

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIFE SPINE, INC.,
Petitioner,

v.

GLOBUS MEDICAL, INC.,
Patent Owner.

IPR2022-01434
Patent 8,845,731 B2

Before KRISTI L. R. SAWERT, CYNTHIA M. HARDMAN, and
MICHAEL A. VALEK, *Administrative Patent Judges*.

HARDMAN, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314
Granting Petitioner's Motion to File Under Seal
37 C.F.R. §§ 42.14, 42.54

I. INTRODUCTION

Petitioner Life Spine, Inc. requests *inter partes* review of claims 1–15 of U.S. Patent No. 8,845,731 B2 (“the ’731 patent,” Ex. 1001). Paper 2 (“Pet.”). Patent Owner Globus Medical, Inc. filed a Preliminary Response. Paper 9 (“Prelim. Resp.”). With our authorization, Petitioner filed a Preliminary Reply and Patent Owner filed a Preliminary Sur-reply. Paper 10 (“Prelim. Reply”); Paper 11 (“Prelim. Sur-reply”).¹

We have authority under 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” After considering the Petition, Preliminary Response, Preliminary Reply, Preliminary Sur-reply, and associated evidence, we institute an *inter partes* review.

The following preliminary findings of fact and conclusions of law are made solely for determining whether to institute review. Any final decision will be based on the full trial record.

A. *Real Parties in Interest*

Petitioner and Patent Owner each identify themselves as the real party in interest. Pet. 1; Paper 8 (Patent Owner Updated Mandatory Notices), 1.

¹ The Board observes that both parties delete spacing between words, in an apparent effort to circumvent our word count limits. For example, Petitioner uses “EX1002,” while Patent Owner uses “Ex-1001” and “Culbert-Declaration.” See, e.g., Pet. 7; Prelim. Resp. 35. The parties are cautioned that continuing this practice may lead to a party’s brief not being considered. See Consolidated Office Trial Practice Guide (Nov. 2019), at 40, *available* at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

B. Related Matters

The parties identify *Globus Medical, Inc. v. Life Spine, Inc.*, 1:21-cv-01445 (D. Del.), filed October 13, 2021, as involving the '731 patent. Pet. 1; Paper 8, 1. The parties also identify a number of patent applications related to the '731 patent, i.e., 17/192,231, 17/409,079, 17/410,335, 17/589,029, and 17/931,913. Pet. 1–2; Paper 8, 1. Patent Owner also identifies a number of related *inter partes* review proceedings, i.e., IPR2022-01435, IPR2022-01599, IPR2022-01600, and IPR2023-00041. Paper 8, 1.

C. The '731 Patent (Ex. 1001)

The '731 patent, titled “Expandable Fusion Device and Method of Installation Thereof,” relates to an expandable device for insertion between adjacent vertebrae to facilitate fusion. Ex. 1001, code (54), 2:49–50. According to the Specification, a need exists for a fusion device that is “capable of being installed inside an intervertebral disc space at a minimum to no distraction height and . . . can maintain a normal distance between adjacent vertebral bodies when implanted.” *Id.* at 1:44–48. The '731 patent purports to meet this need with a fusion device including first and second endplates and a central ramp capable of moving in a first direction to push the endplates outwardly into an expanded configuration. *Id.* at 1:56–60.

The Specification describes exemplary expandable fusion devices for installing in an intervertebral disc space to facilitate intervertebral fusion. *Id.* at 1:52–56. One exemplary device is depicted in Figure 50, reproduced below.

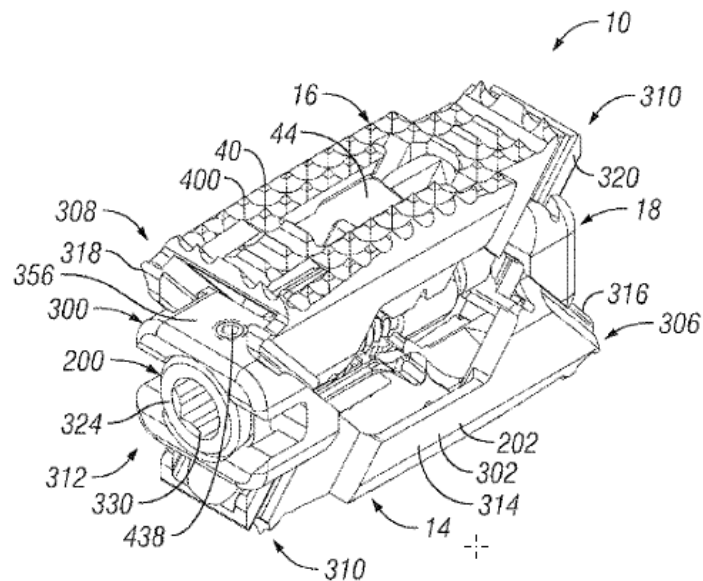


FIG. 50

Figure 50 of the '731 patent, reproduced above, is a perspective view of expandable fusion device 10 in an expanded position. *Id.* at 4:26–29, 16:20–21. Expandable fusion device 10 includes first endplate 14, second endplate 16, central ramp 18, actuator assembly 200, and driving ramp 300. *Id.* at 16:21–24. Actuator assembly 200 functions to pull central ramp 18 and driving ramp 300 together, which forces apart endplates 14 and 16. *Id.* at 16:24–28.

Figure 52 of the '731 patent is reproduced below.

