

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDTRONIC, INC.,

Petitioner

v.

MOSKOWITZ FAMILY LLC,

Patent Owner

IPR2026-00121
Patent 11,864,755

PATENT OWNER'S RESPONSE

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Patent Trial and Appeal Board
U.S. Patent and Trademark Office
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PATENT OWNER'S EXHIBIT LIST

Exhibit	Description
2001	Pretrial Scheduling Order, <i>Moskowitz Family LLC v. Medtronic, Inc. et. al.</i> , No. 0:25-CV-00769-PJS-DLM, ECF No. 36 (Dist. Of Minn. September 10, 2025) (Micko, D.)
2002	Stipulation Extending Time For Defendants To Respond To Plaintiff's Complaint, <i>Moskowitz Family LLC v. Medtronic, Inc. et. al.</i> , No. 0:25-CV-00769-PJS-DLM, ECF No. 15 (Dist. Of Minn. March 19, 2025)
2003	Stipulation Extending Time For Defendants To Respond To Plaintiff's Complaint, <i>Moskowitz Family LLC v. Medtronic, Inc. et. al.</i> , No. 0:25-CV-00769-PJS-DLM, ECF No. 24 (Dist. Of Minn. May 22, 2025)
2004	First Amended Complaint, <i>Moskowitz Family LLC v. Medtronic, Inc. et. al.</i> , No. 0:25-CV-00769-PJS-DLM, ECF No. 27 (Dist. Of Minn. May 23, 2025)
2005	Stipulation to Amend Case Scheduling Concerning Contentions and Claim Construction, <i>Moskowitz Family LLC v. Medtronic, Inc. et. al.</i> , No. 0:25-CV-00769-PJS-DLM, ECF No. 42 (Dist. Of Minn. January 16, 2026)
2006	October 3, 2025 Update to USPTO Interim Director Discretionary Process
2007	March 24, 2025 Guidance on USPTO's rescission of "Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District court Litigation"

2008	USPTO FAQs for Interim Processes for PTAB Workload Management (Archived)
2009	Complaint, <i>Moskowitz Family LLC v. Zimvie Inc.</i> , No. 1:22-cv-01632-UNA, ECF No. 1 (D. Del. December 23, 2022)
2010	Information Disclosure Statement citing early publication of '755 great-great-great-grandparent U.S. 7,704,279 (U.S. App. Pub. No. 2006/0241621) in Medtronic/Warsaw U.S. Patent Application No. 12/326,682 (December 3, 2008)
2011	Information Disclosure Statement citing '755 great-grandparent U.S. 9,924,940 in Medtronic/Warsaw U.S. Patent Application No. 17/246,968 (May 3, 2021)
2012	Information Disclosure Statement citing '755 grandparent U.S. 10,251,643 in Medtronic/Warsaw U.S. Patent Application No. 17/307,706 (November 3, 2021)
2013	<i>Intentionally left blank</i>
2014	<i>Intentionally left blank</i>
2015	<i>Intentionally left blank</i>
2016	Amended Pretrial Scheduling Order, <i>Moskowitz Family LLC v. Medtronic, Inc. et. al.</i> , No. 0:25-CV-00769-PJS-DLM, ECF No. 44 (Dist. Of Minn. January 20, 2026)
2017	Complaint, <i>Moskowitz Family LLC v. Globus Medical, Inc.</i> , No. 6:19-cv-00672, ECF No. 1 (W.D. Tex. November 20, 2019)
2018	<i>Intentionally left blank</i>
2019	Complaint, <i>Moskowitz Family LLC v. Medtronic, Inc. et al.</i> , No.0:25-cv-00769, ECF No. 1 (Dist. Of Minn February 28, 2025)

2020	Letter from Michael Fink, Counsel for Nathan Moskowitz to Newton Metcalf Jr., Director of Advanced Technologies Program for Medtronic, Inc., dated June 30, 2015
2021	Letter from Michael Fink, Counsel for Nathan Moskowitz to Brad Lerman, Senior Vice President and General Counsel for Medtronic, Inc., dated June 30, 2015
2022	Attachments to Notice Letters including Moskowitz Patent Portfolio and U.S. Patent No. 9,005,293
2023	<i>Intentionally left blank</i>
2024	Uniloc USA, Inc. v. Motorola Mobility LLC, Case No. 2:16-CV-00992-JRG, ECF No. 125 (E.D. Tex. Apr. 5, 2017) (Gilstrap, J.)
2025	Declaration in Support of Jason M. Zucchi's Notice of Intent
2026	Declaration in Support of William R. Woodford's Notice of Intent
2027	Declaration in Support of Todd S. Werner's Notice of Intent
2028	Declaration in Support of Shelleaha L. Jonas's Notice of Intent
2029	Claim Construction Order, <i>Moskowitz Family, LLC v. NuVasive, LLC et. al.</i> , No. 1:25-CV-00711-WCB, ECF No. 83 (D. Del. June 29, 2026) (Bryson, W.)
2030	Transcript of Deposition of Mr. Culbert, 7-1-26
2031	Declaration of Ken Gall, Ph. D.
2032	Curriculum Vitae of Ken Gall, Ph. D.

I. INTRODUCTION

The Petition does not demonstrate that any asserted ground anticipates or renders obvious the challenged claims of the '755 patent. Across the asserted grounds, Petitioner fails to identify the coordinated structural and functional relationships required by the claims. Instead, the Petition assigns different claim limitations to overlapping portions of the same prior art structures, attributes functions to components that the references do not disclose, and relies on conclusory assertions that materially different implant and tool systems could be combined without adequately explaining the required modifications or why a POSITA would have expected the proposed combinations to succeed.

Ground 1 fails because Schäfer does not disclose several limitations of independent claims 1 and 12. The Petition identifies the contours of openings 22 in Schäfer's supporting ring as the claimed "tool-engagement surface," even though Schäfer describes those openings as merely structures that permit insertion of the tool and guide it as the tool accesses the rotating inner sleeves. The Petition also identifies Schäfer's supporting ring as part of the claimed "turning mechanism," despite Schäfer's disclosure—and Petitioner's expert's admission—that the supporting ring remains stationary while the inner sleeves rotate. The Petition further relies on overlapping portions of Schäfer's inner sleeves and supporting ring to satisfy separately recited components of claim 1. And it never shows that the

alleged expansion mechanism is coupled to the opposite shell surfaces identified in its own mapping. These deficiencies also defeat Grounds 2 and 3, which rely on the same mapping of Schäfer.

Grounds 4 through 6 fail for a different set of reasons. Yeh already discloses a complete implant-and-tool system. But because Yeh does not disclose the claimed actuation features, Petitioner proposes modifying Yeh to incorporate Berry's materially different, implant-specific instrumentation. The Petition does not provide a proper reason why a POSITA would have replaced Yeh's disclosed actuation arrangement with Berry's, what modifications would have been required to adapt Berry's specialized actuator interface to Yeh's adjustment ring, or why the resulting system would have been expected to operate successfully. Petitioner's expert conceded that modifications would "obviously" have been required, but neither the Petition nor his declaration identifies them.

The record also confirms that the proposed Yeh-Berry combination would present unresolved alignment, guidance, engagement, and retention problems. Petitioner's expert acknowledged that a toothed surgical instrument requires guidance to align and engage the corresponding implant structure in a confined surgical environment. Yet the Petition identifies no comparable guiding structure in the proposed combination and does not explain how Berry's tool would reliably engage Yeh's single circumferential row of tool holes. The Petition therefore does

not provide the reasoned technical analysis necessary to establish a motivation to combine or a reasonable expectation of success.

Even if the proposed Yeh-Berry combination could be implemented, it still would not disclose several claim limitations. The combination does not teach the claimed tool-engagement surface and associated engagement requirements, the separately recited components of the expansion mechanism, or the claimed rotating gear.

Petitioner's expert declaration does not cure these deficiencies. It largely repeats the Petition's mappings and conclusions without supplying the underlying engineering analysis. His deposition testimony instead confirms material gaps in Petitioner's theories, including that Schäfer's supporting ring does not rotate and that the proposed Yeh-Berry combination would require unidentified modifications and unresolved guidance.

Petitioner has therefore failed to prove that the asserted references disclose the claimed structural and functional relationships or that a POSITA would have combined the references in the proposed manner with a reasonable expectation of success. The Board should confirm the patentability of all challenged claims.

II. THE '755 PATENT

The '755 patent addresses a practical surgical problem: how to stabilize a portion of the spine using an implant that can be inserted between vertebrae in a

compact configuration and then expanded in situ to achieve secure fixation, without the bulk, rigidity, and surgical complications associated with traditional pedicle-screw constructs and anterior plating systems. *See* Ex. 1001; Ex. 2031¹ ¶¶ 35-38.

The specification explains that conventional fixation techniques can introduce excessive rigidity, prolonged surgical time, and risk of neurovascular injury. Ex. 1001, 2:20-27. In cervical procedures, protruding plates may even cause esophageal irritation. *Id.* at 2:45-65. The patent responds to these clinical realities by disclosing implant systems that secure fixation internally while maintaining a lower profile and reducing surgical morbidity. *Id.* at 6:58-7:9.

At the core of the invention is a coordinated mechanical relationship between opposing shell structures, an expansion mechanism positioned between them, and a tool that drives expansion through controlled rotation. *Id.* at Abstract. The implant is inserted between vertebrae in a compact, closed configuration. Once properly positioned, the surgeon actuates an expansion mechanism that converts rotational input from a tool into outward expansion. That expansion anchors the implant into opposing vertebral bodies above and below the device. *See, generally*, Ex. 1001; Ex. 2031 ¶¶ 39-40.

¹ Patent Owner submits a declaration (Ex. 2031) by Ken Gall, Ph. D, an expert in the field of medical implants and surgery. Ex. 2031 ¶¶ 6-13, 30-34.

The Figures and corresponding descriptions illustrate this principle. Figures 1A-1D show a compact implant body housing opposing left- and right-handed screw members. A tool applies rotational input to the expansion mechanism, which simultaneously drives the screws outward in opposite directions. Prior to actuation, the screws are contained within the implant body; after expansion, the screws extend outward and embed into vertebral structures, resisting migration and stabilizing the segment. The expansion is controlled, symmetrical, and mechanically linked to the tool's rotational input. *Id.* at 5:41-6:7; Ex. 2031 ¶ 41.

The expansion mechanism is a mechanical drive system that translates tool-driven rotation into bidirectional threaded movement. In Embodiment I (Figs. 1A–1D), the tool rotates a drive screw or pinion that drives an interposing gear arrangement, causing the opposing threaded screw members to extend simultaneously. Ex. 1001, 5:41-6:7. In Embodiment II (Figs. 2A–2G), a drive pinion engages left and right gears that independently rotate corresponding screw members. Ex. 2031 ¶ 43. In Embodiment III (Figs. 3A–3E), two separate drive pinions provide independent control over the opposing screw members. Ex. 1001, 6:21-37; Ex. 2031 ¶ 44. Across these embodiments, the common feature remains constant: rotational input from a tool is mechanically converted into controlled expansion of the implant components through an internal drive mechanism. Ex. 2031 ¶ 42.

