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Paper 27
Entered: August 8, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY, INC.,
Petitioner,

v.

YANGTZE MEMORY TECHNOLOGIES CO., LTD.,
Patent Owner.

IPR2025-00244
Patent 10,886,291 B2

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

McGRAW, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner, Micron Technology, Inc., filed a petition for *inter partes* review of claims 2–5, 8, 9, 11, 12, and 14–19 of U.S. Patent No. 10,886,291 B2 (Ex. 1001, "the '291 patent"). Paper 1 ("Pet." or "Petition"). Patent Owner, Yangtze Memory Technologies Co., Ltd. ("YMTC"), filed a Preliminary Response. Paper 16 ("Prelim. Resp."). In the Preliminary Response, Patent Owner indicates that it filed a Statutory Disclaimer (Ex. 2008) pursuant to 35 U.S.C. § 253 and 37 C.F.R. § 1.321(a), disclaiming claims 1–5, 8, and 9 of the '291 patent, and, accordingly, only claims 11, 12, and 14–19 ("the challenged claims") are at issue. Prelim. Resp. 6–7 (citing Ex. 2008; Ex. 2006 ¶¶ 35–37).

Petitioner also filed a Petitioner's Ranking and Explanation for its two petitions challenging the '291 patent (Paper 3) to which Patent Owner filed a response (Paper 15).

Per the bifurcation process, Patent Owner filed Brief on Discretionary Denial (Paper 14) to which Petitioner filed an Opposition (Paper 22, "Opposition Brief"). The Director's delegee denied Patent Owner's request for discretionary denial. Paper 23.

Under the authority delegated to us by the Director under 37 C.F.R. § 42.4(a), we may only institute an *inter partes* review when "the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a); *see also* 37 C.F.R. § 42.108(c). Based upon our review of the present record, Petitioner has not sufficiently shown a reasonable likelihood it will

prevail with respect to at least one of the challenged claims. Accordingly, we do not institute *inter partes* review.

II. BACKGROUND

A. Patent Owner's Disclaimer of Claims 1–5, 8, and 9

As indicated above, Patent Owner filed a statutory disclaimer of claims 1–5, 8, and 9 of the '291 patent. *See* Ex. 2008. In view of Patent Owner's statutory disclaimer, we treat claims 1–5, 8, and 9 as having never been part of the '291 patent. *See Vectra Fitness, Inc. v. TNWK Corp.*, 162 F.3d 1379, 1383 (Fed. Cir. 1998) ("This court has interpreted the term 'considered as part of the original patent' in [35 U.S.C.] § 253 to mean that the patent is treated as though the disclaimed claims never existed."). Because *inter partes* review cannot be instituted based on disclaimed claims, claims 1–5, 8, and 9 are outside the scope of this proceeding. 37 C.F.R. § 42.107(e) ("No inter partes review will be instituted based on disclaimed claims."); *General Elec. Co. v. United Techs. Corp.*, IPR2017-00491, Paper 9 (PTAB July 6, 2017) (precedential) (denying institution in view of a statutory disclaimer of all the challenged claims). Thus, we confine our analysis in this Decision to claims 11, 12, and 14–19, the remaining challenged claims that have not been disclaimed.

B. Real Parties in Interest

Petitioner identifies itself (Micron Technology, Inc.) "and its subsidiaries, including Micron Consumer Products Group LLC" as the real parties in interest. Pet. 4.

Patent Owner identifies itself (Yangtze Memory Technologies Co., Ltd.) as the real party in interest. Paper 6, 1 (Patent Owner's Mandatory Notices).

C. Related Matters

The parties identify *Yangtze Memory Technologies Company, Ltd. v. Micron Technology, Inc. and Micron Consumer Products Group*, No. 3:24- cv-04223 (N.D. Cal.), which was consolidated with *Yangtze Memory Technologies Company, Ltd. v. Micron Technology, Inc. and Micron Consumer Products Group, LLC*, No. 3:23-cv-05792-RFL (N.D. Cal.) as related matters. *See* Pet. 5; Paper 6, 1.

Petitioner also identifies twenty-three additional IPR proceedings that challenge patents that Patent Owner asserted in the District Court Litigation, including IPR2024-000294, which challenges claims 6, 8, 10, and 20 of the '291 patent. Pet. 5–6.