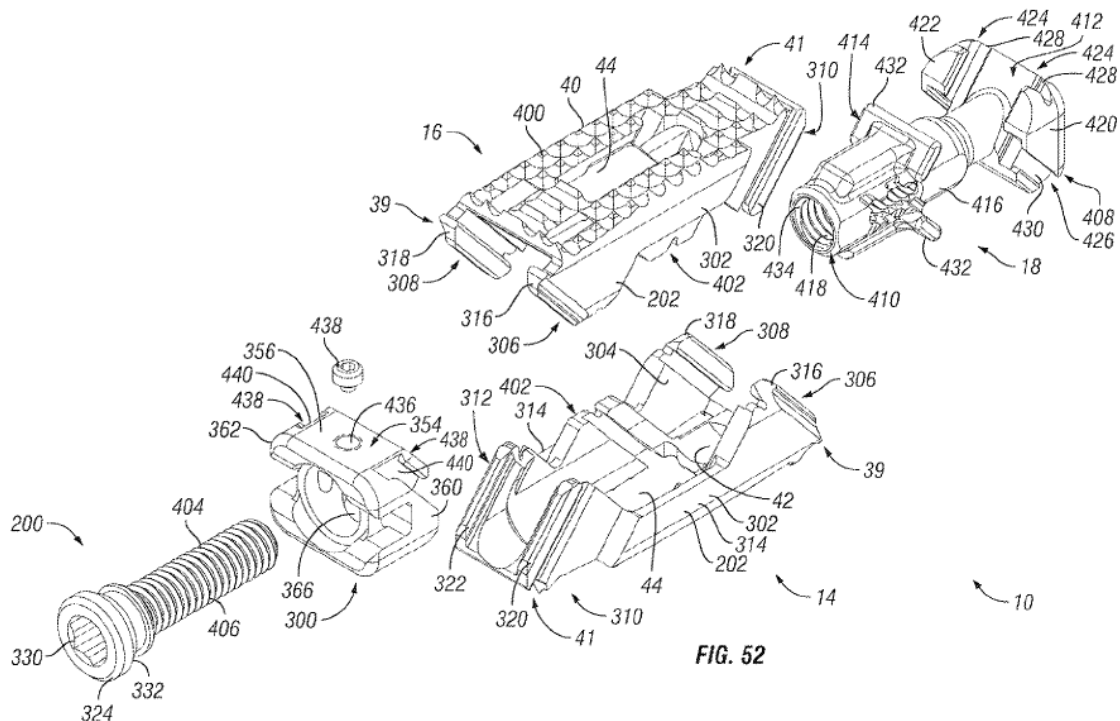


Figure 52, reproduced above, is an exploded view of expandable fusion device 10. *Id.* at 4:33–35. Central ramp 18, which has first end 408 and second end 410, includes first expansion portion 412, second expansion portion 414, rod-receiving extension 416, and longitudinally-extending through bore 418. *Id.* at 18:1–6. Rod-receiving extension 416 is threaded to receive threading of extension 404 of actuator assembly 200. *Id.* at 18:46–49. Driving ramp 300 includes bore 366 sized to receive extension 404. *Id.* at 18:55–57. Actuator assembly 200 includes head portion 324 with rim 332, which engages contact surface 368 of driving ramp 300. *Id.* at 18:61–64.

In operation, expandable fusion device 10 is seated into an intervertebral disc space. *Id.* at 19:22–24. An instrument is used to engage head portion 324 of actuator assembly 200. *Id.* at 19:38–40. Rotating

actuator assembly 200 in a first direction pulls central ramp 18 linearly towards driving ramp 300 and pushes driving ramp 300 linearly towards central ramp 18. *Id.* at 19:50–52, 20:4–8. Ramped portions of central ramp 18 and driving ramp 300 push against corresponding ramped portions of endplates 14 and 16, which forces the endplates outward into an expanded position. *Id.* at 19:50–55, 20:8–13.

D. Challenged Claims

Petitioner challenges all 15 claims of the '731 patent. Claims 1, 10, and 15 are independent. Claim 1, reproduced below with bracketed lettering added,² is illustrative:

1. [pre] An intervertebral implant comprising:
 - [a] a first endplate, wherein the first endplate includes a first side portion, the first side portion including a first ramped portion;
 - [b] a second endplate, wherein the second endplate includes a second side portion, the second side portion including a second ramped portion;
 - [c] a central ramp disposed between the first endplate and the second endplate;
 - [d] a driving ramp disposed between the first endplate and the second endplate;
 - [e] an actuation member coupled to the driving ramp and the central ramp;
 - [f] wherein the central ramp is configured to move in a first direction and cause the first and second endplates to move outwardly and away from one another, and [g] the central ramp is configured to move in a second direction and cause the first and second endplate to move inward and towards one another,

² For ease of reference, we use the same bracketed lettering Petitioner uses in the Petition. *See* Pet. 7–21, 129.

[h] wherein the central ramp comprises an expansion portion and an extension, the extension extending in a longitudinal axis from the expansion portion

[i] wherein the first endplate and the second endplate are coupled to the expansion portion of the central ramp,

[j] wherein the actuation member extends through an unthreaded opening in the driving ramp and extends into a threaded opening in the extension of the central ramp;

[k] wherein when the actuation member is rotated the driving ramp is fixed with respect to the actuation member and the central ramp is moved in either the first direction or the second direction.

Ex. 1001, 20:36–21:21.

Challenged independent claims 10 and 15 are similar to claim 1, but have a few notable differences. For example, unlike claim 1, claim 10 requires that the first and second ramped portions of the endplates “are complementary with one another.” *Id.* at 22:24–26. Additionally, like claim 1, claims 10 and 15 require an “extension,” but unlike claim 1 they do not require that the extension “extend[] in a longitudinal axis from the expansion portion.” *Id.* at 22:14–50, 23:4–24:16.

Challenged claims 2–9 depend directly or indirectly from independent claim 1 and recite additional features, including with respect to the first and/or second endplates (claims 2, 3), the central ramp (claims 4, 5, 7, 8), the driving ramp (claim 6), and the actuation member (claim 9). *Id.* at 21:22–22:12. Challenged dependent claims 11–14 depend directly or indirectly from claim 10, and recite additional features, including with respect to the driving ramp (claims 11, 12), and the actuation member or actuation assembly (claim 13, 14). *Id.* at 22:51–23:3.

E. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1–15 are unpatentable on the following grounds:

Ground	Claim(s) Challenged	35 U.S.C. § ³	Reference(s)/Basis
1	1–15	§ 102(b)	Chung ⁴
2	1–15	§ 103(a)	Chung, Baynham ⁵ ,
3	1–15	§ 103(a)	Olmos ⁶ , Chung
3	2–6, 10–14	§ 103(a)	Chung, Olmos, Baynham

Pet. 3. Petitioner supports its contentions with the Declaration of Troy D. Drewry (Ex. 1002), among other evidence. Patent Owner supports its contentions with the Declaration of Brad Culbert (Ex. 2001), among other evidence.

³ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended several provisions of 35 U.S.C., including §§ 102 and 103. Petitioner asserts that “September 3, 2010 is the effective filing date.” Pet. 4. Based on this effective filing date, the pre-AIA versions of 35 U.S.C. §§ 102 and 103 apply.

⁴ Chung et al., KR 20-0290058, issued September 26, 2002 (“Chung,” Ex. 1005). Exhibit 1005 includes a certified English translation on pages 1–12 and the original Korean document on pages 13–22. When citing Chung herein, we refer to the page numbers indicated by the six-digit page numbering scheme applied at the bottom center of the exhibit. For convenience we drop the lead-in zeros.

⁵ Baynham et al., U.S. Patent Publication 2007/0270968 A1, published November 22, 2007 (“Baynham,” Ex. 1007).

⁶ Olmos et al., U.S. Patent Publication 2008/0140207 A1, published June 12, 2008 (“Olmos,” Ex. 1006).

II. ANALYSIS

A. Discretionary Denial Under § 325(d)

The parties dispute whether the Board should discretionarily deny the Petition under 35 U.S.C. § 325(d). Prelim. Resp. 12–32; Pet. 125–128; Prelim. Reply 1–3; Prelim. Sur-reply 1–3.

1. Legal Standard

Section 325(d) provides that the Director⁷ may “reject the petition” if “the same or substantially the same prior art or arguments previously were presented to the Office.” The Board analyzes this issue under a two-part framework:

(1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6, 8 (PTAB Feb. 13, 2020) (precedential).

In analyzing whether the same or substantially the same art or arguments were previously presented to the Office, we consider factors including: (i) the similarities and material differences between the asserted art and the prior art previously presented to the Office; (ii) the cumulative nature of the asserted art and the prior art previously evaluated by the Office; and (iii) the extent of the overlap between the arguments made before the

⁷ The Board institutes trial on behalf of the Director. 37 C.F.R. § 42.4(a).

Office and the manner in which the petitioner relies on the prior art or the patent owner distinguishes the prior art. *See id.* at 8–10.

In analyzing whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims, we consider factors including: (iv) the extent to which the asserted art was evaluated by the Office, including whether the prior art was the basis for rejection during examination; (v) whether the petitioner has pointed out sufficiently how the Office erred in its evaluation of the asserted prior art; and (vi) the extent to which additional evidence and facts presented in the petition warrant reconsideration of prior art or arguments. *See id.*

2. Analysis

There is no dispute that Olmos and Baynham were before the Office. *See* Pet. 126 (acknowledging that “Baynham was listed in a Notice of References Cited” and “[t]he Examiner rejected pending claims over Olmos in five office actions”); Prelim. Resp. 13. Accordingly, Olmos and Baynham are “[p]reviously presented art.” *Advanced Bionics*, IPR2019-01469, Paper 6, at 7–8 (indicating that “previously presented art” includes “art made of record by the Examiner”).

Chung, however, stands on different footing. There is no dispute that Chung was not before the Office, and thus is not the “same” art previously presented to the Office. *See* Pet. 126; Prelim. Resp. 29 (acknowledging that “Chung was not before the Office”); *Advanced Bionics*, IPR2019-01469, Paper 6, at 13–14. Nevertheless, Patent Owner argues that Chung is cumulative of Olmos and thus “substantially the same” as art that was before the Office. Prelim. Resp. 29.

We are not persuaded that Chung is cumulative of Olmos. Patent Owner presents a table purporting to show that Petitioner's mapping of Chung to the challenged claims is similar to Petitioner's mapping Olmos to the challenged claims. See Prelim. Resp. 16–26. Petitioner, however, maps Olmos to the challenged claims in a materially different manner than the Examiner mapped Olmos to the claims. As one example, Patent Owner itself points out that Petitioner maps Olmos's "guide member 230" to the claimed "extension," whereas the Examiner never made this mapping, and "instead identified various rod-like components as the alleged 'extension.'" Prelim. Resp. 10–11; see also *id.* at 30 ("The prosecution history uniformly demonstrates that the Examiner did not consider the guide 232 of the distal wedge 208 to meet the 'extension' limitation."); Prelim. Sur-reply 2 (arguing same).

Thus, we find that "the extent of the overlap between the arguments made during examination and the manner in which petitioner relies on the prior art" are different. *Advanced Bionics*, IPR2019-01469, Paper 6, at 9 n.10. We find that this factor, combined with the fact that Chung itself was not before the Examiner, demonstrates that Chung is not cumulative of Olmos at least as Olmos was previously applied by the Examiner. In other words, Petitioner is advancing different art (Chung) and reasoning compared to the art and reasoning previously considered by the Office. The *Advanced Bionics* framework "reflects a commitment to defer to previous Office evaluations of the evidence." *Id.* at 9. Here, however, the Office did not evaluate Chung or the arguments Petitioner presently advances based on Chung in its prior consideration of Olmos. Thus, we are not persuaded that Petitioner's similar mapping of Chung and Olmos to the challenged

claims—where that mapping differs from the Examiner’s mapping of Olmos to applicant’s claims—compels a conclusion that Chung is cumulative of Olmos.