The disclosure then expands this fixation principle into broader implant constructs. Figures 4A–4C illustrates one or more expandable screw devices spanning the space between vertebral bodies. One embodiment positions a single expandable screw anteriorly between two vertebrae, serving both as a stabilizer and as a barrier against cage extrusion. Another embodiment arranges three expandable screws in a triangulated configuration spanning anterior and middle spinal columns. This triangular placement prevents subsidence while leaving open space between the screws for bone graft or osteoinductive material to promote fusion. Ex. 1001, 6:38-57; Ex. 2031 ¶ 45.

Figures 5A–5D integrate expandable screws into a “zero-profile” horizontal linear mini-plate formed from upper and lower portions that interdigitate through alignment pins and recesses. The plate includes slots that receive the screws, which expand into the vertebral bodies after implantation to anchor the plate flush with, or recessed relative to, the vertebral surfaces, thus avoiding the protruding hardware of conventional anterior plates. Ex. 1001, 6:58-7:3; Ex. 2031 ¶ 46.

Figures 6A–6G disclose a triangular mini-plate working with multiple expandable screws, including a posterior screw, providing triangulated stabilization while maintaining a low profile. Figures 6H–6I disclose a hollowed “three-in-one” configuration in which the triangular plate functions as a cage capable of receiving bone graft material. In this unified device, functions traditionally divided among a

cage, a plate, and fixation screws are combined into a single implant that is inserted and then expanded to lock into the vertebral bodies. Ex. 1001, 7:4-21; Ex. 2031 ¶ 47.

Figures 7A–7B disclose an expandable intervertebral body fusion device (IBFD) having opposing shells capable of expansion. The shells include vertebral-engaging features, and the device may receive bone fusion material within its interior of the device and surrounding disc space. After placement, the shells expand against the adjacent endplates, and fixation members may extend into the vertebral bodies. Ex. 1001, 7:22-8:6; Ex. 2031 ¶ 48.

Claim 1 captures the coordinated mechanical relationships central to these embodiments. It recites first and second shells having vertebral-engaging surfaces, and an expansion mechanism positioned between the shells and coupled to their opposing surfaces. The expansion mechanism includes a tool-engagement surface and threaded components that translate rotational input into expansion. The claim further requires that rotating the tool about its longitudinal axis while the tool remains engaged with the tool-engagement surface causes rotation of a turning mechanism and expansion of the implant by an expansion mechanism. The shells may include cavities and circumferentially positioned engagement features, reinforcing fixation at vertebral interfaces. Ex. 2031 ¶ 49.

Thus, the claims are directed to a particular coordinated system of shells, an interposed expansion mechanism, and tool-driven rotational actuation that produces controlled, internal expansion to secure vertebral fixation within the confined spinal surgical environment. *Id.* at ¶¶ 50-51.

III. SUMMARY OF THE ASSERTED REFERENCES

The asserted references disclose expandable implants and associated instrumentation. But they employ mechanical architectures and actuation relationships that differ materially from the coordinated implant, expansion mechanism, and tool arrangement required by the challenged claims.

A. Schäfer (Ex. 1010)

Schäfer discloses a height-adjustable intervertebral implant formed from two coaxially arranged outer sleeves—an upper outer sleeve and lower outer sleeve—that define the load-bearing body of the device. Ex. 1010, Abstract, 2:13-23. Within the outer sleeves is a drive element comprising two inner sleeves. *Id.* at 2:24-29. Each inner sleeve has external threads that engage corresponding internal threads along the inner circumferences of the outer sleeves. *Id.* at 2:15-21. Rotation of the inner sleeves causes the outer sleeves to move axially apart, thereby increasing the implant's height. *Id.* at Figs. 1-2. Schäfer thus produces expansion through threaded movement between concentric sleeve components. Ex. 2031 ¶¶ 56-60.

Schäfer's inner sleeves rest upon a supporting ring positioned between them. *Id.* at 2:44-46. The ring includes openings that allow a tool to access and engage teeth formed on the inner sleeves, allowing the tool to rotate the inner sleeves to produce threaded advancement. *Id.* at 2:63-67, 3:11-15; Ex. 2031 ¶¶ 61-65. The outer sleeves terminate at surfaces 16, which face but do not couple with the supporting ring in the collapsed configuration. *Id.* at 4:38-41, Fig. 1. As the implant expands, those surfaces move axially.

B. Yeh (Ex. 1008)

Yeh describes a spinal column fixation device intended to stabilize spinal segments during treatment. Ex. 1008, Abstract. The device is organized around support members extending between a top seat and a bottom seat. *Id.* at ¶ 21. Each seat includes fixation teeth configured to engage adjacent spinal structures, allowing the assembly to secure relative to vertebral anatomy. *Id.*; Ex. 2031 ¶¶ 66, 71.

The support members incorporate a height-adjusting mechanism to vary the spacing between the top and bottom seats. Ex. 1008 ¶¶ 21, 26. In one embodiment, that mechanism includes an upper support body, a lower support body, and an adjustment ring positioned between them. *Id.* The adjustment ring contains internal threading that cooperates with gapped threaded teeth formed on the upper support body. *Id.* When the adjustment ring is rotated, the threaded interaction causes the upper support body to advance toward or retract from the lower support body,

thereby changing the overall height of the support member. *Id.* at ¶ 26. Yeh explains that the adjustment ring may include tool holes to permit rotational actuation by its tool. *Id.*; Ex. 2031 ¶¶ 67-70.

C. Berry (Ex. 1009)

Berry describes an adjustable vertebral implant assembly that expands after implantation. Ex. 1009 ¶¶ 18-19. The device includes a threaded tubular body 22 positioned between endplate assemblies 24 and 26. *Id.* at ¶ 19. Rotation of the tubular body causes endplate assemblies 24 and 26 to expand or contract via threaded engagement. *Id.* The tubular body includes multiple apertures 28, which serve both as installation/adjustment features and as openings that permit tissue ingrowth after placement. *Id.* at ¶¶ 19, 31, 34; Ex. 2031 ¶¶ 72-74.

To actuate the tubular body within the confined spinal surgical environment, Berry discloses an expander apparatus 50. Ex. 1009 ¶¶ 22-23. The expander includes a handle section 52 and a gearbox arrangement designed to transmit rotational input from the handle to a toothed section 86. *Id.* at ¶¶ 23, 25-26, 31. The toothed section 86 includes radially arranged teeth 93 sized and spaced to engage the apertures 28 in the tubular body 22. *Id.* at 31. As the toothed section rotates, successive teeth engage successive apertures, causing the tubular body to rotate and expanding the endplates. *Id.*; Ex. 2031 ¶¶ 75-79. Berry's tool does not maintain engagement with any particular aperture during rotation.

D. Suddaby (Ex. 1011)

Suddaby discloses a structurally simple expandable stent. Ex. 1011, 2:28-63. Suddaby explains that the stent may be made from titanium, steel, or any other readily available biocompatible material. *Id.* at 2:64-66; Ex. 2031 ¶ 80.

IV. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art (“POSITA”) at the time of the invention would have had a bachelor’s degree in mechanical engineering, biomechanical engineering, or similar discipline, and five years relevant industry experience relating to medical device design or manufacture; or a master’s degree in mechanical engineering, biomechanical engineering, or similar discipline, and either three years relevant industry experience relating to medical device design or manufacture and/or three years teaching at the collegiate level as a professor; or a doctorate in mechanical engineering, biomechanical engineering, or similar discipline; or a medical degree and residency training in neurosurgery or orthopedic surgery, and three to five years of post-residency spinal surgery and spinal instrumentation experience as a primary surgeon. Someone with less technical education but more experience, or more technical education but less experience, could also meet this standard. Ex. 2031 ¶ 32.

Petitioner’s definition of a POSITA is similar to Patent Owner’s, although slightly broader because it would include individuals with only general engineering

practice, rather than specialized medical-device or spinal-instrumentation experience, or advanced technical training. *Id.* at ¶ 33. Despite this difference, the arguments below apply under either definition.

V. CLAIM CONSTRUCTION

Except as addressed below, the terms of the '755 patent should be given their ordinary and customary meaning. Ex. 2031 ¶ 52.

A. Turning Mechanism

No construction of “turning mechanism” is necessary to resolve the issues in this proceeding. The term should be given its ordinary and customary meaning. Petitioner likewise proposes no construction and applies the term’s ordinary meaning. Pet. 22.

In the co-pending case *Moskowitz Family, LLC v. NuVasive, LLC and NuVasive Inc.*, No. 1:25-cv-0711-WCB, D. Del., the district court construed “turning mechanism” in a different but related patent to mean “a device that, when rotated, drives the expansion of a first shell with respect to a second shell.” Ex. 2029², at 22. That construction, however, rested on materially different surrounding claim

² Exs. 2029 and 1052 also construe other terms appearing in related patents. Patent Owner does not take a position on whether those constructions should apply here. Ex. 2031 ¶ 54.

language. Claim 22 of the patent at issue there (U.S. Pat. No. 9,924,940) expressly recites “a turning mechanism *configured to drive expansion* between the first shell and the second shell in response to turning the turning mechanism.” *Id.* at 19–20 (emphasis added).

Claims 1 and 12 of the ’755 Patent are different. They do not assign the expansion-driving function to the turning mechanism alone. Instead, they recite an expansion mechanism comprising a turning mechanism and other components, and they assign the expansion-related functionality to the expansion mechanism as a whole.

Importing the *NuVasive* construction into the ’755 claims would therefore shift a function expressly assigned to the expansion mechanism onto only one of its constituent components. That would disregard the different language chosen for these claims. *See CAE Screenplates Inc. v. Heinrich Fiedler GmbH*, 224 F.3d 1308, 1317 (Fed. Cir. 2000) (“In the absence of any evidence to the contrary, we must presume that the use of these different terms in the claims connotes different meanings.”); *Merck & Co. v. Teva Pharm. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) (“A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”).

B. Means for Placement of a Bone Fusion Material

Petitioner contends that claim 10's "means for placement of a bone fusion material" is governed by 35 U.S.C. § 112 ¶ 6 and identifies the corresponding structure as an elastomeric sheath. Pet. 22-23. Petitioner does not challenge claim 10 under that construction. Alternatively, Petitioner acknowledges that the corresponding structure may also include "an orifice in the implant that can receive a bone fusion material" based on the specification's disclosure that "bone fusion substances are placed/packed or poured, into the inner aspects of the device 700 and its surrounding intervertebral space." *Id.* (citing Ex. 1001, 7:52-55).

If the Board concludes that the limitation is subject to 35 U.S.C. § 112 ¶ 6, the corresponding structure is not limited to an elastomeric sheath. The specification discloses additional structures that perform the claimed function "for placement of a bone fusion material."