D. The '291 Patent (Ex. 1001)

The '291 patent, titled "Joint Opening Structures of Three-Dimensional Memory Devices and Methods for Forming the Same" is directed to methods for forming channel holes in 3D memory devices. *See* Ex. 1001, codes (10), (54), 57. The patent states that as semiconductor technology advances, it becomes difficult to use a single etching process to form the channel holes in the 3D memory devices that have a substantial depth. *See* Ex. 1001, codes (54), (57), 1:24–29. To address this problem, the '291 patent discloses methods to form a joint opening structure of a 3D memory device by combining two through hole formation processes. *See id.* at 1:39–2:5, 15:37–40. This process may allow the formed channel hole

having the joint opening structure to have a large aspect ratio and a limited top-bottom aperture error. *See id.* at 15:40–42.

E. The Challenged Claims

Petitioner challenges independent apparatus claim 11 and dependent claims 12 and 14–19 of the '291 patent. Pet. 9. Because Petitioner's arguments regarding apparatus claim 11 refer to method claim 1, both claims 1 and 11, with Petitioner's bracketed material added, are reproduced below.

[1.PRE] A method of forming a joint opening structure in a three dimensional (3D) memory device, comprising:

[1.A] forming a first stacked layer and forming a first insulating connection layer on the first stacked layer;

[1.B] forming a first through hole that penetrates the first stacked layer and the first insulating connection layer;

[1.C] forming a first channel structure overlaying the surface of the substrate that is exposed by the first through hole;

[1.D] forming a first functional layer on the sidewall of the first through hole;

[1.E] forming a second channel structure and forming a first filling structure on the sidewall of the first functional layer and the exposed surface of the first channel structure;

[1.F] forming *a third channel structure* in contact with the second channel structure above the first through hole, wherein a projection of the third channel structure on the substrate covers a projection of the first through hole on the substrate;

[1.G] *forming a second stacked layer and forming a second insulating connection layer on the first insulating connection layer;*

[1.H] forming a second through hole that penetrates the second stacked layer and the second insulating connection layer, wherein a projection of the second through hole on the substrate at least partially overlaps with the projection of

the first through hole on the substrate;

[1.I] forming a second functional layer on the sidewall of the second through hole;

[1.J] forming a fourth channel structure and forming a second filling structure on the sidewall of the second functional layer and the exposed surface of the third channel structure; and

[1.K] forming a fifth channel structure in contact with the fourth channel structure above the second through hole.

Ex. 1001, 43:43–44:10; Pet. xii–xiii (emphasis added).

[11.PRE] A joint opening structure of a three-dimensional (3D) memory device, comprising:

[11.A] a first stacked layer disposed overlaying a substrate;

[11.B] a first insulating connection layer disposed on the first stacked layer;

[11.C] a first through hole penetrating the first stacked layer and the first insulating connection layer;

[11.D] a first channel structure disposed at the bottom of the first through hole and overlaying the substrate;

[11.E] a first functional layer disposed on the sidewall of the first through hole;

[11.F] a second channel structure in contact with the first channel structure disposed on the sidewall of the first functional layer;

[11.G] *a third channel structure* in contact with the second channel structure disposed over the first through hole, wherein a projection of the third channel structure on the substrate covers a projection of the first through hole on the substrate;

[11.H] *a second stacked layer disposed on the third channel structure*;

[11.I] *a second insulating connection layer disposed on the second stacked layer*;

[11.J] a second through hole penetrating the second stacked layer and the second insulating connection layer, wherein a projection of the second through hole on the substrate at least partially overlaps with the projection of the first through hole on the substrate;

[11.K] a second functional layer disposed on the sidewall of the second through hole;

[11.L] a fourth channel structure in contact with the third channel structure disposed on the sidewall of the second functional layer; and

[11.M] a fifth channel structure in contact with the fourth channel structure disposed over the second through hole.

Ex. 1001, 45:52–46:20; Pet. xv–xvi (emphasis added).

F. Asserted Grounds of Unpatentability

Petitioner contends claims 11, 12, and 14–19 are unpatentable on the following ground.

Claims Challenged	35 U.S.C. §[1]	Reference(s)/Basis
11, 12, 14–19	103	Costa[2]

Pet. 9.

In support of its unpatentability arguments, Petitioner relies on the declaration of Sanjay K. Banerjee, Ph.D. (Ex. 1003). Patent Owner relies on the declaration of Sunil P. Khatri, Ph.D. (Ex. 2006).