Every ground of the Petition includes Chung, a reference that was not before the Examiner. And Petitioner uses Chung differently than the Examiner used the allegedly cumulative reference, Olmos. Accordingly, we find that the first part of the *Advanced Bionics* framework is not met with respect to Chung. See, e.g., *Halliburton Energy Servs., Inc. v. U.S. Well Servs., LLC*, IPR2021-01036, Paper 12 at 19–20 (PTAB Jan. 19, 2022); *Advanced Bionics*, IPR2019-01469, Paper 6 at 10. For this reason, even though Olmos and Baynham were before the Office, we find that § 325(d) is not sufficiently implicated such that its statutory purpose would be undermined by instituting on all challenges. See SAS Q&A’s (June 5, 2018),⁸ Question/Answer D1 (explaining that “[i]n view of the Office’s policy to institute on all challenges or none,” where “only some of the challenges fall within” the scope of § 325(d), “[t]he panel will evaluate the challenges and determine whether § 325(d) is sufficiently implicated that its statutory purpose would be undermined by instituting on all challenges”). Accordingly, we decline to exercise our discretion to deny *inter partes* review under § 325(d).

B. Principles of Law

In an *inter partes* review, “the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.”

⁸ Available at https://www.uspto.gov/sites/default/files/documents/sas_qas_20180605.pdf.

Harmonic Inc. v. Avid Tech., Inc., 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). Petitioner ultimately bears the burden of persuasion to prove unpatentability of each challenged claim by a preponderance of the evidence. 35 U.S.C. § 316(e). This burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). The Board may authorize an *inter partes* review if we determine that the information presented in the Petition and Patent Owner’s Preliminary Response shows that there is a reasonable likelihood that Petitioner will prevail with respect to at least one of the claims challenged in the petition. 35 U.S.C. § 314(a).

Anticipation under 35 U.S.C. § 102 requires that a prior art reference set forth each and every element of a claim as set forth in the claim. *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987); *see also Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) (anticipation not only requires that each element of a claim be present in a prior art reference, but also the “arrangement or combination” of those elements).

A claim is unpatentable as obvious under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. 35 U.S.C. § 103(a) (2006); *see also KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on underlying factual determinations including: (1) the scope

and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) any objective indicia of nonobviousness.⁹ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). An obviousness determination requires finding a reason to combine accompanied by a reasonable expectation of achieving what is claimed in the challenged patent. *See Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016). “[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *KSR*, 550 U.S. at 419–20.

C. Level of Ordinary Skill in the Art

We consider the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art as of September 3, 2010. *See Graham*, 383 U.S. at 17–18; *supra* n.3. Petitioner contends that a person of ordinary skill in the art (sometimes abbreviated herein as “POSITA”):

would have had a bachelor’s degree in mechanical engineering or biomedical engineering and two or more years of experience in biomechanical engineering, biomedical engineering, and/or spinal implant devices. A person could also have qualified as a POSITA with some combination of more formal education (e.g., an M.D.) and less technical experience or less formal education and more technical or professional experience in the foregoing fields, and would have had further appreciation of various technical concepts in this field, as explained by Prof. Drewry.

⁹ Patent Owner does not presently assert objective indicia supporting nonobviousness of the challenged claims. *See generally* Prelim. Resp.; Prelim. Sur-reply.

Pet. 5 (citing Ex. 1002 (Drewry Decl.) ¶¶ 30, 43–62). Patent Owner does not presently dispute Petitioner’s proposal. Prelim. Resp. 1.

Because Petitioner’s proposed level of ordinary skill in the art appears to be consistent with the cited prior art and is undisputed on this record, we adopt it for purposes of this Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (indicating that the prior art itself may reflect an appropriate skill level).

D. Claim Construction

In AIA proceedings we interpret a claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). Under this standard, we construe the claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*; *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–19 (Fed. Cir. 2005) (en banc).

Petitioner asserts that the claims do not “require constructions differing from their plain and ordinary meaning.” Pet. 4. Patent Owner argues that Petitioner’s interpretations of the claim terms “extension,” “expansion portion,” and “complementary with one another” in Petitioner’s discussion of the asserted grounds are contrary to the plain and ordinary meaning of these terms and are inconsistent with the Specification. *See, e.g.*, Prelim. Resp. 36–40 (addressing the meaning of “extension”); 41–47 (addressing the meaning of “expansion portion”); 85–93 (addressing the meaning of “complementary with one another”); Prelim. Reply 3–5.

We provide preliminary constructions for each of these terms below. Any final written decision entered in this case may include final claim

constructions that differ from these preliminary constructions, or from any discussion of claim scope provided in our analysis below. Any final claim constructions will be based on the full trial record.

1. “*extension*” (*Independent Claims 1, 10, 15*)

Patent Owner argues that an “extension” (as recited in independent claims 1, 10, and 15) is “a structure that increases the length of the central ramp.” Prelim. Sur-reply 3; *see also* Prelim. Resp. at, *e.g.*, 36, 38. Patent Owner supports this construction by arguing, among other things, that the Examiner “repeatedly identified the ‘extensions’ in Olmos as various rod-like structures,” and “the specification repeatedly identifies the central ramp ‘extension’ . . . as structures that increase the length of the ramp.” Prelim. Resp. 37, 39. Patent Owner argues that Petitioner’s suggestion that “anything protruding” or any “outgrowth protrusion off of the surface of the ramp” is not supported by the intrinsic evidence. Prelim. Resp. 39; Prelim. Sur-reply 4.

