jan. 28, 2021 (Ex. 1005).

[5] Bongsik Choi, *Comprehensive evaluation of early retention (fast charge loss within a few seconds) characteristics in tube-type 3-D NAND Flash Memory*, SYMPOSIUM ON VLSI TECHNOLOGY DIGEST OF TECHNICAL PAPERS, 78–79 (2016) (Ex. 1007).

[6] Izumi, US 2012/0151301 A1, published June 14, 2012 (Ex. 1008).

[7] Nam, US 2015/0003169 A1, published Jan. 1, 2015 (Ex. 1006).

IPR2024-00912, Paper 10 at 9–15, 17–20. For the reasons that follow, Petitioner's Requests are denied.

II. STANDARD OF REVIEW

When rehearing a decision on institution, we do not review the merits of the decision *de novo*, but instead review the decision for an abuse of discretion. 37 C.F.R. § 42.71(c). An abuse of discretion may be determined "if a decision is based on an erroneous interpretation of law, if a factual finding is not supported by substantial evidence, or if the decision represents an unreasonable judgment in weighing relevant factors." *Arnold Partnership v. Dudas*, 362 F.3d 1338, 1340 (Fed. Cir. 2004) (citing *In re Gartside*, 203 F.3d 1305, 1315–16 (Fed. Cir. 2000)). The party requesting rehearing has the burden to show that the decision should be modified. 37 C.F.R. § 42.71(d). Additionally, the request for rehearing "must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply." *Id.*

III. ANALYSIS

The Decision rests on our determination that Petitioner did not adequately establish that the combined teachings of Seo and Choi, or the combined teachings of Nam and Choi, disclose the "wherein the read-verification operation removes fast charges of the target memory cell during the first time period" limitation of claim 1 ("Limitation [1.D]"). Dec. 10–16, 18–21. Petitioner argues that reconsideration is appropriate because the Board misunderstood Petitioner's obviousness argument to be an inherency argument. Req. 5–8. Petitioner also argues that the Board overlooked that Seo and Nam disclose or render obvious the voltage magnitudes that

the '342 patent asserts remove fast charges. *Id.* at 8–10. Petitioner further argues that the Board overlooked that Seo and Nam in view of Choi renders obvious the application of voltages long enough to remove fast charges. *Id.* at 11–15.

A. The Board Did Not Misapprehend Petitioner's Arguments

Petitioner argues that the Decision "is premised on the notion that Petitioner relies purely on an 'inherency' argument to show that its proposed combinations 'necessarily' remove fast charges," but "Petitioner did not argue inherency." Req. 5 (citing Dec. 12). Petitioner argues that "the Petition clearly presented an obviousness challenge, pointing not only to what Seo, Nam, and Choi 'expressly teach[],' but also what they would 'fairly suggest[]' to a person of ordinary skill." Req. 5 (citing *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1049 (Fed. Cir. 2019)) (emphasis omitted, alterations in original). According to Petitioner, "[b]y focusing solely on inherency, the Board 'fundamentally misconstrued' and 'failed to adequately evaluate' Petitioner's obviousness argument." *Id.* at 7 (citing *Power Integrations, Inc. v. Lee*, 797 F.3d 1318, 1323–25 (Fed. Cir. 2015)).

We disagree that we misapprehended Petitioner's arguments. In the Petition, Petitioner contends that "Seo discloses [Limitation [1.D]] or, at least, renders it obvious in view of Choi." Pet. 36. Specifically, Petitioner asserts that during a first time period "Seo teaches having a higher voltage on unselected WLs (e.g., adjacent WLs to the selected WL)," and that "[a]s the '342 patent recognizes, this voltage differential removes fast charges." *Id.* Petitioner alternatively asserts that "[t]o the extent that [Patent Owner] argues that Seo does not disclose a 'charge-trap' memory or removal of 'fast charges' (which is incorrect), Seo in view of Choi renders obvious claim

[Limitation] [1.D], because it would have been obvious to employ Seo's read operation in a 3D charge-trap memory with the knowledge that it removes fast charges in view of Choi." *Id.* at 36–37. Petitioner presents similar alternative contentions with respect to the ground based on Nam and Choi. *See id.* at 81–83.

Petitioner's own formulations of the grounds based on either Seo or Nam in combination with Choi posit the alternative theories that either Seo or Nam alone disclose Limitation [1.D], or the combination of either Seo or Nam with Choi teaches this limitation. Although Petitioner did not invoke inherency by name for the theories based on Seo or Nam alone, this is, in effect, the nature of Petitioner's assertions, namely, voltage differentials in Seo and Nam would inherently remove fast charges. For example, with respect to Seo, Petitioner argues that "Seo teaches having a higher voltage on unselected WLs (e.g., adjacent WLs to the selected WL) during the first time period," and "the '342 patent recognizes [that] this voltage differential removes fast charges." Pet. 35–36 (citing Ex. 1001, 12:24–34; Ex. 1003 ¶¶ 129–131) (emphasis omitted); *see also id.* at 82–83 (relying on the '342 patent to support the contention that Nam teaches Limitation [1.D] because Nam "teaches having a higher voltage on unselected WLs (including WLs adjacent to the selected WL) relative to the selected WL during the first time period" (citing Ex. 1001, 12:24–34) (emphasis omitted)). Petitioner does not argue that Seo and Nam expressly disclose removing fast charges or sufficiently explain how a POSITA would have understood that the procedures used in Seo and Nam would have removed fast charges; instead, Petitioner effectively argues that removing fast charges is the inherent result of applying the voltage differential. *See, e.g.*, Pet. 36 (stating Seo would

have been understood to disclose "performing its read operation on charge-trap memories, which removes fast charges").