As Petitioner acknowledges, the specification identifies the "inner aspects" of the expandable device and its surrounding intervertebral space as locations for receiving bone fusion material. Ex. 1001, 7:52-55. It further explains that, after placement of a BDFT mechanism, "[t]he inside of the denuded intervertebral space can then be packed with autologous or allograft bone, BMP, DBX or similar osteoinductive material," or "an intervertebral spacer filled with either of these substances can be inserted." Ex. 1001, 3:4-20; 9:35-47.

The corresponding structure therefore includes not only an elastomeric sheath, but also the inner spaces of an expandable device, the surrounding intervertebral space, an intervertebral spacer configured to receive bone fusion material, and any equivalents of those structures. *See* Ex. 2031 ¶ 53.

VI. GROUND 1: SCHÄFER FAILS TO ANTICIPATE CLAIMS 1, 8, 10-12, AND 17-19.

Petitioner's anticipation theory depends on mappings that do not align with either the claim language or Schäfer's disclosure. The Petition repeatedly assigns multiple claim limitations to overlapping portions of the same structures, attributes functions to Schäfer's components that Schäfer does not disclose, and fails to account for the structural relationships the claims expressly require. Those defects are dispositive. The Petition does not establish that Schäfer discloses (1) a turning mechanism whose rotation is caused by rotation of the tool, (2) the claimed tool-engagement surface, (3) the separately recited structural components recited of the expansion mechanism, (4) an expansion mechanism coupled to the particular opposite shell surfaces identified in Petitioner's own mapping, or (5) claim 11's requirement that the turning mechanism engage the threads of the threaded body. Because Grounds 2 and 3 rely on the same mapping of Schäfer, they likewise fail.

A. The Petition Fails to Establish that Schäfer Discloses Claim 1's Requirement that "Rotating of the Tool Causes a Rotation of the Turning Mechanism."

Claim 1 requires an expansion mechanism comprising a turning mechanism and further requires that "rotating of the tool causes a rotation of the turning mechanism." Ex. 1001, 10:59-11:6. Petitioner identifies the alleged turning mechanism as comprising both Schäfer's bevel teeth 26 on inner sleeves 34 and 36 *and* supporting ring 18. Pet. 30, 33. But Schäfer consistently describes supporting ring 18 as stationary. The Petition therefore does not explain how tool rotation could cause rotation of the alleged turning mechanism that Petitioner itself has identified.

Petitioner asserts that tool 70 engages opening 22 and is "turned in the supporting ring" so that tool teeth 72 engage and rotate inner sleeve teeth 26 and rotate inner sleeves 34 and 36. Pet. 33. At most, this describes the tool rotating within supporting ring 18 while driving rotation of *the inner sleeves*. It does not establish that tool rotation causes rotation of Petitioner's alleged turning mechanism, which expressly includes the supporting ring 18.

Schäfer confirms that supporting ring 18 does not rotate. It describes the inner sleeves as being "rotatably driven *with respect to* the supporting ring." Ex. 1010, Abstract, 6:12-14, 7:6-7 (emphasis added). Supporting ring 18 thus provides the stationary reference structure relative to which the inner sleeves rotate. Ex. 2031 ¶¶ 83-87. Petitioner's expert agreed. He testified that supporting ring 18 does not rotate

during expansion and remains “generally in the exact same spot.” Ex. 2030, 99:10-14.

That testimony is irreconcilable with Petitioner’s mapping. Under Petitioner’s theory, supporting ring 18 is part of the claimed turning mechanism. But a stationary reference structure cannot also be part of the mechanism whose rotation must be caused by rotation of the tool.

Petitioner’s description of Schäfer’s operation reinforces the point. Petitioner emphasizes that Schäfer’s tool 70 “does not need to be reinserted after each rotational turn of inner sleeves 34, 36.” Pet. 33. That operation is consistent with a tool rotating within an opening in a stationary supporting ring while driving rotation of the inner sleeves. Ex. 2031 ¶¶ 88-89. It is not consistent with rotation of supporting ring 18 itself. Tool rotation therefore does not cause rotation of the structure Petitioner identifies as the turning mechanism. *Id.* at ¶¶ 90-91.

This is not a semantic distinction. Claim 1 requires a specific actuation relationship: rotation of the tool must cause rotation of the turning mechanism within the expansion mechanism. Schäfer instead discloses inner sleeves rotating within a concentric threaded assembly while supporting ring 18 remains stationary and the outer sleeves translate axially. The Petition does not show that this arrangement satisfies the claimed relationship.

Mr. Culbert’s declaration does not cure this deficiency. It repeats the Petition’s mapping without explaining how a turning mechanism that includes stationary supporting ring 18 can satisfy the requirement that the tool cause the turning mechanism to rotate. *Compare* Pet. 30, 33 with Ex. 1002 at pp. 52, 55 (Appendix A). Such conclusory testimony is entitled to little weight. 37 C.F.R. § 42.65(a); *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 (PTAB Aug. 24, 2022) (precedential).

His deposition testimony instead confirms the defect. Asked which Schäfer structures rotate in response to turning of the tool, Mr. Culbert identified “[t]he threaded bodies, 34 and 36,” including teeth 26. Ex. 2030, 96:2-6. Asked whether supporting ring 18 rotates during expansion, he answered: “No, it doesn’t.” *Id.* at 99:10-14.

Because Schäfer does not disclose that rotation of the tool causes rotation of the turning mechanism identified by Petitioner, Schäfer does not anticipate claim 1. Ex. 2031 ¶ 198.

B. Schäfer’s Guide Openings Are Not the Claimed “Tool-Engagement Surface.”

Claims 1 and 12 require an expansion mechanism comprising a “tool-engagement surface” positioned and configured to be engaged by a tool extending along a direction of insertion. The claims further require expansion “in response to rotating of *a tool engaged with the tool-engagement surface*, wherein rotating the

tool comprises rotating the tool about a longitudinal axis of the tool *while the tool is engaged with the tool-engagement surface.*” The tool therefore must remain engaged with the claimed tool-engagement surface during the rotational actuation that expands the implant. *See* Ex. 2031 ¶ 92.

The Petition identifies “the contours of opening 22” in supporting ring 18 as that surface. Pet. 30, 44. But Schäfer describes openings 22 as access and guide features, not as structures that interact with the tool during expansion. Schäfer explains that openings 22 “allow insertion of the tool into the supporting ring,” permit the tool “to move it to the front surface of the inner sleeve,” and “guide and support the tool.” Ex. 1010, col. 2:63-67. Figure 8 likewise shows the openings 22 extending through supporting ring 18 to provide access to the implant’s interior. *Id.*, Fig. 8.

Dr. Gall explains that a POSITA would therefore understand openings 22 as guide and access features, not as the claimed tool-engagement surface. Ex. 2031 ¶¶ 93-98. The fact that the tool passes through, or may incidentally contact, the openings does not make their contours the surface with which the tool remains engaged during rotation. *Id.* Rather, the openings would be dimensioned to provide access to the operative interface while permitting the tool to rotate freely and engage the operative teeth on the inner sleeves. *Id.* (citing Ex. 1010, 2:63-67, 4:29-30).

Petitioner’s expert agreed that easy rotation within the openings would be a design objective. Ex. 2030, 93:8-15 (“turning easily is definitely a...desired consideration when designing the tool.”). That testimony is consistent with a guide opening that permits rotation, not a surface that remains engaged during tool rotation.

Dr. Gall further explains that substantial frictional or interference engagement between the tool and openings 22 would be undesirable. It would increase the torque required to rotate the tool, reduce tactile feedback to the surgeon, and impede smooth adjustment of the implant. Ex. 2031 ¶¶ 95-96. A POSITA would thus understand Schäfer’s statement that openings 22 “guide and support” the tool as describing alignment and access, not mechanical engagement with the supporting ring during tool rotation. *Id.*

Neither the Petition nor Mr. Culbert’s declaration address this distinction. The Petition never explains why openings that Schäfer characterizes as insertion and guide structures constitute the claimed tool-engagement surface. Ex. 1010, 2:63-67; 3:11-25; 5:41-57. Nor does it explain how the tool remains engaged with the contours of openings 22 *while* rotating, as claims 1 and 12 require. *Id.*

Mr. Culbert’s declaration simply repeats the Petition’s mapping. *Compare* Ex. 1002 ¶¶ 39-41, *with* Pet. 33-34. It does not identify any operative engagement

between the tool and openings 22 or explain how the tool remains engaged with those openings during rotation and expansion of the mechanism.

His deposition testimony underscores the deficiency. Mr. Culbert characterized a “tool-engagement surface” as merely “a surface of the expansion mechanism that the tool contacts,” but he offered no limiting principle distinguishing operative engagement from incidental contact. Ex. 2030, 71:9-73:16. When asked whether any contacted surface could qualify, he testified that he had not analyzed the issue. Ex. 2030, 73:9-16, 77:6-17.

He likewise testified that claim 1 “doesn’t specify exactly when” contact with the alleged surface must occur. *Id.* at 72:12-17. The claim language says otherwise. Expansion must occur “in response to rotating of a tool engaged with the tool-engagement surface,” and the tool must rotate “while the tool is engaged with the tool-engagement surface.” Ex. 1001, claims 1, 12. Mr. Culbert’s interpretation reads the required engagement during rotation out of the claims.

Because Schäfer discloses openings 22 as guide and access structures, and Petitioner does not establish that the tool remains engaged with their contours during rotation, Schäfer does not disclose the claimed tool-engagement surface of claims 1 and 12. Ex. 2031 ¶ 198.

C. The Petition Fails to Establish That Schäfer Discloses an Expansion Mechanism Comprising a Distinct Tool-Engagement Surface, Threaded Body, and Turning Mechanism as Required By Claim 1.

Claim 1 recites an “expansion mechanism comprising a tool-engagement surface, a threaded body, and a turning mechanism.” Ex. 1001, 10:59-61. The separate recitation of those elements indicates that they correspond to distinct components. *See Becton, Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (“Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct components.”); *see also Magnolia Med. Techs., Inc. v. Kurin Inc.*, 169 F.4th 1094, 1103-04 (Fed. Cir. 2026).

The surrounding claim language reinforces that distinction by assigning each component different structural characteristics and functional relationships. The threaded body has “a first end, a second end, and a longitudinal axis extending in a direction from the first shell to the second shell.” Ex. 1001, claim 1. The tool separately engages the tool-engagement surface, and rotation of that tool must cause rotation of the turning mechanism. *Id.* These differing characteristics and relationships give each recited component independent significance. Ex. 2031 ¶¶ 99-100.

Claim 1 therefore cannot be satisfied by a mapping that collapses these separately recited components in a manner that eliminates their independent

structural and functional roles. *Becton, Dickinson*, 616 F.3d at 1257. Although a single structure may in some circumstances satisfy more than one claim limitation, Petitioner must still show that its mapped structures satisfy each limitation and the distinct relationships the claim requires.