Petitioner responds that Patent Owner’s construction “would improperly read limitations into the claims based on disclosed embodiments.” Prelim. Reply 3. Petitioner also argues that the Specification uses the term “‘extension’ to refer to a myriad of structures,” and “[t]he Examiner likewise applied ‘extension’ broadly to a variety of structures.” *Id.* (citing Ex. 1001, 5:47–58, Fig. 10, 11:8–10, 11:40–42, Fig. 23, 9:40–45, 10:1–19, Fig. 24, claims 2, 3; Ex. 1004, 42–44, 66–67, 126–27).

On this preliminary record, Petitioner has the better argument. It appears that Patent Owner’s construction improperly reads in limitations from example embodiments, such as the embodiments depicted in Figures

25 and 46 of the '731 patent. *See* Prelim. Resp. 39 (Patent Owner's annotated Figures 25 and 46). Petitioner demonstrates that both the Specification and the Examiner used the term "extension" more broadly to refer to a variety of structures, not merely to structures that "increase the length of the central ramp." *See, e.g.*, Prelim. Reply 3; Ex. 1001, 5:47–58, Fig. 10, 11:8–10, 11:40–42, Fig. 23, 9:40–45, 10:1–19, Fig. 24, claims 2, 3; Ex. 1004, 42–44, 66–67, 126–27. Patent Owner seeks to ignore the Specification and Examiner's use of the term "extension" in connection with structures other than the central ramp (*see, e.g.*, Prelim. Sur-reply 4), but on this record nothing indicates that the patentee intended a special definition for the term "extension" in the context of the central ramp.

For purposes of this Decision, we apply the plain and ordinary meaning of the term "extension," i.e., "an addition to a main structure." *See* Ex. 3001, 4. This construction is consistent with the broad use of the term "extension" in the Specification to refer to a variety of additions to a main structure having a variety of shapes.

2. "*expansion portion*" (*Independent Claims 1, 10, 15*)

Patent Owner asserts that the plain and ordinary meaning of "expansion portion" (as recited in independent claims 1, 10, and 15) is "a portion with an angled surface that facilitates expansion." Prelim. Resp. 41. Patent Owner contends that this construction is consistent with the parties' agreed construction in the pending litigation for the same term in U.S. Patent No. 10,925,752—a patent that is not related to the '731 patent, but which Patent Owner contends has a "substantively identical" specification. *Id.* at 41 n.8. Patent Owner also appears to argue that according to the Specification, an "expansion portion" is a portion of the central ramp having

one or more angled or ramped surfaces. *See id.* at 43–45 (citing, *e.g.*, Ex. 1001, Figs. 25, 27, 46, 52).

On this record Patent Owner does not persuade us that the plain and ordinary meaning of the term “expansion portion” requires “an angled surface.” First, Patent Owner does not adequately explain why we should adopt an agreed construction in an unrelated proceeding based on an unrelated patent. Second, the plain and ordinary meaning of the term “expansion portion” is, as the phrase itself suggests, a “portion that facilitates expansion.” *See also* Ex. 3001, 4 (indicating that “expansion” means “[t]he act or process of expanding”). Nothing in this plain meaning suggests an angled surface. Patent Owner does not adequately explain why the example embodiments depicted in the Specification should be understood to limit the claims, given the Federal Circuit’s guidance that “a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.” *SuperGuide Corp. v. DirecTVEnters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004); *see also Phillips*, 415 F.3d at 1323 (“[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.”).

For purposes of this Decision, we apply the plain and ordinary meaning of the term “expansion portion,” i.e., a “portion that facilitates expansion.”

3. “*complementary with one another*” (Independent Claim 10)

Patent Owner appears to argue that “complementary with one another” (which appears in independent claim 10¹⁰) means “mat[ing] with one another in a beneficial way.” Prelim. Resp. 90. Patent Owner argues that this construction is consistent with the Specification’s discussion of “complementary texturing or engagement features” and with use of the term “complementary” in a variety of other references. *See id.* at 86–87 (citing, e.g., Ex. 1001, 8:34–40; Ex. 2001 (Culbert Decl.) ¶¶ 164–65; Ex. 1006 ¶¶ 88, 89; Ex. 1007 ¶ 30; Ex. 1016, 24:22–27). Patent Owner also asserts that its construction is consistent with the prosecution history, wherein the applicant “specifically added the disputed claim language to the claims to exclude the ‘mirrored’ ramp surfaces identified by the Examiner.” *Id.* at 90; *see also id.* at 88–90 (citing Ex. 1004, 264, 246, 248, 251).

We find that Patent Owner’s proposed construction of “mat[ing] with one another in a beneficial way” imports into the claim a subjective requirement of “beneficial” mating that does not appear to be grounded in the intrinsic record and appears to be inconsistent with the plain and ordinary meaning of the term “complementary.” The Specification uses the term “complementary” only once, stating in reference to Figure 17 that “the lower surfaces 104 have complementary texturing or engagement features on their surfaces to engage with the texturing or engagement features on the upper endplate 14 and the lower endplate 16 of the fusion device 10.” Ex. 1001, 8:36–40. On this record, Patent Owner has not adequately explained,

¹⁰ Patent Owner mistakenly identifies this term as appearing in claim 15. *See* Prelim. Resp. 85.

nor do we otherwise discern, how this statement supports Patent Owner’s subjective requirement of “beneficial” mating.