In the Request, Petitioner reinforces that it did indeed rely on single reference theories for Limitation [1.D] by stating that, because Seo and Nam disclose or teach the same magnitudes of voltages recited in the '342 patent, "there can be no reasonable dispute that Seo and Nam 'generate fields with sufficient magnitude' to remove fast charges." Req. 6. But, Petitioner admits that "Petitioner does not contest that Seo and Nam do not explicitly 'discuss any techniques for removing fast charges during a read-verification operation.'" *Id.* at 7 n.1 (citing Dec. 11). And Petitioner did not (absent an inherent property of the voltages or reliance on Choi) offer an explanation of why the voltages of Seo or Nam would "fairly suggest" that fast charges would be removed during their read-verification operations, as claimed. Although the Request argues that the Petition presented an obviousness theory "combining the read operations of Seo and Nam with a conventional charge trap device," the Request points to a discussion of "Choi's charge trap memory," not a "conventional charge trap device." Req. 8 n.2. Thus, we did not misapprehend the nature of Petitioner's single reference theories.[8] *See Par Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1194–

[8] Alternatively, Petitioner's arguments could be construed as relying on the disclosure of the '342 patent for teaching a POSITA that the voltages used in either Seo or Nam result in fast charge removal. *See, e.g.*, Pet. 36 ("As the '342 patent recognizes, this voltage differential removes fast charges"). However, this argument would not be persuasive. *See In re Glaug*, 283 F.3d 1335, 1341 (Fed. Cir. 2002) ("An inventor's explanation of how the invention works does not render obvious that which is otherwise unobvious.").

95 (Fed. Cir. 2014) ("We have recognized that inherency may supply a missing claim limitation in an obviousness analysis.").

Petitioner's reliance on Choi does not cure the deficiencies set forth above. Petitioner asserts that "Choi explains the primary mechanism and unwanted impact of fast-charge loss on verification," which provides the motivation "to use Seo's and Nam's methods to achieve fast charge removal to improve verification." Req. 7 n.1. But again, Petitioner does not sufficiently explain how a POSITA, looking at Choi, would have understood that either Seo's or Nam's techniques result in fast charge removal. In other words, even if Choi teaches the impact of fast-charge loss on verification, Petitioner fails to sufficiently show that a POSITA would have understood that either Seo or Nam teach or suggest fast charge removal.

It was Petitioner's burden to establish that Seo and Nam, alone or in combination with Choi, disclose Limitation [1.D]. We are not persuaded that we misapprehended the nature of Petitioner's argument when we determined that Petitioner did not meet that burden.

B. The Board Did Not Overlook the Petition's Arguments Regarding Voltage Magnitude

Petitioner also argues that "the Board overlooked that the Petition establishes that the voltages of Seo and Nam have the very same magnitudes that the '342 patent asserts remove fast charges." Req. 8; *see also id.* at 9–10 (citing Pet. 32–35, 48, 49, 75, 78, 80, 92) (emphasis omitted). This argument essentially asks us to reconsider the merits of Petitioner's single reference inherency theories for Limitation [1.D] and fails to show that the Board overlooked any showings in the Petition. *See id.* at 10 ("There can be no reasonable dispute that Seo and Nam generate an electric field of a sufficient magnitude to remove fast charges."). As explained in the

Decision, we determined that there is insufficient evidence in the record to show that, even if the voltages allegedly disclosed in Seo and Nam are accurate, Seo and Nam necessarily disclose the removal of fast charges. *See* Dec. 12–13, 19–20.

To the extent Petitioner argues that the Petition presented obviousness theories that each of Seo and Nam alone, based on the knowledge of one of ordinary skill in the art, render Limitation [1.D] obvious, the Petition falls short of providing an adequate showing to meet this limitation on these bases. *See* Req. 8 n.2 ("The Petition, however, advances an obviousness theory, combining the read operations of Seo and Nam with a conventional charge trap device."). Even assuming, without deciding, that it would have been obvious to implement Seo and Nam with charge-trap memory devices, Petitioner does not point to evidence sufficient to show that a POSITA would have understood that the alleged voltages disclosed in Seo and Nam would lead to removal of fast charges in charge-trap memory devices, absent improper reliance on the teachings of the '342 patent. *See* Dec. 13–16, 19–20; *KSR Intern. Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007) (citing *Graham v. Deere*, 383 U.S. 1, 36 (1966) for its "warning against a 'temptation to read into the prior art the teachings of the invention at issue'").