[1] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. § 103. The earliest claimed priority date for the '241 patent is after the effective date of the applicable AIA amendment. *See* Ex. 1001, (63). Thus, we refer to the AIA version of 35 U.S.C. § 103.

[2] Costa, US 2018/001282771 (filed Feb. 28, 2017, published Jun. 28, 2018) (Ex. 1005, "Costa").

III. ANALYSIS

A. Level of Ordinary Skill in the Art

In determining whether a claimed invention would have been obvious, we consider the level of ordinary skill at the time of filing. 35 U.S.C. § 103; *see also Graham v. John Deere Co*., 383 U.S. 1, 17 (1966) (discussing pre-AIA obviousness). Petitioner contends that a person of ordinary skill in the art ("POSITA") would have had a bachelor's degree in electrical engineering or a similar discipline, along with 2–3 years of professional experience working with (e.g., researching, designing, or teaching) monolithic 3D structures and NAND memory devices, or an equivalent level of skill, knowledge, and experience (e.g., an advanced degree may replace some of the professional experience). Pet. 24. Petitioner also asserts that a POSITA would have been aware of and generally knowledgeable about 3D NAND's structure, how it is manufactured, and its component parts. *Id.* (citing Ex. 1003 ¶¶ 36–40). Patent Owner does not take a position on the level of ordinary skill in the art. Prelim. Resp. 11; *see also* Ex. 2006 ¶ 34 (applying Petitioner's definition of a POSITA to the opinions set forth in the declaration but reserving the right to opine to an alternative level of a POSITA).

At this stage of the proceeding, we adopt Petitioner's definition of a POSITA as it appears consistent with the level of ordinary skill in the art that is reflected by the prior art of record.

B. Claim Construction

We construe the '291 patent claims using the same claim construction standard that would be used to construe a claim in a civil action under 35 U.S.C. § 282(b), including construing the claim in accordance with

the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Petitioner states that none of the claims require express construction and the claims should receive their plain and ordinary meaning. Pet. 21. For claim 4, however, Petitioner addresses YMTC's claim construction in the related district court litigation, asserting that YMTC's claim construction provides an erroneous ordering of certain steps for forming certain layers. *Id.* at 21–24. Claim 4 is not challenged in this proceeding and no construction of this claim is required to resolve the issues in dispute.

The parties also dispute the meaning of the term "on" in claim element [11.H], which recites "a second stacked layer *disposed on* the third channel structure." We address the construction of this term below when addressing claim 11.

C. Principles of Law

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")); *see also* 37 C.F.R. § 42.104(b) (requiring a petition for *inter partes* review to identify how the

challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

A claim is unpatentable under 35 U.S.C. § 103 if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the [relevant time frame] to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence[3], objective evidence of obviousness or nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co*., 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2016) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness")).

D. Overview of Asserted Art

1. Costa (Ex. 1005)

Costa is a US Patent Publication, titled "Three-Dimensional Memory Devices Containing Inter-Tier Dummy Memory Cells and Methods of

[3] The present record does not contain evidence of secondary considerations. *See* Pet. 97; *see generally* Prelim. Resp.

Making the Same," that is directed to providing a reliable connection between vertically neighboring memory stack structures. Ex. 1005, codes (12), (54), ¶ 3. Costa describes "challenges for fabricating a multi-tier memory stack structure [as including] formation of memory openings having high aspect ratios and alleviation of effects of misalignment of tier-level memory openings formed in different tier structures." *Id.* ¶ 3.

E. Asserted Unpatentability of Claims 11, 12, and 14–19 over Costa

1. Petitioner's Arguments

In its "Prior Art Overview," Petitioner states that "Costa discloses forming a vertical memory channel (shown in green below) in a multi-tier three-dimensional memory structure." Pet. 24–25 (citing Ex. 1005 ¶ 2, Fig. 21G; Ex. 1003 ¶¶ 86–87); *see also id.* at 29 (citing Ex. 1005, Fig. 21G as showing a formed vertical memory channel).