At this stage, we determine that the plain and ordinary meaning of “complementary with one another” is “completing one another.” *See, e.g.*, Ex. 3001, 3 (defining “complementary” as “Forming or serving as a complement; completing.”). This meaning is consistent with (1) the Specification’s description of “complementary” texturing or engagement features (Ex. 1001, 8:34–40); (2) the prosecution history cited by Patent Owner (*see* Prelim. Resp. 88–90; Ex. 1004, 264, 246, 248, 251, where the applicant added the “complementary with one another” limitation, pointing to Figure 40 in support, and argued that this amendment distinguished Olmos’s mirrored ramps); and (3) uses of the term “complementary” in other art of record, as cited by Patent Owner (*see* Prelim. Resp. 87; Ex. 1006 ¶¶ 88 (discussing “complementary” retention structures that engage each other), 89 (discussing a spline “for cooperating with a complementary keyway”); Ex. 1007 ¶ 30 (discussing “upper and lower sections” of a spinal fusion device that “move along the complementary inclined plane to . . . increase the distance between the end plates of the adjacent vertebrae”); Ex. 1016, 24:22–27 (discussing profile of columnar body of a fusion block as being generally complementary to the profile of the inter-vertebral elements of a disc implant)). This construction, however, avoids the subjective language (“beneficial”) in Patent Owner’s proposal.

For purposes of this Decision, we apply the plain and ordinary meaning of the term “complementary with one another,” i.e., “completing one another.”

E. Overview of Asserted Prior Art

1. Chung (Ex. 1005)

Chung, titled “A lumbar holder,” relates “to a medical device for correcting the back.” Ex. 1004, code (54), 2, 4. Chung discloses “a lumbar holder that is inserted between the back bones consisting of the lumbar in order to fix the back bones robustly while freely adjusting the height in order to maintain the appropriate space according to the patient’s state.” *Id.* at 4.

Figure 1 of Chung, reproduced below, is a perspective view of a lumbar holder. *Id.* at 3.

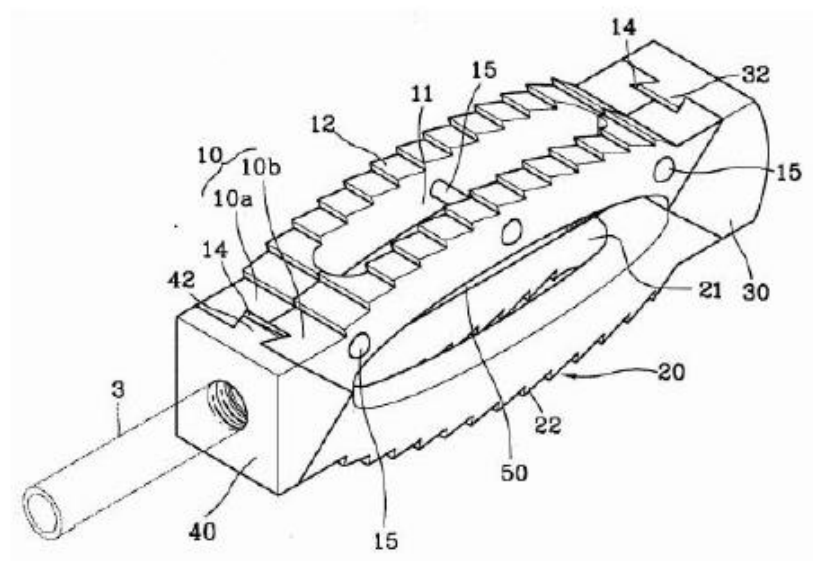


Figure 1 of Chung, reproduced above, depicts main holder bodies 10 and 20, lead wedge 30, and opposing wedge 40. *Id.* at 6.

Figure 2 of Chung, reproduced below, is an exploded view of the lumbar holder in Figure 1 above.

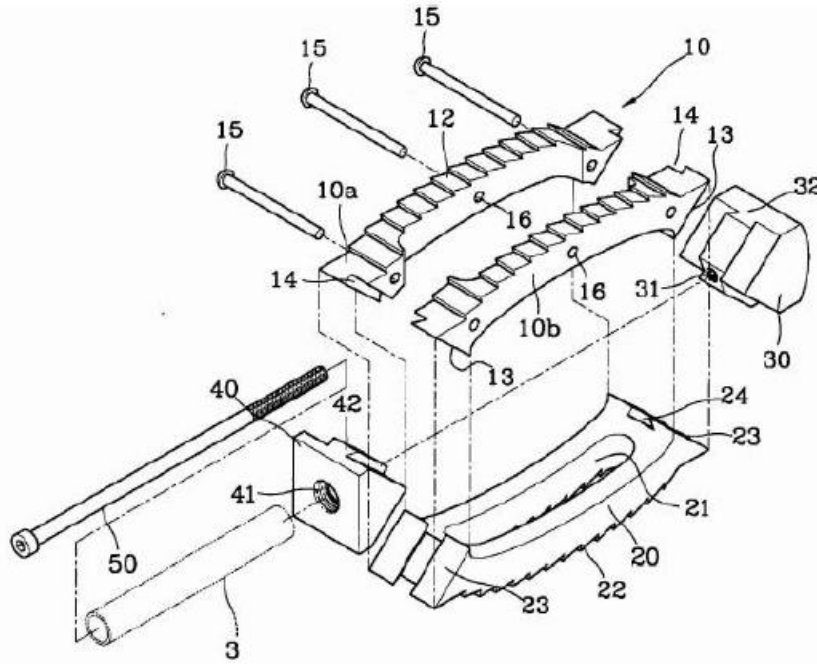


Figure 2 of Chung, reproduced above, depicts groove fastening screw 50, which fastens to screw hole 31 of lead wedge 30. *Id.* at 6. Opposing wedge 40 has penetrating hole 41, which has a raised spot to hold the head of groove fastening screw 50. *Id.* at 7. Tightening or loosening groove fastening screw 50 adjusts the distance between lead wedge 30 and opposing wedge 40, which slide along guiding surfaces 13 and 23 of holder bodies 10 and 20 to widen or narrow the space between the holder bodies. *Id.* at 6–7.

Figure 4 of Chung is reproduced below.