Petitioner does not make that showing. It identifies supporting ring 18—and specifically the “contours of opening 22”—as the claimed “tool-engagement surface.” Pet. 30. It identifies inner sleeves 34 and 36 as the “threaded body.” *Id.* But it then defines the “turning mechanism” as comprising both bevel teeth 26 on those same inner sleeves 34 and 36 and supporting ring 18. Pet. 30-31.

Petitioner’s mapping thus uses inner sleeves 34 and 36 as both the threaded body and part of the turning mechanism. It likewise uses supporting ring 18 as both the structure containing the alleged tool-engagement surface and part of the turning mechanism. Yet the Petition neither acknowledges these overlaps nor explains how the same components satisfy the distinct structural and functional relationships assigned to the separately recited claim elements.

That omission is dispositive. As explained above, supporting ring 18 remains stationary and therefore cannot participate in the rotation required of Petitioner’s alleged turning mechanism. And bevel teeth 26 are formed on the same inner sleeves that Petitioner identifies as the threaded body. Petitioner cannot establish anticipation merely by assigning different labels to overlapping portions of Schäfer’s

components without showing that Schäfer actually discloses the distinct components and relationships required by claim 1.

Schäfer does not disclose separate structures corresponding to the claimed tool-engagement surface, threaded body, and turning mechanism as those components are arranged and related in claim 1. *See* Ex. 2031 ¶¶ 101-105. Anticipation turns on what Schäfer discloses—not on whether Petitioner can redistribute claim labels and functions among overlapping portions of Schäfer’s existing components. Petitioner therefore has not established that Schäfer discloses the expansions mechanism required by claim 1. *Id.* at ¶ 198.

D. Schäfer Does Not Disclose An “Expansion Mechanism Coupled to the First Opposite Surface and the Second Opposite Surface” as Required by Claims 1 and 12.

Claims 1 and 12 require an expansion mechanism positioned between the shells and “coupled to the first opposite surface and the second opposite surface.” Once Petitioner identified particular structures as the claimed opposite surfaces, it was required to show that the alleged expansion mechanism is coupled to those specific surfaces.

The Petition identifies inner sleeves 34 and 36, supporting ring 18, and locking element 42 as the claimed expansion mechanism. Pet. 28-30, 43-44. It separately identifies surface 16 of upper outer sleeve 12 as the first opposite surface and surface 16 of lower outer sleeve 14 as the second opposite surface. Pet. 25, 27. The Petition

therefore had to establish a structural connection between the alleged expansion mechanism and those two planar end *surfaces*. It never does.

Petitioner advances two theories. Neither satisfies the claim language. First, Petitioner relies on the threaded engagement between external threads 50 of inner sleeves 34 and 36 and internal threads 46 of outer sleeves 12 and 14. From that engagement, it concludes that “the opposite surfaces 16 of outer sleeves 12, 14 are coupled to the inner sleeves 34, 36.” Pet. 29-30. Petitioner’s expert repeats that language *verbatim*. Ex. 1002, at 52.

But the cited disclosure establishes only that the inner sleeves are threaded to the cylindrical interiors of the outer sleeves. Ex. 1010, 2:15-21, 5:8-22, Fig. 3. Neither the Petition nor Mr. Culbert explains why a threaded connection to one portion of an outer sleeve establishes coupling to the particular planar end surfaces 16 that Petitioner identifies as the claimed opposite surfaces.

Figure 3 illustrates the distinction. Threads 46 and 50 extend along the cylindrical interiors of outer sleeves 12 and 14. Surfaces 16 are planar end faces oriented perpendicular to those threaded interfaces. Ex. 1010, Fig. 3. Petitioner identifies no component of the alleged expansion mechanism that is coupled to those faces.

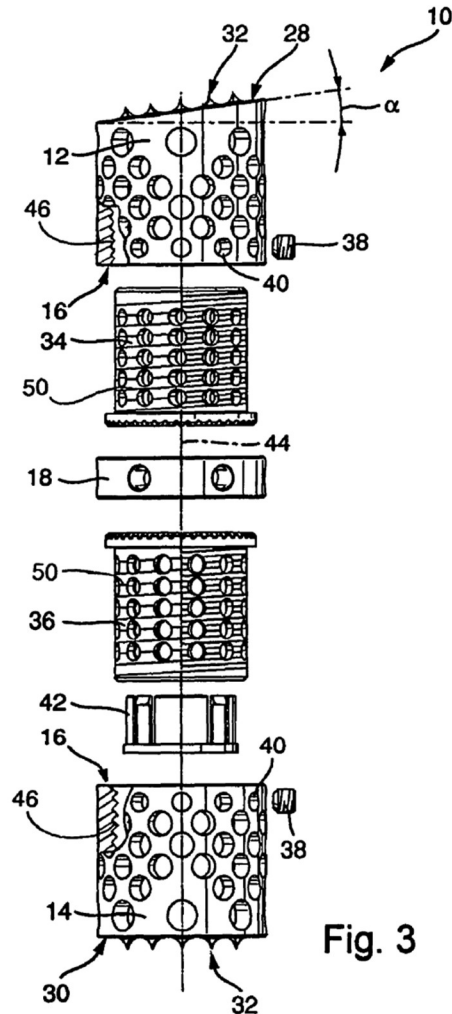


Fig. 3

Ex. 1010, Figure 3

Figures 1 and 2 reinforce that distinction. During expansion, the inner sleeves rotate while the outer sleeves, including surfaces 16, translate axially. Mr. Culbert confirmed that surfaces 16 do not touch any other component when the implant is expanded. Ex. 2030, 114:11-15.

Dr. Gall likewise explains that, although the threaded interfaces mechanically connect the inner and outer sleeves, a POSITA would not understand that connection to establish a structural coupling to a separately identified planar surface of the outer

sleeves. Ex. 2031 ¶¶ 106-111. Petitioner’s conclusion that the alleged opposite surfaces are therefore “coupled” simply assumes the very point is must prove.

Petitioner’s second theory relies on Schäfer’s statement that surfaces 16 “rest against” supporting ring 18 when the implant is collapsed. Pet. 30 (citing Ex. 1010, 4:38–41). Petitioner again offers no technical analysis, and Mr. Culbert merely repeats the Petition’s assertion. Ex. 1002 at 52.

His deposition testimony instead undermines the theory. Mr. Culbert testified that he understood “coupled” to mean “fixed” or “attached,” and agreed that surfaces 16 rest against supporting ring 18 only when the implant is fully collapsed. Ex. 2030, 114:1-4, 115:21-117:9. Even assuming supporting ring 18 is part of the expansion mechanism, temporary contact in a single configuration does not establish that surfaces 16 are fixed, attached or otherwise structurally coupled to the ring. Figure 2 shows those surfaces moving axially away from supporting ring 18 during expansion.

Dr. Gall confirms that a POSITA would not understand such temporary contact, without more, to establish a structural connection sufficient to meet the claims’ “coupling” requirement. Ex. 2031 ¶¶ 112-117. The Petition identifies no direct or indirect structural path connecting the alleged expansion mechanism to the specific opposite surfaces selected in its mapping.

Petitioner's two theories therefore rest on unsupported assumptions. First, that a threaded connection to one portion of the outer sleeves necessarily establishes coupling to a separately identified *surface* of those sleeves. And second, that temporary contact between surfaces 16 and supporting ring 18 satisfies the claimed coupling. Neither establishes that Schäfer discloses an expansion mechanism coupled to the first and second opposite surfaces as required by claims 1 and 12. *Id.* at ¶ 198.

E. Dependent Claims 8 and 10 are Patentable Over Schäfer.

Claims 8 and 10 are patentable over Schäfer for at least the reasons discussed above with respect to independent claim 1, from which they depend. *Id.*

F. Dependent Claim 11 is Further Patentable Over Schäfer Because Schäfer's Alleged Turning Mechanism Does Not Engage the Threads of the Threaded Body.

Claim 11 depends from claim 1 and is patentable over Schäfer for at least the same reasons discussed above. Claim 11 further requires that “the turning mechanism engages threads of the threaded body.” The Petition likewise fails to establish that additional relationship.

Petitioner identifies inner sleeves 34 and 36, together with locking mechanism 42, as the claimed “threaded body.” Pet. 30. It separately identifies bevel teeth 26 and supporting ring 18 as the claimed “turning mechanism.” Pet. 30-31. The Petition then asserts that the turning mechanism engages the threads of the threaded body

because teeth 26 “carry out the screwing motion.” *Id.* at 31. That assertion does not satisfy the claim language.

No portion of Petitioner’s alleged turning mechanism engages threads 50 of the alleged threaded body. Supporting ring 18 does not engage the threads, and Petitioner does not contend otherwise. Bevel teeth 26 do not engage threads 50 either. Rather, teeth 26 and threads 50 are formed *on* the same inner sleeves 34 and 36 that Petitioner identifies as the threaded body. Petitioner therefore does not identify any one structure engaging the threads of another. It relies on one feature of the alleged threaded body—bevel teeth 26—to satisfy the separate requirement that the turning mechanism engage the threads of that threaded body.

Schäfer’s operation confirms the distinction. Tool teeth 72 engage bevel teeth 26 to transmit rotational input to inner sleeves 34 and 36. Ex. 1010, 3:21-25, 5:45-54; Ex. 2030, 91:4-17. Eternal threads 50 on those inner sleeves, in turn, engage internal threads 46 of the outer sleeves 12 and 14 to convert rotation into axial expansion. Ex. 1010, 2:15-21, 5:8-22. Mr. Culbert confirmed that relationship. When asked whether any structures other than the threads of the outer sleeves and surfaces 16 engage threads 50 during expansion, he answered: “I believe those are the only structures that engage 50 during expansion.” Ex. 2030, 101:23-102:3. His testimony thus confirms that neither supporting ring 18 nor bevel teeth 26 engage threads 50.

Petitioner’s reliance on Schäfer’s statement that teeth 26 “carry out the screwing motion” does not fill this gap. That statement explains only that torque transmitted through teeth 26 ultimately causes the threaded expansion mechanism to operate. It does not disclose that the turning mechanism itself engages the threads of the threaded body, as claim 11 requires. *See* Ex. 2031 ¶¶ 118-126, 198.

G. Dependent Claims 17-19 are Patentable Over Schäfer.

Claims 17, 18, and 19 depend from claim 12 and are patentable over Schäfer for at least the same reasons discussed above. *Id.* at ¶ 198.

VII. GROUND 2: SCHÄFER IN VIEW OF YEH FAILS TO RENDER CLAIMS 2-6 OBVIOUS.

Ground 2 addresses only the additional limitations of dependent claims 2-6. It does not remedy the deficiencies in Petitioner’s mapping of independent claim 1 under Ground 1. Ground 2 therefore fails for at least the same reasons discussed above with respect to Ground 1.