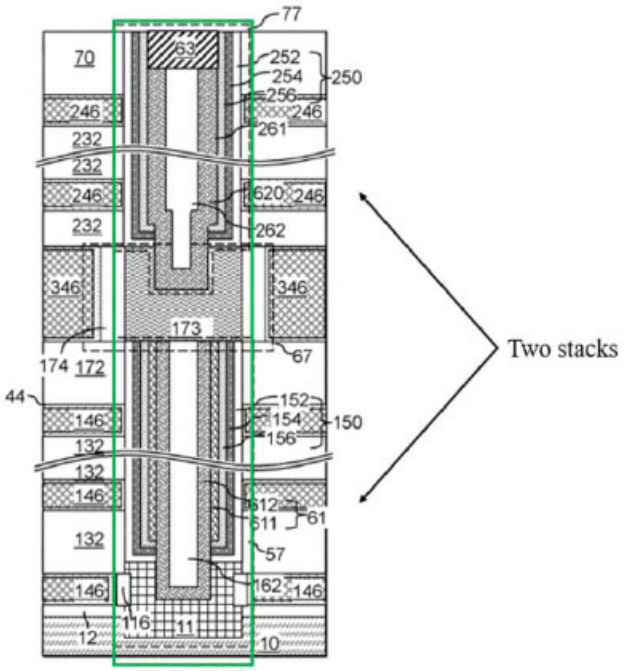


FIG. 21G

Costa Figure 21G, with Petitioner's annotations added, is a vertical cross-sectional view of the region of the third exemplary structure after processing steps corresponding to the processing steps of FIG. 14B according to the third embodiment of the present disclosure." Ex. 1005 ¶ 81, Fig. 21G; Pet. 24–25, 29 (citing Ex. 1005, Fig. 21G).

Petitioner contends that independent claim 11 and its dependent claims 12 and 14–19 would have been obvious over Costa. Pet. 90–97 (citing Pet. 29–71). In particular, Petitioner states that when the '291 patent uses the term "joint opening structure" it is referring to "forming channel structures in multi-tier memory devices using two etch processes." *Id.* at 30 (citing Ex. 1003 ¶¶ 115–117). Petitioner maps Costa to claim 11 stating Costa discloses or suggests forming a joint opening structure of a three-dimensional (3D) memory device (forming channel structures in multi-tier memory devices using two etch process) that comprises a first stacked layer (first alternating stack 132, 142) over a substrate, insulating connection layer (first insulating cap layer 172), a first through hole (first-tier memory opening 149), a first channel structure (epitaxial channel portion 11), a first functional layer (first memory film 150 with or without optional semiconductor channel layer 611); a second channel structure (first inner semiconductor channel layer 612); a third channel structure (joint-level doped semiconductor portion 173); second stacked layer (second alternating stack 232, 242); a second insulating connection layer (insulating cap layer 70); a second through hole (second-tier memory opening 249); a second functional layer (second memory film 250 with or without optional second outer semiconductor channel layer 621); a fourth channel structure (second inner semiconductor layer 622 with or without optional layer 621); and a fifth channel structure (drain region 63). Pet. 90–97 (citing, *inter alia,*

Pet. 29–71; Ex. 1005, Figs. 1, 2B, 3A, 3B, 4A–4G, 5B, 10A–11F, 20A–20C, 21A–21D, 21F, 22A–B, 23B, 49A–B, 50B, 72A–B, 73A–B, 74B, 101A–B, 102A–B, 103B).

More particularly, Petitioner states that each limitation of claim 11 is either "present" or is "substantively the same" as a corresponding limitation in method claim 1 and Costa either "discloses it" or "discloses it, or renders it obvious" for "the same reasons" set forth for claim 1. *See id.* at 90–92. For example, with respect to claim element [11.G], directed to "a third channel structure,"[4] Petitioner states that this limitation is substantively the same as [1.F] but recites *disposed over* instead of *formed above* and that Costa discloses it, or renders it obvious, for the same reasons. *Id*. at 91.

For claim element [11.H], directed to "a second stacked layer disposed on the third channel structure," Petitioner asserts that this limitation "is present in [1.G] and Costa discloses it for the same reasons." *Id.* at 92. For claim element [11.I], which recites "a second insulating connection layer disposed on the second stacked layer," Petitioner also asserts that "[t]his limitation is present in [1.G] and Costa discloses it for the same reasons." *Id*. In addressing [1.G], the Petition states:

> Costa discloses the same [as the '291 patent], namely, forming a second stacked layer ("second alternating stack" 232, 242) and forming a second insulating connection layer ("insulating cap layer 70") on the first insulating connection layer ("first insulating cap layer 172"); Banerjee ¶¶ 206, 208. As shown in Figure 21A below, "second alternating stack (232,

[4] Claim element [11.G] recites "a third channel structure in contact with the second channel disposed over the first through hole, wherein a projection of the third channel structure on the substrate covers a projection of the first through hole on the substrate."