In particular, Petitioner does not allege that the evidence relied on for the knowledge of one of ordinary skill in the art relating to charge-trap memory devices demonstrates fast charge removal. *See* Pet. 36, 81–82. And although Petitioner cites its declarant, Dr. Liu, for the proposition that "Seo discloses, and would have been understood to disclose, performing its read operation on charge-trap memories, which removes fast charges,"

Dr. Liu does not cite objective evidence to support this assertion, aside from the '342 patent itself. *Id.* at 36 (citing Ex. 1003 ¶ 136).

Moreover, Dr. Liu's testimony simply circles back to logic similar to that relied on with respect to the inherency theory, namely that, given certain similarities between Seo and the '342 patent, Seo removes fast charges because the '342 patent teaches removing fast charges, even though Seo does not explicitly teach doing so. *See* Ex. 1003 ¶ 136 ("[A] POSITA would have immediately understood from reading Seo that Seo is disclosing its read operation as applicable to Flash memories, including Flash charge-trap memories. And as the '342 states, Seo's operation would remove fast charges in a charge-trap memory." (citing Ex. 1001, Abstract)). As already discussed, we disagree with this logic based on the lack of sufficient evidence to support its conclusion. *See* Dec. 13 ("Petitioner and Dr. Liu do not provide any objective evidence or explanation as to how or why a POSITA would have understood that Seo's voltage amounts applied during Seo's time periods operate the same way [as in the '342 patent] on Seo's memory device to generate fields with sufficient magnitude and duration to remove fast charges."). Petitioner's assertions regarding Nam suffer from the same shortcomings. *See* Dec. 19–20; Pet 82 ("[A] POSITA would have found that Nam's teachings are applicable to charge-trap devices"); Ex. 1003 ¶¶ 293–298.

C. The Board Did Not Overlook the Petition's Arguments Regarding the Duration of Voltage Application

Petitioner argues that the Board overlooked "Petitioner's showing that the prior art references render obvious application of the three key voltages for a sufficient duration to remove fast charges." Req. 11 (emphasis omitted). Specifically, Petitioner states that "the Petition did not need to

make any additional showing or identify a specific 'duration' for two independent reasons," which the Board allegedly overlooked. *Id.* at 12. First, Petitioner argues that "the Petition need not recite a specific duration that the voltages are applied, because the Grounds advance an argument that it would have been ***obvious*** to apply the methods of Seo and Nam in a manner that actually removes fast charges." *Id.* Second, Petitioner argues that "the Board overlooked that the '342 patent asserts that fast charges 'can be easily lost'—even without an intentional application of voltages to accelerate the loss—suggesting that an electric field need not be present for a lengthy period to de-trap fast charges." *Id.* at 13.

Petitioner's arguments are not persuasive. In the Decision, we determined that Petitioner presented insufficient evidence that either Seo or Nam alone, or in combination with Choi, disclose or render obvious the removal of fast charges as recited in Limitation [1.D]. Dec. 12–16, 19–20. Specifically, we determined that "Petitioner and Dr. Liu do not provide any objective evidence or explanation as to how or why a POSITA would have understood that Seo's voltage amounts applied during Seo's time periods operate the same way [as in the '342 patent] on Seo's memory device to generate fields with sufficient magnitude and duration to remove fast charges." *Id.* at 13. In other words, whatever the duration, Petitioner failed to show that Seo teaches applying voltages that result in removal of fast charges for the reasons given in the Decision. We provided a similar determination with respect to Nam. *See id.* at 19.

We are also not convinced that we abused our discretion when we determined that the combinations of Seo or Nam with Choi were not persuasive. Dec. 14–15, 19–20. For example, we determined that

"Dr. Liu's statement that '[a] POSITA would have recognized that the lateral-electrical-field-inducing voltage differential, as Seo discloses, is what Choi describes as driving the lateral fast-charge loss,' is not supported by objective evidence or sufficient explanation as to why a POSITA would have come to that understanding" and was therefore insufficient to support Petitioner's asserted motivation to combine Seo with Choi. *Id.* at 14–15. In particular, we were not persuaded that "Seo creates a large lateral electric field like the one described in Choi," and, in any case, we disagreed that "Choi teaches that a large lateral electric field removes fast charges." *Id.* at 15.

Accordingly, regardless of the duration of the voltage application described in Seo, Petitioner failed to show that the combination of Seo and Choi would result in removal of fast charges. We further determined that Petitioner's combination of Nam with Choi was problematic for similar reasons, given Petitioner's reliance on similar arguments. *See id.* at 20.

IV. CONCLUSION

We reviewed and considered the arguments in Petitioner's Requests, and conclude that Petitioner does not carry its burden of demonstrating that we misapprehended or overlooked any matters, and therefore abused our discretion, in denying institution of *inter partes* review of the challenged claims of the '342 patent. 37 C.F.R. § 42.71(d).

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner's Requests for Rehearing (IPR2024-00793, Paper 13; IPR2024-00912, Paper 11) are *denied*.

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