Ground 2 also independently fails as to claim 5. Claim 5 requires that “the second shell curves continuously around a perimeter of the second shell.” Rather than address that limitation, Petitioner incorporates its Ground 1 analysis of claim 18. Pet. 55. But claim 18 concerns a different limitation: whether “the first shell curves continuously around a first perimeter of the first shell.” Pet. 45-46. Petitioner’s discussion of the first shell does not establish that the proposed Schäfer-Yeh combination discloses the separately claimed curvature of the second shell. Ex.

2031 ¶ 127. Because the Petition never identifies where the combination teaches or suggests that additional limitation, Petitioner has not carried its burden for claim 5. *Id.* at ¶ 198.

VIII. GROUND 3: SCHÄFER IN VIEW OF SUDDABY FAILS TO RENDER CLAIMS 9 AND 20 OBVIOUS.

Petitioner relies on Suddaby only to supply the additional limitation of dependent claims 9 and 20 requiring that “the first shell and the second shell each comprise titanium.” Pet. 55-56. Ground 3 otherwise relies on the same mapping of Schäfer advanced in Ground 1 and does not remedy any of the deficiencies discussed above. Ex. 2031 ¶ 128. Ground 3 therefore fails for at least the same reasons as Ground 1.

Ground 3 independently fails because Petitioner has not established that a POSITA would have been motivated to combine Suddaby with Schäfer. Suddaby discloses a structurally “simple” endoprosthesis comprising two telescoping elements with endplates and describes that devices as “easy to manufacture from common materials.” *See* Ex. 1011, at 2:26-33; Ex. 2031 ¶ 129. That straightforward design bears little resemblance to Schäfer’s more complex concentric-sleeve mechanism. Ex. 2031 ¶ 129. Suddaby’s statement that its own device is easy to manufacture therefore provides no reason to modify Schäfer’s materially different structure.

Suddaby also provides no reason to select titanium for Schäfer. It does not identify titanium as preferred. Instead, Suddaby broadly teaches that its stent may be formed from “titanium or steel, or any other readily available biocompatible material already in use for human implantation.” Ex. 1011, 2:64-66. The Petition does not explain why a POSITA would have selected titanium, rather than steel or another disclosed biocompatible material, for Schäfer’s specific device. Petitioner relies instead on generalized evidence that titanium was suitable for implantable devices. But evidence that titanium was generally known and suitable does not itself explain why a POSITA would have selected titanium from Suddaby’s list of alternatives for use in Schäfer’s particular mechanism. Ex. 2031 ¶ 130. Because Petitioner identifies no reference-specific reason to make that selection, it has not established a motivation to combine Suddaby with Schäfer. *Id.* at ¶ 198.

IX. GROUND 4: YEH IN VIEW OF BERRY FAILS TO RENDER CLAIMS 1-4, 8, 10-12, AND 17 OBVIOUS.

Ground 4 fails to render obvious claims 1-4, 8, 10-12, and 17 for several independent reasons. First, Petitioner’s asserted motivation to combine Yeh with Berry is driven by hindsight rather than by the teachings of the references. Yeh already discloses an implant and corresponding actuation arrangement. The Petition turns to Berry only because Yeh does not disclose the particular actuation features recited in the challenged claims. Second, the Petition identifies no persuasive reason why a POSITA would have replaced or redesigned Yeh’s actuation arrangement

using Berry's materially different, implant-specific instrumentation. Third, the Petition does not explain the proposed combination. It fails to identify the engineering modifications necessary to adapt Berry's tool and engagement interface to Yeh's adjustment ring and implant geometry. Fourth, the Petition does not establish a reasonable expectation that the proposed combination would operate successfully. It does not address the alignment, guidance, engagement, retention, and torque-transfer issues presented by combining the two systems.

Ground 4 also fails because the proposed Yeh-Berry combination does not teach or suggest several limitations of the challenged claims. It does not disclose the claimed rotating gear, an expansion mechanism comprising the separately recited structural components required by the claims, or the claimed tool-engagement surface and associated engagement relationships.

Each of these deficiencies independently prevents Petitioner from carrying its burden as to claims 1-4, 8, 10-12, and 17.

A. Petitioner Does Not Establish a Motivation to Combine Yeh with Berry.

Petitioner's motivation-to-combine theory assumes that Berry's actuation architecture could simply be substituted for Yeh's. But the relevant question is not whether the references could be combined in the abstract. It is whether a POSITA would have been motivated to abandon Yeh's integrated implant and instrumentation

architecture and to redesign it using Berry's materially different actuation system for a reason grounded in the prior art rather than in the challenged claims.

The Petition does not make that showing. It asserts that Berry's tool offers certain surgical advantages and then assumes that a POSITA would have selected Berry's particular actuation architecture for use with Yeh. Pet. 68-71. That skips the critical analytical step. The Petition does not explain why a POSITA would have modified Yeh in the specific manner proposed, rather than retaining Yeh's disclosed architecture or pursuing one of numerous alternative instrumentation designs.

As discussed below, Petitioner's theory has two related defects. First, its rationale for selecting Berry's actuation architecture is driven by the claim limitations rather than by the teachings of Yeh or Berry. Second, the Petition does not explain how Berry's specialized instrumentation would be adapted to Yeh's materially different implant architecture or why a POSITA would have reasonably expected the resulting system to operate successfully. Because Petitioner has not identified a sufficient reason to make the proposed modification or shown that the modification would have been expected to succeed, it has not carried its burden of establishing that Yeh and Berry render obvious claims 1-4, 8, 10-12, and 17.

1. Petitioner's Yeh-Berry combination is driven by hindsight.

Petitioner does not identify a proper reason why a POSITA would have modified Yeh's implant to use Berry's specialized expansion tool. Ex. 2031 ¶ 131.

Yeh already discloses a complete actuation system: a tool is inserted into tool holes 131 to rotate adjustment ring 130 and thereby adjust the implant's height. Ex. 2031 ¶¶ 132-137.

Despite acknowledging that Yeh already teaches a tool for actuating implant expansion, Petitioner turns to Berry for a different tool. Its reason is explicit: “Yeh does not disclose the specific design of the tool,” while “Berry...discloses a tool that satisfies limitation [1.g].” Pet. 66–67. That is not a technological reason to modify Yeh. It is an admission that Petitioner selected Berry because Berry allegedly supplies a claim limitation missing from Yeh. Such claim-driven reconstruction is not a proper motivation to combine.

The Petition identifies no defect, reliability concern, manufacturing issue, surgical-access problem, or performance limitation in Yeh's disclosed actuation architecture that would have motivated a POSITA to replace it. Ex. 2031 ¶ 135. Instead, Petitioner relies on criticisms and asserted advantages drawn from Schäfer and Berry without tying them to Yeh's tool. Pet. 69-71.

That reasoning is particularly deficient because Petitioner acknowledges that Yeh does not disclose the specific design of its tool. Pet. 66-67. Having made that acknowledgment, Petitioner cannot attribute to Yeh alleged shortcomings derived from different tools disclosed in other references. Ex. 2031 ¶¶ 138-141. The Petition's after-the-fact catalogue of undesirable features—without evidence those

features were present in Yeh—reflects hindsight, not a reason grounded in Yeh’s disclosure.

Yeh’s own disclosures further undermines Petitioner’s rationale. Petitioner argues that tools requiring reinsertion after a quarter turn, or substantial lateral movement, would be difficult or impossible to use in many surgical procedures. Pet. at 69. But Yeh does not disclose either characteristic.

Yeh’s upper support body 120 is divided into four upper support legs 121, with four corresponding gaps between them. Ex. 1008, Figs. 2-3, 5a-5b, 6a-6b; ¶¶ 21, 26; Ex. 2031 ¶¶ 142-146. A POSITA would have understood that those gaps provide space for Yeh’s tool to project inward while engaging tool holes 131 and permit limited rotation without interfering with axial movement of the implant. Ex. 2031 ¶ 144.

The support legs themselves constrain that rotational movement. Because the tool rotates only within the small gaps between adjacent legs, its lateral movement would be substantially less than a quarter turn—for example, less than one-eighth of a turn given the four legs and four gaps. *Id.* at ¶¶ 145-146. Petitioner’s assertions that Yeh’s arrangement would require enlarged lateral movement, a larger wound, or increased labor and surgical time therefore are not supported by Yeh’s disclosure. *Id.*

After attributing unsupportable shortcomings to Yeh, Petitioner simply substitutes Berry's specialized tool into Yeh's implant. Pet. 70. This is the type of hindsight reconstruction that § 103 prohibits. Rather than explain why a POSITA, at the time of the invention, would have modified Yeh in the proposed manner, Petitioner starts with the challenged claims and works backward to assemble their limitations from separate references. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007).

The Federal Circuit rejected materially similar reasoning in *ActiveVideo Networks, Inc. v. Verizon Communications, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012). There, the court held that conclusory assertions about combining supposedly modular components did not supply the required explanation of how or why the references would have been combined.

Petitioner commits the same error here. It treats Yeh's adjustment mechanism and Berry's expander tool as interchangeable modules because Berry allegedly supplies claim language missing from Yeh. But the Petition does not show that a POSITA would have regarded the two systems as interchangeable, identify a technological reason to replace Yeh's tool arrangement, or explain why a POSITA would have selected Berry's specialized instrument over Yeh's disclosed actuation system or other available designs.

The Petition therefore has not established a legally sufficient motivation to combine Yeh and Berry.

2. Yeh and Berry disclose fundamentally different implant and tool designs

The Petitioner treats Berry's expansion tool as a generic surgical instrument that could simply replace Yeh's disclosed adjustment arrangement. But spinal implant instrumentation is not developed in the abstract. A POSITA would have understood that the tool, the implant-side engagement structure, the implant's geometry and kinematics, and the constraints of the surgical anatomy must operate together as an integrated system. Ex. 2031 ¶¶ 36-37, 148. The tools disclosed in Yeh and Berry therefore would not have been viewed as interchangeable merely because both are used with expandable spinal implants. *Id.* at ¶¶ 147-155.

Yeh reflects this integrated design. Its implant expands through tool engagement with tool holes 131 formed in adjustment ring 130. Rotation of the ring relative to upper support body 120 changes the implant's height. Yeh thus discloses not a generic or universal expansion driver , but an implant-side interface and corresponding actuation arrangement configured to work together. Ex. 2031 ¶¶ 132-137.

Dr. Gall explains that Yeh's tool operates like a lever, using the tool holes 131 as mechanical contact points. *Id.* at ¶ 133. As the handle moves in one direction, the tool tip moves in the opposite direction within the implant. *Id.* ¶ 144. Yeh's

geometry accommodates that motion. Upper support body 120 includes interrupted threaded teeth 122 separated by distinct gaps, rather than continuous threads. *Id.* at ¶ 142. A POSITA would have understood that those gaps provide the path needed for the tool to engage and rotate adjustment ring 130 while allowing the upper support body to translate axially. *Id.* at ¶¶ 143-145. Yeh's adjustment mechanism is therefore a coordinated implant-and-instrument design whose geometry reflects its intended manner of surgical actuation. *Id.* at ¶¶ 142-146.