242) of material layers is subsequently formed on the top surface of the joint-level material layers….[5]" Costa, [0178] (describing the process of Figs. 8A-B), [0270] (referring to "the processing steps of" Figs. 7A-10B using the third exemplary structure's single joint-level doped semiconductor portion 173), [0263], Figs. 8A-B, Fig. 21A; Banerjee ¶ 209. "An insulating cap layer 70 can be subsequently formed over the second alternating stack (232, 242)." Costa, [0183]; Banerjee ¶ 210. Thus, second alternating stack (232, 242) and insulating cap layer 70 are formed "on" first-tier insulating cap layer 172. Banerjee ¶ 211; Ex. 1001, 8:3-8 ("on" does not require directly on).

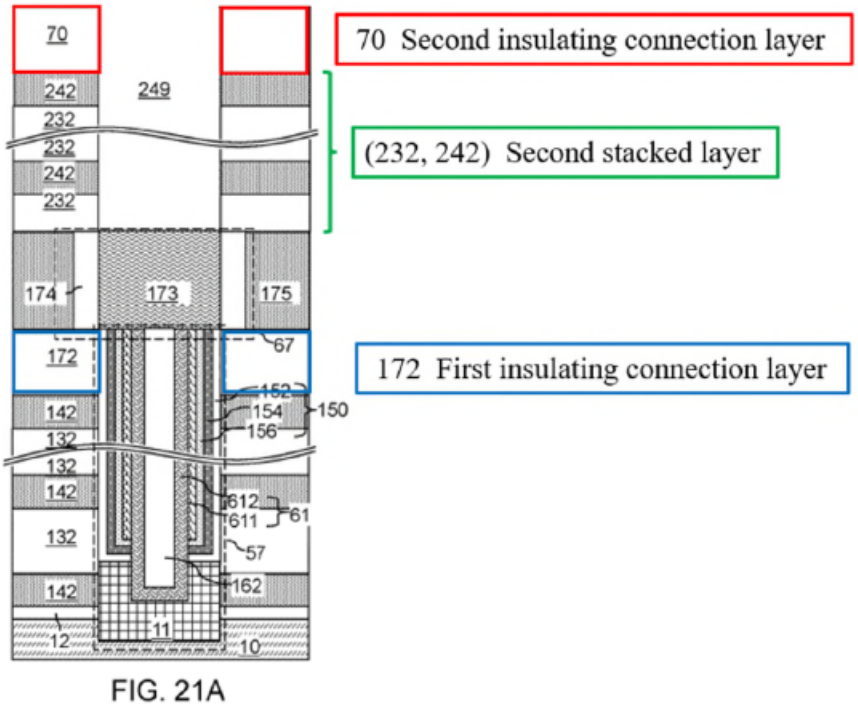


FIG. 21A

Pet. 55–56.

[5] The omitted text identifies the joint-level material layers as layers 175, 176, 177. *See* Ex. 1005 ¶ 178; Pet. 55.

2. Patent Owner's Arguments

Patent Owner contends Petitioner has not shown that Costa discloses or suggests a "second stacked layer ***disposed on*** the third channel structure" as required by apparatus claim element [11.H]. Prelim. Resp. 5 (citing, *inter alia*, Petitioner's annotated Fig. 21A); *id.* at 20–32. Patent Owner asserts that Petitioner does not even assert that Costa discloses that its second alternating stack 232, 242 is "disposed on" the semiconductor portion 173 (i.e., the asserted third channel structure) or that such an arrangement would have been obvious. *Id.* at 6; *see also id.* at 21–22 (stating limitation [1.G] does not require that the "second stacked layer" is "*disposed on the third channel structure*" as required by [11.H]). Patent Owner further annotates Petitioner's annotation of Costa Figure 21 to highlight element 173 in yellow to show that Costa's second stacked layer (green) is not *disposed on* the semiconductor portion 173, the asserted third channel structure (yellow).