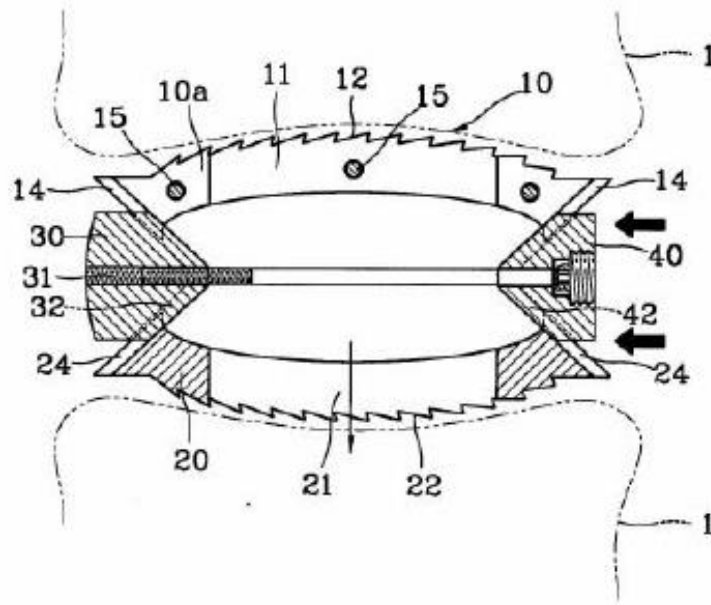


Figure 4 of Chung, reproduced above, is a cross-section view of a lumbar holder inserted between back bones. Chung discloses that, in operation, the lumbar holder is inserted between back bones and a wrench is used to tighten groove fastening screw 50, which brings lead wedge 30 and opposing wedge 40 together such that the wedges push main holder bodies 10 and 20 outward into contact with the back bones. *Id.* at 7. Conversely, loosening groove fastening screw 50 moves lead wedge 30 and opposing wedge 40 apart, which pulls main holder bodies 10 and 20 together. *Id.*

2. Baynham (Ex. 1007)

Baynham, titled “PLIF Opposing Wedge Ramp,” relates to “implants to be placed between vertebrae in the spine.” Ex. 1007, code (54), ¶ 3. Baynham discloses a spinal fusion implant for implantation between vertebrae. *Id.*, code (57).

Figure 1 of Baynham is reproduced below.

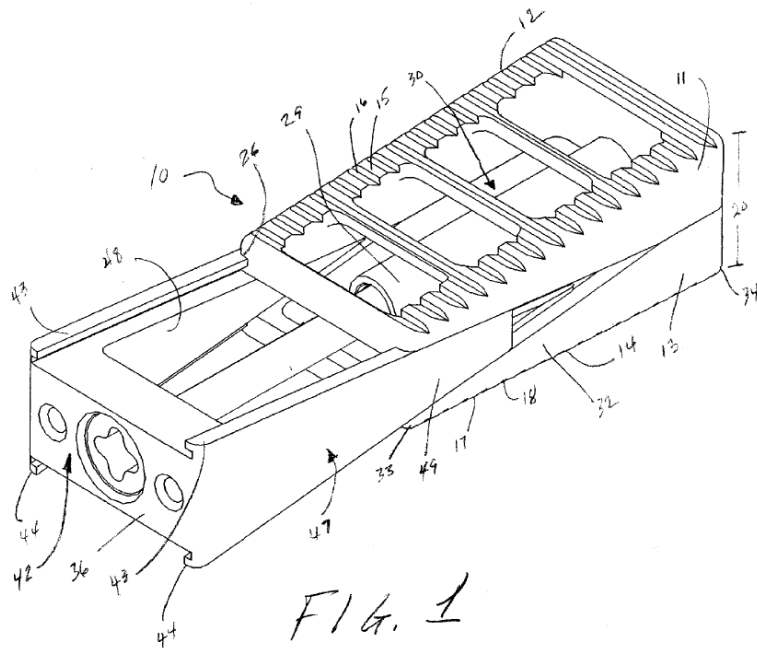


Figure 1 of Baynham, reproduced above, is a perspective view of spinal fusion device 10 comprising upper section 11 with top surface 12 and lower section 13 with bottom surface 14. *Id.* ¶ 22. Distractor 42 is between upper section 11 and lower section 13. *Id.* ¶ 28.

Figure 3 of Baynham is reproduced below.

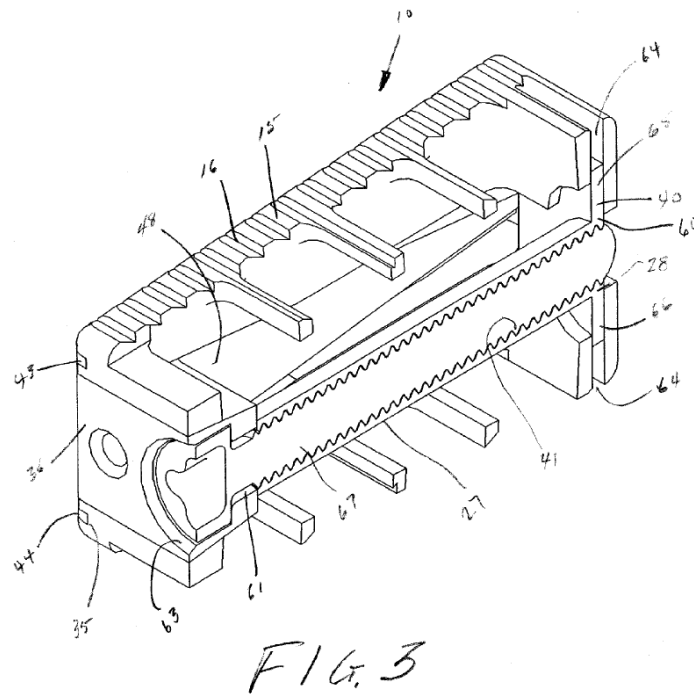


Figure 3, reproduced above, is a cross-section view of spinal fusion device 10 including jack screw 67, which is inserted through bore 61 of disruptor 42. *Id.* ¶ 29. Jack screw 67 engages internal threads in tube 27 of link 40. *Id.* ¶ 25. Tightening jack screw 67 draws disruptor 42 between the upper and lower sections 11 and 13, increasing the distance between sections. *Id.*

3. Olmos (*Ex. 1006*)

Olmos, titled “Intervertebral Implant,” relates to “[a]n adjustable spinal fusion intervertebral implant.” *Ex. 1006*, code (54), (57). Figure 16A of Olmos is reproduced below.