Berry discloses a materially different implant-specific system. Its expander is not a generic rotational driver capable of actuating any expandable implant. *Id.* at ¶¶ 147, 153, 155. Berry's C-shaped engager carries teeth configured to mate with apertures in Berry's tubular body, while a geared transmission converts rotation of the instrument into rotation of that body. *Id.* at ¶¶ 149-151. The geometry, spacing, and engagement relationship between Berry's tool and implant are interdependent. Berry's asserted advantages—including rotation about the tool's longitudinal axis and reduced lateral movement—result from that integrated architecture, not from a universally applicable tool concept. *Id.* ¶¶ 152-154.

The differences between Yeh's and Berry's implant-tool systems extend well beyond tool shape. In Yeh, the tool engages holes in adjustment ring 130 and applied torque directly to that ring, which rotates to translate upper support body 120 axially while the lower support body remains fixed. In Berry, a C-shaped engager carrying

teeth meshes with apertures in a central tubular body, and a geared transmission rotates that body while opposing endplate assemblies move apart. The systems thus use different engagement interfaces, torque-transfer paths, moving components, and implant geometries.

Those differences matter to the proposed combination. Each reference discloses an integrated implant-tool system in which the instrument, the engagement structure, and implant geometry are designed to function together. Ex. 2031 ¶¶ 147-155. A POSITA therefore would not have regarded Berry's specialized expander tool as a substitute for Yeh's adjustment arrangement. *Id.* Adapting Berry's instrumentation to Yeh would require substantially more than exchanging one surgical instrument for another. It would require redesigning the interface between the instrument and the implant.

3. Petitioner does not explain how Berry's instrumentation would be adapted to Yeh's different implant architecture.

Having assumed that a POSITA would have selected Berry's expansion tool for use with Yeh, the Petition simply concludes that the combination would work. It never explains how Berry's implant-specific instrumentation would be adapted to Yeh's materially different adjustment architecture. Instead, the Petition moves directly from a desired result—that Berry's tool allegedly satisfies the claimed actuation limitations—to the unsupported conclusion that the same tool could be used with Yeh. That is not enough. Where a proposed combination requires

modifying one reference to accommodate the architecture of another, Petitioner must explain the proposed modifications and why a POSITA would have reasonably expected them to succeed. The Petition does neither.

This omission is particularly significant because Berry's tool is not a universal driver. It is designed to cooperate with Berry's implant-specific geometry. Yet the Petition never analyzes the engineering changes needed to adapt Berry's specialized instrumentation to Yeh's implant. Nor does it explain whether those modifications would preserve Yeh's intended operation or Berry's purported advantages. It simply assumes compatibility without ever demonstrating it. Ex. 2031 ¶¶ 156-165.

Mr. Culbert confirmed the gap. He conceded that "obviously" some "modifications" would be required for the Yeh-Berry combination to function, but admitted that his declaration does not identify those modifications. Ex. 2030, 142:2-143:4. Thus, even Petitioner's expert does not support the Petition's premise that Berry's tool could be incorporated into Yeh without a meaningful redesign.

The Petition also fails to address the physical compatibility of the two systems. Berry's C-shaped engager is specifically configured to engage Berry's tubular body through Berry's own engagement geometry. The Petition never explains how that engager would engage Yeh's adjustment ring, beyond asserting that it could. Nor does it analyze whether the size, spacing, position, and arrangement of Yeh's tool holes would cooperate with Berry's engagement teeth. Ex. 2031 ¶ 158.

Those details define how torque is introduced into the implant and whether the instrument can remain properly engaged during actuation. *Id.* ¶¶ 158-159.

The Petition likewise does not explain whether Berry’s tool would remain secure throughout rotation or whether the proposed modification would introduce slippage, disengagement, or other mechanical interference. *Id.* ¶¶ 160-162. A POSITA would have recognized that these questions must be answered before concluding that Berry’s specialized actuator interface could simply be adapted to Yeh. Petitioner’s failure to address them confirms that its proposed combination rests on assumption rather than engineering analysis.

Petitioner’s entire implementation rationale spans only a few sentences. It observes that Berry’s tubular body contains apertures, Yeh’s adjustment ring contains openings, and Yeh’s implant is generally cylindrical. From those superficial similarities, Petitioner and Mr. Culbert conclude that “little to no modifications would be needed.” Pet. 70-71; Ex. 1002 ¶ 61. That conclusion is unsupported. Ex. 2031 ¶¶ 163-164. It does not explain why Berry’s implant-specific actuator interface would be mechanically compatible with Yeh’s materially different adjustment mechanism. It merely assumes that because the two systems perform the same general function—expanding the implant—their instrumentation is interchangeable. But the relevant inquiry is whether Berry’s particular interface could be reconciled with Yeh’s architecture and whether a POSITA would have expected the resulting

system to operate as intended. The Petition never conducts that analysis. *Id.* at ¶¶ 164-165.

The Petition's assertion that "little to no modifications would be needed" also ignores specific mechanical problems. Although Berry's C-shaped engager surrounds Berry's tubular body, it does not prevent the tool from moving or pivoting vertically relative to the implant. *Id.* at ¶ 160. That movement or pivoting would readily misalign Berry's engagement teeth with Yeh's tool holes. *Id.*

This risk is especially significant because Yeh's adjustment ring has only a single circumferential row of tool holes. Berry's tubular body, by contrast, includes multiple vertically spaced rows of apertures. Those multiple rows provide additional opportunities for engagement if the tool moves slightly in the axial direction. Yeh provides no comparable margin. A small vertical displacement that Berry's implant could accommodate could prevent Berry's teeth from engaging Yeh's single row of openings at all. *Id.* Neither the Petition nor Mr. Culbert addresses that problem.

Nor does Petitioner analyze the actual mechanics of the proposed implant-tool interface. Tooth reach, hole pitch, axial stability, torque reaction, clearance around the adjustment ring, interference with Yeh's translating upper support body, and retention during insertion and expansion all have to be addressed before a POSITA could reasonably expect Berry's tool to operate Yeh's adjustment ring. *Id.* at ¶ 158. The Petition addresses none of them.

Although Berry discloses additional structures that stabilize its tool and maintain alignment while torque is transmitted to the rotating tubular body, the Petition does not include them. *Id.* at ¶ 161. Those stabilizing structures cooperate with Berry's tubular body, which rotates but does not expand axially. Yeh's upper support body, by contrast, translates during expansion. Dr. Gall explains that incorporating Berry's stabilizing structures into Yeh would therefore create interference with Yeh's moving upper support body. *Id.* Again, the Petition does not address how Berry's tool would be stabilized without those structures or how, if included, would not interfere with Yeh's expansion.

Petitioner thus assumes compatibility based on general similarities while ignoring the specific geometries and operating relationships that determine whether the combination would function. Those assumptions cannot substitute for the reasoned technical analysis required to establish the proposed modification, a motivation to make it, and a reasonable expectation that it would succeed. *Id.* at ¶¶ 164-165.

4. Petitioner does not establish a reasonable expectation of success in implementing its proposed modification

Even assuming a POSITA would have wanted to incorporate Berry's expansion tool into Yeh, the Petition still must show that the resulting system would have been expected to operate successfully. *Id.* at ¶ 166. It does not.

A reasonable expectation of success requires more than identifying two references that concern expandable spinal implants. Petitioner must explain why the proposed modification would have been expected to function as intended. Here, its analysis rests on the unsupported assertion that Berry’s tool could be used with Yeh with “little to no modifications.” Pet. 70-71; Ex. 1002 ¶ 61; Ex. 2030, 141:13-143:4.

But the proposed combination is not a simple substitution of one hand tool for another. It requires adapting Berry’s integrated actuator interface—designed specifically for Berry’s implant architecture—to Yeh’s materially different adjustment mechanism. Whether that redesign would work depends on, among other things, the compatibility of the engagement geometry, alignment before and while torque is transmitted, retention of the tool during rotation, transfer of sufficient torque without slipping or disengaging, and preservation of Yeh’s expansion kinematics. Ex. 2031 ¶¶ 167-168, 172. Neither the Petition nor Mr. Culbert addresses those engineering requirements. They simply assume that Berry’s tool would reliably actuate Yeh’s adjustment ring while preserving Yeh’s intended operation.

Petitioner’s own expert testimony demonstrates why that assumption is insufficient. In discussing Schäfer, Mr. Culbert acknowledged that a toothed surgical instrument requires guidance to align with the implant before torque can be transmitted. He explained that, in an actual procedure, the surgeon operates a “long slender tool” from “4 to 6 inches away” and cannot keep the tool “perfectly straight”

without guidance. Ex. 2030, 91. He further testified that locating the engagement features “blindly” would be “very difficult,” and that a guide is needed so “the gears mate nicely.” *Id.* at 92-93.

That testimony identifies a basic engineering requirement applicable to Petitioner’s proposed combination: the tool must be guided into reliable alignment with the implant’s engagement features before it can transmit torque. Yet Petitioner identifies no corresponding guide in the proposed Yeh-Berry system. It does not explain how Berry’s tool would be kept “perfectly straight,” how its teeth would locate Yeh’s adjustment ring “blindly,” or what structure would guide the tool into engagement. *Id.*

The geometry of the proposed combination makes that omission particularly significant. Berry’s tubular body has multiple circumferential rows of apertures, allowing the tool’s engagement teeth to align with and enter the implant at numerous vertical positions. Yeh’s adjustment ring 130, by contrast, has only a single circumferential row of tool holes. Ex. 2031 ¶¶ 161-162, 172. Berry’s engagement teeth must therefore have to align precisely with Yeh’s lone row of openings before torque can even be transferred.

Petitioner never explains how that precise alignment would be achieved in the confined surgical environment described by its own expert. Nor does it address how engagement would be maintained while the tool rotates, whether vertical or angular

movement would cause disengagement, or how sufficient torque would be transmitted without slippage. Ex. 2030 at 91; Ex. 2031 ¶¶ 169-172.

Instead, the Petition assumes that because Berry and Yeh disclose openings, Berry's geared engager would necessarily engage Yeh's adjustment ring and operate it successfully. That is not a reasoned engineering analysis. It is especially inadequate where Petitioner's own expert testified that engaging toothed components without an appropriate guiding structure would not be physically feasible in actual surgical conditions. Ex. 2030 at 91; Ex. 2031 ¶ 173.

Petitioner therefore has not shown that a POSITA would have reasonably expected the proposed Yeh-Berry combination to succeed. Ground 4 fails for that independent reason. Ex. 2031 ¶ 198.