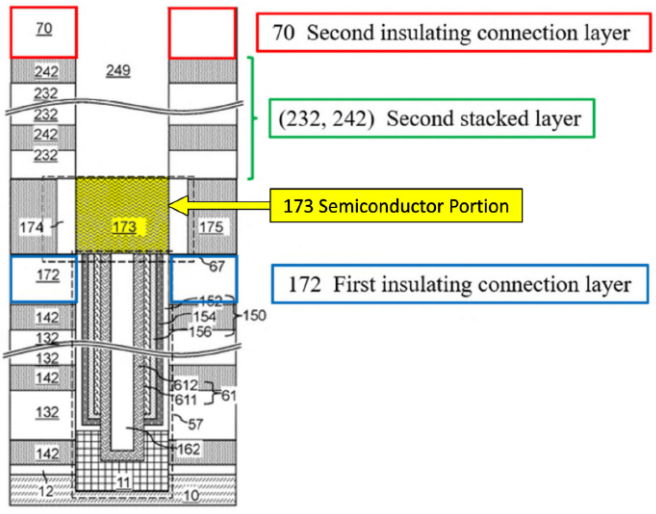


FIG. 21A

Costa Figure 21A, with Petitioner's annotations (red, green, blue) and Patent Owner's annotations (yellow) added. Prelim. Resp. 5; Pet. 56.

In particular, Patent Owner asserts that because Costa's second stacked layer does not laterally overlap with semiconductor portion 173, Costa's second stacked layer is not "disposed on" the third channel structure. *Id.*

Finally, Patent Owner contends that by relying only on claim 1's method steps, Petitioner's arguments ignore the "final apparatus" that Petitioner alleges meets the claim limitations. Prelim. Resp. 22 (quoting Pet. 70 as stating any argument regarding Costa's "finished configuration is irrelevant" to the method step in limitation [1.K]), 29–30.

3. Analysis

A petition is required to identify "with particularity[ ] the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge." 35 U.S.C. § 312(a)(3). The "petition . . . must include . . . [a] full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence"). 37 C.F.R. § 42.22(a)(2). Our rules require that a petition include fully developed arguments. *See* 37 C.F.R. § 42.22(a)(2) (the "petition . . . must include . . . [a] full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence"). The petition must include both an adequate explanation of how the claims should be construed as well as how the construed claims are unpatentable over the asserted prior art. 37 C.F.R. § 42.104(b)(3), (b)(4). Additionally, the "petition must specify where each element of the claim is found in the prior art." 37 C.F.R. § 42.104(b)(4). A petition should also "explain why a person of ordinary skill in the art would have combined elements from specific references in the way the claimed invention does." *ActiveVideo Networks, Inc. v. Verizon Comm'ns, Inc.*, 694 F.3d 1312,

1328 (Fed. Cir. 2012). Thus, based on our rules, we only consider fully developed arguments set forth in the petition.

We agree with Patent Owner that the Petition fails to sufficiently show that Costa teaches a "second stacked layer *disposed on the third channel structure"* as required by apparatus claim element [11.H]. The Petition relies on claim element [1.G] for "disclosing" both claim element [11.H] and [11.I]. *See* Pet. 91 (citing Pet. 54–57). Method claim element [1.G], however, merely recites "forming a second stacked layer" without requiring that the second stacked layer be "*disposed on the third channel structure*," as required by claim element [11.H].[6]

Review of Petitioner's arguments for element [1.G] shows that while the Petition does assert that the second stacked layer is disposed on certain structures recited in other elements of claim 11, the Petition fails to assert that the second stacked layer is *disposed on the third channel structure* as recited in claim element [11.H]. For example, the Petition does state that Costa's second alternating stack 232, 242 is formed "on the top surface of joint-level material layers" (Pet. 55–56 (citing Ex. 1005 ¶ 178)) as well as "'on' first-tier insulating cap layer 172" (Pet. 56 (citing Ex. 1005, Fig. 21A)). However, neither the joint-level material layers nor the first-tier insulating cap layers are the asserted third channel structure 173. *See* Ex. 1005 ¶ 178 (identifying joint-level material layers as layers 175–177);

[6] Claim element [1.G] also requires "forming a second insulating connection layer on the first insulating connection layer" as similarly recited in claim element [11.I]. *See* Pet. 91 (also relying on claim element [1.G] for disclosing claim element [11.I], which recites "a second insulating connection layer on the first insulating connection layer.").

see also id. at Figs. 6C–6F (illustrating the deposition and etching of layers 175–177 and their relation to element 173). Thus, Petitioner fails to expressly assert that the second stacked layer is disposed on the third channel structure.

In its Opposition Brief to Patent Owner's brief on discretionary denial, Petitioner provides a number of arguments that Costa discloses or teaches a secondary stacked structure on the third channel structure as required by claim element 11.H. *See* Paper 22, 24–41. The panel does not consider merits arguments made in discretionary denial briefing, including a petitioner's opposition briefing. *See* FAQ 12[7] (stating the Board panel is not to consider merits arguments made in a discretionary denial brief or related briefing, such as an opposition brief by a petitioner).

To the extent that Petitioner alleges that the arguments set forth in the Opposition Brief were presented in the Petition, we disagree. *See, e.g.,* Paper 22, 24 (stating "the Petition demonstrates how Costa discloses the claim limitations in an incredibly straightforward way"), 29 (stating the Petition shows Costa discloses a second stacked layer on a third channel structure).

First, in its Opposition Brief, Petitioner argues that Costa discloses a second stacked layer disposed on the third channel structure *under a claim construction that does not require the second stacked structure to laterally overlap with the third channel structure*. *See e.g.*, Paper 22, 33–36. To support this argument, Petitioner presents a number of claim construction

[7] Available at https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management.

arguments. *See, e.g., id.* at 34–35 (arguing that "on" does not require overlap in the Z direction but "includes both objects that are merely touching (in any dimension) ***and*** objects that are in proximity to each other but not touching" (citing Ex. 1078, 1; Ex. 1001, 8:3–12)); *see also id.* at 36–38 (arguing that if "on" is construed to mean "directly on or on with an intermediate feature or layer therebetween," then Costa's second stacked layer 232, 242 and third channel structure (173) are "directly on" each other, because their edges are directly touching each other). The Petition, however, does not clearly present any of the claim construction arguments set forth in the Opposition Brief. *See* Paper 22 (not clearly identifying where the Petition provides the proposed claim construction); *see generally* Pet.; *see also* Pet. 33, 43, 56 (arguing "on" does not require "directly on" and permits intermediate layers but not presenting any of the other claim construction arguments set forth in the Opposition Brief).

Nor did the Petition provide any particularized argument as to how Costa discloses or suggests a second stacked layer *disposed on* the third channel structure applying any of the claim constructions proposed in the Opposition Brief. *See generally* Pet. (presenting no argument that Costa's second stacked layer 232, 242 is "on" semiconduction portion layer 173 (the asserted third channel structure) because they touch each other as shown above in Petitioner's annotation of Costa Figure 21A). We will not consider any arguments not sufficiently set forth in the Petition. *See* 37 C.F.R. § 42.104(b)(3) ("the petition must set forth . . . [h]ow the challenged claim is to be construed"); 37 C.F.R. § 42.104(b)(4) ("the petition must set forth . . . [h]ow the construed claim is unpatentable").

Second, Petitioner's Opposition Brief also asserts even if the claims require that the second stacked layers do, in fact, overlap with the third channel structure, that the Petition made this showing. Paper 22, 29–33, 38–41. To support this argument, Petitioner cites to the Petition's analysis of [1.F] as showing that the third channel structure (element 173) is wider in some embodiments and that it would have been obvious to widen Costa's third channel structure to be wider than the underlying hole in which the channel structure resides. *Id.* at 31–33 (citing Pet. 48–54; Ex. 1005, Fig. 20B; Ex. 1024 ¶ 61, Figs. 3A, 5B). Petitioner asserts that by including a heading reciting the claim language which includes the "on" limitation and stating that "Costa discloses it," the Petition provides a sufficiently clear mapping that the second stacked structure is disposed on the third channel structure. *Id.* at 40 (stating the Petition sufficiently shows claim element [11.H] is met "because under the heading that recites the claim language which includes the word "on", the Petition states "Costa discloses it," that is Costa discloses the "on" limitation); *see also id*. at 38–39 (stating the Petition's [1.G] analysis "describes the formation of the 'second stack [layer]' and demonstrates that it is formed 'on' the 'third channel structure'" and citing Pet. 45–57).

Even if the Petition did argue that certain of Costa's embodiments disclosed or suggested an extended third channel structure, the Petition did not clearly assert that Costa's second stacked layer would be disposed on any such extended channel structure. *See, e.g.,* Pet. 45–57, 92. Simply including a heading reciting the claim limitation and then asserting that the art "discloses it" does not satisfy Petitioner's burden. *See id.* Such an approach obscures exactly what Petitioner is relying on as disclosing the

limitations of claim element [11.H] and improperly shifts the burden of deciphering Petitioner's arguments onto Patent Owner and the Board. *See* 35 U.S.C. § 312(a)(3); *see also DeSilva v. DiLeonardi*, 181 F.3d 865, 866–67 (7th Cir. 1999) ("A brief must make all arguments accessible to the judges, rather than ask them to play archeologist with the record.").