B. Yeh in View of Berry Does Not Teach or Suggest the Claimed Rotating Gear (Claims 8 and 12)

1. Claim 8

For claim 8, Petitioner identifies either threaded teeth 132 on Yeh's adjustment ring 130, or adjustment ring 130 itself, as the claimed rotatable gear. Pet. 82. That mapping is unsupported by technical analysis or record evidence. Ex. 2031 ¶ 174.

The fact that adjustment ring 130 and its threaded teeth rotate does not make them a gear. Threads and gears are different mechanical components with different geometries and functions. *Id.* at ¶ 175. Gears use teeth on wheels configured to mesh with other gear teeth on wheels to transfer rotational force without slipping.

Id. Threads are helical ridges designed for axial displacement. *Id.* A POSITA therefore would not have understood Yeh’s threaded teeth—or the ring on which they are formed—to be a rotatable gear merely because the ring rotates about the implant’s longitudinal axis. *Id.*

Petitioner’s mapping is also inconsistent with the intrinsic record. *Id.* at ¶ 176. The specification and file history confirm that the term “gear” is used according to its plain and ordinary mechanical meaning—not as a generic label for any rotatable or threaded component. The specification uses “gear” in its ordinary mechanical sense and repeatedly distinguishes gears from threaded bodies and screws. Ex. 1001, 3:8-12, 5:49-60, 6:10-13, 6:21-29, Figs. 1C-1D, 2C, 2F, 3C-3E. Patent Owner likewise distinguished threaded elements from the claimed gear during prosecution. *E.g.*, Ex. 1004 at 249-250. A POSITA therefore would have understood the claimed “rotating gear” to mean a mechanical gear, not any rotating threaded ring or threaded body. Ex. 2031 ¶¶ 175, 177.

Yeh’s adjustment ring is instead a threaded adjustment member that converts rotation into axial expansion through engagement between mating screw threads. Its threaded teeth 132 engage threaded teeth 122 on upper support body 120 to translate that body axially. That is a threaded actuation mechanism, not a gear train. The two mechanisms transmit motion through different engagement geometries and according to different mechanical principles.

Petitioner does not explain why a POSITA would nevertheless regard Yeh's threaded adjustment ring as the claimed rotating gear. It simply relabels the ring, or its threads, without supporting technical analysis. That is insufficient to establish obviousness.

Because the Yeh-Berry combination does not teach or suggest the claimed rotating gear, Petitioner has not carried its burden as to claim 8. *Id.* at ¶ 198.

2. Claim 12

Petitioner provides no meaningful analysis of claim 12's rotating gear limitation. *See* Pet. 85-87. Apart from incorporating its discussion of other claims, the Petition offers only the conclusory assertion that "adjustment ring 130 is a rotating gear." Pet. at 86.

That assertion is unsupported by exhibits, expert analysis, or any explanation of why a POSITA would understand Yeh's threaded adjustment ring to be a gear. For the reasons explained above, adjustment ring 130 and its threaded teeth 132 are threaded components that convert rotation into axial displacement through mating threads. They are not a rotating gear. Ex. 2031 ¶¶ 174-177.

Because the Yeh-Berry combination does not teach or suggest the claimed rotating gear, Petitioner has not carried its burden as to claim 12. Claim 17, which depends from claim 12, is patentable for the same reason. *Id.* at ¶ 198.

C. Yeh in View of Berry Does Not Teach or Suggest an Expansion Mechanism Comprising the Distinct Tool-Engagement Surface, Threaded body, and Turning Mechanism Structures as Required by Claim 1.

As explained above, claim 1 separately recites a tool-engagement surface, a threaded body, and turning mechanism as components of the expansion mechanism. *Id.* at ¶ 178. The surrounding claim language assigns those components different structural characteristics and functional relationships. Petitioner therefore must show that Yeh teaches each recited component and the distinct role the claim assigns to it.

Petitioner's mapping does not do so. It identifies Yeh's upper support body 120, lower support body 110, and adjustment ring 130 collectively as the claimed expansion mechanism. Pet. 61-62. It then identifies the tool holes 131 formed in adjustment ring 130 as the claimed tool-engagement surface. Pet. 64-66. Petitioner separately identifies that same adjustment ring 130 as the claimed turning mechanism because rotation of the tool causes adjustment ring 130 to rotate. Pet. 66-67. It further identifies the threaded engagement between threaded teeth 122 and 132 as the claimed threaded body. *Id.*

Petitioner thus relies on overlapping portions of adjustment ring 130 to satisfy both the tool-engagement surface and the turning mechanism. Ex. 2031 ¶ 179. The Petition does not acknowledge that overlap or explain how its mapping preserves the independent structural and functional significance of the separately recited components. It instead assumes that tool holes formed in the adjustment ring may

serve as one claimed component while the same ring serves as another, without addressing whether Yeh actually discloses the claim architecture that results.

Yeh's disclosure confirms that it does not. Yeh describes adjustment ring 130 as a single rotating component that receives torque from a tool inserted into tool holes 131. Rotation of adjustment ring 130 causes threaded teeth 132 on the ring to cooperate with threaded teeth 122 on upper support body 120, thereby translating the upper support body relative to lower support body 110 to expand the implant. Ex. 1008 ¶¶ 21, 26; Figs. 2, 6A-6B.

A POSITA therefore would have understood Yeh's adjustment ring 130 as one operative component that directly receives torque from the surgical tool and converts that rotation into implant expansion. Ex. 2031 ¶¶ 179-180. Tool holes 131 are openings formed in that same ring through which torque is applied. Yeh does not disclose those openings as a separate component having an independent structural role apart from the ring itself. *Id.* at ¶ 180.

Nor does Yeh disclose a turning mechanism distinct from adjustment ring 130. The ring itself receives the applied torque, rotates, and drives the threaded interaction that expands the implant. Petitioner therefore attempts to satisfy the separately recited tool-engagement surface and turning mechanism by assigning different claim labels to overlapping portions of the same operative structure. *Id.* at ¶ 181.

That mapping does not establish that Yeh teaches the arrangement required by claim 1. Although a single physical structure may in some circumstances satisfy more than one limitation, Petitioner still must show that the mapped structure satisfies each limitation and the distinct relationships the claim assigns to it. Petitioner does not explain how Yeh's single adjustment ring, including holes formed in that ring, discloses the separately recited tool-engagement surface, threaded body, and turning mechanism as arranged in claim 1.

Because Petitioner's mapping collapses those recited components without establishing their claimed structural and functional relationships, it does not show that Yeh teaches the claimed expansion mechanism. Ex. 2031 ¶¶ 182, 198.

D. Yeh in View of Berry Does Not Teach or Suggest an Expansion Mechanism Comprising the Distinct Tool-Engagement Surface and Rotating Gear Structures.

Claim 12 recites an expansion mechanism comprising both a tool-engagement surface and at least one rotating gear. Those limitations are separately recited and assigned different structural and functional roles. Ex. 2031 ¶¶ 178. Petitioner therefore must show that Yeh teaches each component and the relationship claim 12 assigns to it.

Petitioner does not do so. It identifies tool holes 131 formed in adjustment ring 130 as the claimed tool-engagement surface, while simultaneously identifying that same adjustment ring 130 as the claimed rotating gear. Pet. 68-69. Petitioner

thus relies on overlapping portions of the same structure to satisfy both limitations, without acknowledging the overlap or explaining how that mapping preserves the independent significance of the separately recited components. Ex. 2031 ¶ 179.

Yeh's disclosure confirms the problem. Yeh describes adjustment ring 130 as a single rotating adjustment ring having tool holes through which a surgical tool applies torque. Ex. 1008 ¶¶ 21, 26; Figs. 2, 6A-6B; Ex. 2031 ¶ 180. The tool holes are openings formed in the ring; Yeh does not disclose them as a separate structural component distinct from the ring itself.

And, as explained above, Yeh does not disclose adjustment ring 130 as a gear. It is a threaded adjustment member whose threaded teeth cooperate with corresponding threads on upper support body 120 to convert rotation into axial movement. Petitioner therefore cannot satisfy claim 12 merely by labeling the holes in adjustment ring 130 as the tool-engagement surface and the same threaded ring as the rotating gear.

Although a single physical structure may in some circumstances satisfy more than one limitation, Petitioner still must show that its mapping satisfies each limitation and the distinct relationships required by the claim. It has not done so here. Its theory collapses the tool-engagement surface and rotating gear into the same underlying adjustment ring without establishing that Yeh teaches either the claimed structural distinction or the claimed gear. Ex. 2031 ¶¶ 181-182.

Petitioner therefore fails to show that Yeh, alone or in combination with Berry, teaches or suggests the expansion mechanism required by claim 12. Ex. 2031 ¶ 198.

E. Yeh in View of Berry Does Not Teach or Suggest the Claimed Tool-Engagement Surface as Required by Claims 1 & 12.

Claims 1 and 12 impose several coordinated requirements on the claimed tool-engagement surface. The expansion mechanism must comprise a tool-engagement surface. Ex. 1001, claims 1 (limitation [1.d]) and 12 (limitation [12.d]). The tool must remain engaged with that surface while the tool is rotated about its longitudinal axis. *Id.*, limitations [1.f]-[1.g], [12.e]-[12.f]. And the tool-engagement surface must be “positioned and configured to be engaged by the tool extending along a direction of insertion.” *Id.*, limitations [1.i] and [12.h]. Ex. 2031 ¶ 183.

In the proposed Yeh-Berry combination, Petitioner identifies “the contours of ‘tool holes 131,’” in Yeh as the claimed tool-engagement surface. Pet. 63, 65-71. But the Petition never makes clear what structure those “contours” encompass. Petitioner could mean: (1) the collective contours of all tool holes 131; (2) the contours of a single tool hole 131; or (3) the contours of whichever tool hole happens to be engaged by a tooth of Berry’s tool at a particular moment during rotation.

The ambiguity matters because the claims require continued engagement with the same claimed tool-engagement surface during rotation. Petitioner’s mapping fails under each possible interpretation. Ex. 2031 ¶ 184.

1. If Petitioner Maps the Claimed Tool-Engagement Surface to the Collective Contours of Tool Holes 131, Berry’s Tool Does Not Engage, nor Remain Engaged with the Claimed Surface.

A POSITA would not have understood the separate contours of multiple, physically distinct tool holes to constitute a single surface. Ex. 2031 ¶ 185.

Even accepting Petitioner’s apparent theory, however, the proposed combination still fails. Claims 1 and 12 require the tool to be engaged with the tool engagement surface and to remain engaged with that surface while the tool rotates about its longitudinal axis. Ex. 1001, limitations [1.f]-[1.g] and [12.e]-[12.f] (“rotating of a tool engaged with the tool-engagement surface” and “rotating the tool about a longitudinal axis of the tool while the tool is engaged with the tool-engagement surface”). If the claimed surface consists of the collective contours of all tool holes 131, the tool would need to engage that collective surface during rotation. Berry’s tool never does. Its teeth engage only one—or, at most, two—tool holes at any given time. Ex. 1009, Fig. 2; Ex. 2031 ¶¶ 185-186. Berry’s tool therefore is never engaged with the collective contours of all tool holes 131 and cannot remain engaged with that alleged surface while rotating.