Additionally, we agree with Patent Owner that Petitioner does not sufficiently allege that Costa discloses the *apparatus* meeting each of the limitations of claim 11. In its Opposition Brief, Petitioner states that claim 1 details what the apparatus "after fabrication" includes, thereby clearly setting for the basis for claim 11's reliance on claim 1's analysis. Paper 22, 39–40 (citing Prelim. Resp. 92). However, the Petition expressly states that claim 1 is a method, not an apparatus claim, and that any argument by Patent Owner that an element is missing "in [Costa's] finished configuration is irrelevant." Pet. 70. Petitioner presents no clear argument that each of the structures formed during fabrication, including the asserted second stacked structure (layers 232, 242), remain after fabrication is complete. *See generally* Pet.

Indeed, Costa's Figure 21G shows that after layers 232 and 242 are deposited, layer 242 is removed during a later fabrication step and replaced with layer 246. *See* Pet. 25, 29, 82 (citing Ex. 1005, Fig. 21G, reproduced below (with Petitioner's annotations added).

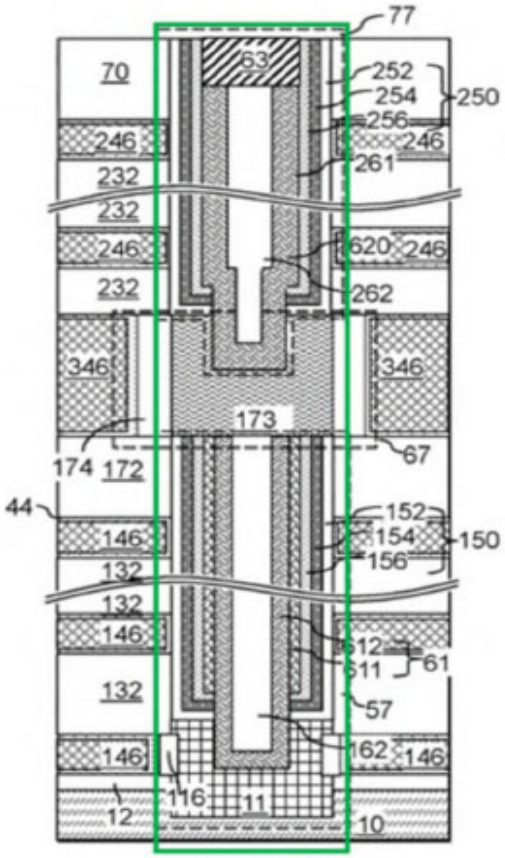


FIG. 21G

Thus, based on the present record, including figures provided by Petitioner, the Costa apparatus, after fabrication, does not contain layer 242, which Petitioner relies upon for disclosing the second stack structure. *See* Pet. 25, 29, 82. To the extent Petitioner contends that a structure in Costa that is formed before the fabrication step of removing layer 242 constitutes an "*apparatus—after fabrication*" or otherwise contends that Costa's structure after fabrication would in fact contain a second stacked structure comprising layers 232 and 242, any such argument is not clearly articulated in the Petition.

In view of these deficiencies, the Petition fails to identify the proposed grounds for review with particularity as required by 35 U.S.C. § 312(a)(3) with respect to the limitations of independent claim [11.H]. Petitioner presents no arguments or evidence with respect to the dependent claims challenged under this ground that would remedy the defects noted above with respect to independent claim 11. *See generally* Pet. Thus, Petitioner has failed to demonstrate a reasonable likelihood that the subject matter of claims 11, 12, or 14–19 would have been obvious over Costa.

F. Patent Owner's Parallel Petitions Argument

Petitioner filed petitions in both the instant proceeding and in IPR2024-00294 challenging the patentability of claims of the '241 patent. Patent Owner argues that the Board should not exercise its discretion to institute more than one petition challenging the '241 patent. Paper 11, 1–5.

Because we determine that Petitioner did not show a reasonable likelihood that it would prevail on the merits, we do not address Patent Owner's parallel petitions argument.

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to at least one challenged claim of the '291 patent. Accordingly, we do not institute inter partes review.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied as to all challenged claims of U.S. Patent No. 10,886,291 B2, and no trial is instituted.

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