Under this interpretation, the Yeh-Berry combination does not teach limitations [1.f]-[1.g] and [12.e]-[12.f].

2. If Petitioner Maps the Tool-Engagement Surface to a Single Tool Hole, Berry's Tool Does Not Remain Engaged with That Tool Hole Surface During Rotation.

If Petitioner instead contends that only one tool hole is necessary, the proposed Yeh-Berry combination still fails.

Claims 1 and 12 require the tool to remain engaged with the tool-engagement surface while the tool rotates about its longitudinal axis. Ex. 1001, claims 1 (limitations [1.f]-[1.g]) and 12 (limitations [12.e]-[12.f]). Petitioner's expert confirmed that, as Berry's tool rotates, successive teeth on the tool engage successive tool holes in Yeh's adjustment ring. Ex. 2030, 138:3-8. Thus, Berry's tool does not remain engaged with any particular tool hole during tool rotation. Ex. 2031 ¶ 187. Each engaged tool hole is necessarily disengaged as the next tooth advances into a different hole. *Id.* The proposed combination therefore does not teach a tool that remains engaged with a single claimed tool-engagement surface while rotating, as limitations [1.f]-[1.g] and [12.e]-[12.f] require.

The combination also fails the related direction-of-insertion limitations. Claims 1 and 12 also require the tool-engagement surface to be "positioned and configured to be engaged by the tool extending along a direction of insertion." Ex. 1001, claims 1 (limitation [1.i]) and 12 (limitation [12.h]). Read together with limitations [1.g] and [12.f], the claims require the identified tool-engagement surface

to remain engaged by the tool extending along a direction of insertion while the tool rotates about its longitudinal axis. Ex. 2031 ¶ 187.

That does not occur in the proposed combination. As Berry's tool rotates, its teeth and Yeh's holes move in opposite directions. Ex. 1009 ¶¶ 25–26, 29, 31, Figs. 3–5. The contact therefore shifts from one tool hole to another rather than remaining with a single identified surface. Ex. 2031 ¶¶ 187-188. Petitioner's expert agreed that the contact point between Berry's teeth and the implant apertures changes during rotation. Ex. 2030 139:20-25.

This admission confirms that no single tool hole remains engaged by the tool extending along the direction of insertion while the tool rotates. The Yeh-Berry combination therefore also fails to teach limitations [1.i] and [12.h].

3. If Petitioner Maps the Claimed Tool-Engagement Surface to Whichever Tool Hole Is Engaged at a Particular Moment, Its Mapping Improperly Changes the Identity of the Claimed Structure.

Petitioner's remaining possible theory is that the claimed tool-engagement surface changes during operation, becoming whichever tool hole happens to be engaged by a tooth of Berry's tool at a given moment. That interpretation is inconsistent with the claim language.

Claims 1 and 12 first recite a tool-engagement surface and later require the tool to remain engaged with that tool-engagement surface while rotating about its longitudinal axis. Ex. 1001, claims 1 (limitations [1.d], [1.f]-[1.g]) and 12

(limitations [12.d]-[12.f]). Those later limitations refer back to the same previously identified structure—not to a succession of different structures whose identify changes as the mechanism rotates. Ex. 2031 ¶ 188.

Under Petitioner’s theory, however, the identity of the alleged tool-engagement surface would change continuously. A first tooth would engage the contours of a first tool hole. As Berry’s tool rotated, that tooth would disengage from the first hole, and another tooth would engage the contours of a different hole. *Id.* at ¶¶ 189-190. Even if engagement briefly overlaps as one tooth disengages and another engages, the teeth are still contacting different surfaces.

Petitioner therefore never identifies a single corresponding structure that satisfies all of the claim requirements relating to the tool-engagement surface. *Id.* Instead, the identity of the alleged surface must shift from one hole to another during rotation. The same defect also prevents the proposed combination from satisfying limitations [1.i] and [12.h], which require the identified tool-engagement surface to be positioned and configured for engagement by the tool extending along the direction of insertion.

Thus, Petitioner’s mapping fails under every possible interpretation. If the alleged tool-engagement surface is the collective contours of all tool holes 131, Berry’s tool never engages that collective surface. If it is the contours of a single tool hole, the tool does not remain engaged with that hole during rotation. And if it is

whichever hole happens to be engaged at a given moment, the identity of the claimed structure impermissibly changes throughout operation.

The proposed Yeh-Berry combination therefore does not teach or suggest the claimed tool-engagement surface or its associated limitations. Petitioner has not carried its burden of proving independent claims 1 or 12 unpatentable. Claims 2-4, 8, 10-11, and 17 are likewise patentable at least because they depend from claim 1 or claim 12. Ex. 2031 ¶ 198.

X. GROUND 5: YEH IN VIEW OF BERRY AND SCHÄFER FAILS TO RENDER CLAIMS 5-6 AND 18-19 OBVIOUS.

Ground 5 addresses claims that depend from the independent claims challenged in Ground 4. Petitioner does not modify its Yeh-Berry theory in a manner that cures any of the deficiencies identified above. It still fails to establish a sufficient motivation to combine Yeh and Berry, explain the proposed modification, show a reasonable expectation of success, or identify the claim limitations missing from the proposed combination. Ground 5 therefore fails for at least the same reasons as Ground 4.

A. Petitioner Does Not Establish a Motivation to Combine Yeh, Berry, and Schäfer.

As explained above, Petitioner has not established a motivation to combine Yeh with Berry. Ground 5 adds a further modification: incorporating selected features of Schäfer's shell geometry to satisfy dependent claims 5, 6, 18, and 19. But

Petitioner never provides a proper explanation as to why a POSITA would have made that additional modification. Ex. 2031 ¶ 191.

Petitioner asserts only that incorporating Schäfer's shell geometry "would not have hindered or altered the operation" of Yeh's expandable implant. Pet. 93. But the relevant inquiry under § 103 is not merely whether the proposed modification could theoretically be implemented without rendering the device inoperable. Petitioner must explain why a POSITA would have further modified the already-redesigned Yeh-Berry implant to incorporate Schäfer's shell geometry.

The Petition provides no such explanation. It points to no deficiency in the proposed Yeh-Berry combination, no problem that Schäfer's shell geometry would solve, and no engineering reason why a POSITA would have selected Schäfer's configuration over other possible implant geometries. Ex. 2031 ¶ 194.

That omission is significant because Schäfer is not simply a source of isolated shell features. *Id.* at ¶ 192. Its shell geometry is part of an implant architecture that operates differently from Yeh's. *Id.* at ¶ 193. In Yeh, adjustment ring 130 rotates to expand the implant. In Schäfer, supporting ring 18 remains stationary while separate inner sleeves rotate to move the outer sleeves apart. *Id.*; Ex. 1010, Abstract, 3:17-34, 6:12-14, 7:6-7.

A POSITA therefore would not have viewed Schäfer's shell configuration as an interchangeable feature that could simply be transplanted into the proposed Yeh-

Berry system. Ex. 2031 ¶ 194. Petitioner was required to explain how Schäfer's geometry would be incorporated into the materially different Yeh-Berry architecture, whether the resulting components would remain mechanically compatible, and why a POSITA would have made that redesign. It does not. *Id.*

Ground 5 thus reflects the same claim-driven reconstruction as Ground 4. Petitioner extracts selected features from three different implant systems because, collectively, those features allegedly correspond to the challenged claims. It does not show that the prior art itself would have led a POSITA to combine them in the proposed manner. *See ActiveVideo Networks*, 694 F.3d at 1327 (warning against treating prior-art references as a collection of interchangeable components selected to match claim limitations).

Because Petitioner does not establish a sufficient motivation to further modify the proposed Yeh-Berry combination with Schäfer, Ground 5 fails as to claims 5, 6, 18, and 19. Ex. 2031 ¶ 198.

XI. GROUND 6: YEH IN VIEW OF BERRY AND SUDDABY FAILS TO RENDER CLAIMS 9 AND 20 OBVIOUS.

Ground 6 addresses claims that depend from the independent claims challenged in Ground 4. Petitioner does not modify its Yeh-Berry theory in a manner that cures any of the deficiencies identified above. Ground 6 therefore fails for at least the same reasons as Ground 4.

A. Petitioner Does Not Establish a Motivation to Combine Yeh, Berry, and Suddaby.

As explained above, Petitioner has not established a motivation to combine Yeh with Berry. Ground 6 adds Suddaby to supply the additional requirement that the shells comprise titanium. Petitioner argues that titanium was a well-known implant material with desirable properties, including strength, biocompatibility, and corrosion resistance, and relies on Mr. Culbert's opinion that titanium was a standard material for intervertebral implants. Pet. 94.

Those general observations may show that a POSITA would have considered titanium for spinal implants. They do not explain why a POSITA would have selected Suddaby to further modify the already-redesigned Yeh-Berry combination.

Petitioner's reliance on Suddaby's statement that its implant is "easy to manufacture from common materials" does not supply that reason. *Id.* (citing Ex. 1011, 2:26-28). Suddaby does not attribute that alleged manufacturing advantage to titanium. Nor does the Petition explain why the statement would have led a POSITA to incorporate Suddaby's teachings into the proposed Yeh-Berry system. Ex. 2031 ¶ 195.

Petitioner's analysis therefore reduces to the proposition that, because titanium was generally known as a suitable implant material, a POSITA would have selected Suddaby because Suddaby happens to disclose titanium. That is not a reference-specific motivation to combine. *Id.* at ¶¶ 196-197.

Instead, the theory follows the same claim-driven path as Petitioner's other obviousness grounds: it begins with the challenged claims, identifies titanium as a remaining limitation after combining Yeh and Berry, and then selects Suddaby because it discloses that limitation. Yet Suddaby describes a device with materially different geometry and a different expansion mechanism. *See e.g.*, Ex. 1011, Figs. 1A-1B. The Petition does not explain why a POSITA would have looked to that device to modify the proposed Yeh-Berry system. Ex. 2031 ¶¶ 196-197.

Because Petitioner does not establish a sufficient motivation to further modify the proposed Yeh-Berry combination with Suddaby, Ground 6 fails as to claims 9 and 20. *Id.* at ¶ 198.

XII. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Board find that all challenged claims are patentable.

Date: July 20, 2026

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

I certify that this paper complies with the type-volume limitations of 37 C.F.R. §42.24(b)(2) because it contains 13,556 words (determined by the word-processing system used to prepare this paper), excluding the parts of the paper exempted by 37 C.F.R. §42.24(a).

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **PATENT OWNER'S RESPONSE** and corresponding **Exhibits 2029-2032** were served electronically via e-mail on July 20, 2026, in their entireties on the following counsel of record for Petitioner:

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