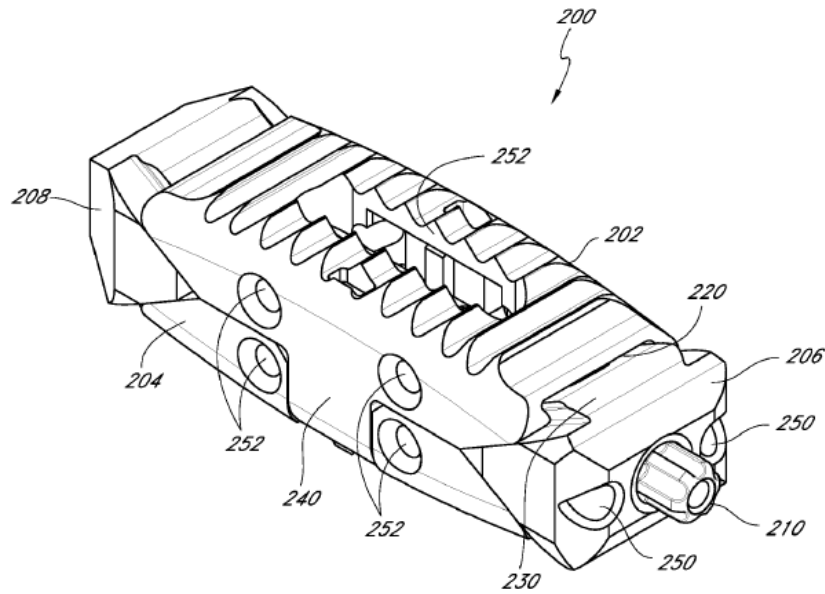


FIG. 16A

Figure 16A of Olmos, reproduced above, is a perspective view of intervertebral implant 200 in an unexpanded state. *Id.* ¶ 152. Implant 200 comprises upper body portion 202, lower body portion 204, proximal wedge member 206, distal wedge member 208, and actuator shaft 210. *Id.* ¶¶ 152, 156. Proximal wedge member 206 includes upper guide member 230 engaging a corresponding slot in upper body portion 202 to enhance stability. *Id.* ¶ 156; *see also id.* (describing that proximal wedge member 208 includes a similar feature).

Figure 18 of Olmos is reproduced below.

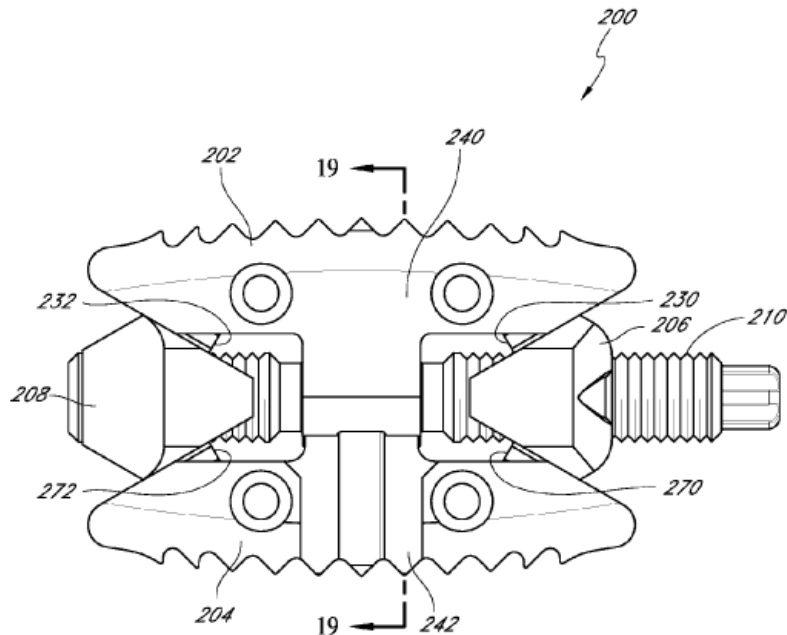


FIG. 18

Figure 18 of Olmos, reproduced above, is a side view of intervertebral implant 200 in an expanded state. *Id.* ¶ 168. Actuator shaft 210 includes threads to engage at least one of the proximal and distal wedge members 206 and 208. *Id.* ¶ 159. Rotating actuator shaft 210 causes proximal and distal wedge members 206 and 208 to move towards each other and separate upper and lower body portions 202 and 204. *Id.* ¶ 155. Proximal wedge member 206 includes upper guide member 230 and lower guide member 270 and distal wedge member 208 includes upper guide member 232 and lower guide member 272. *Id.* ¶¶ 156, 167. Olmos discloses that the slots and guide members may have a dovetail shape to ensure secure engagement between the wedge members and the body portions. *Id.* ¶ 167.

F. Ground 1 – Alleged Anticipation by Chung

For Ground 1, Petitioner asserts that claims 1–15 are unpatentable as anticipated by Chung. Pet. 6–62. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 32–48, 76–83, 85–95.

For the reasons discussed below, on this record we determine that Petitioner has shown a reasonable likelihood of establishing that at least claim 15 is unpatentable as anticipated by Chung. We have reservations, however, as to whether Petitioner has shown a reasonable likelihood of establishing that claims 1–14 are unpatentable as anticipated by Chung.

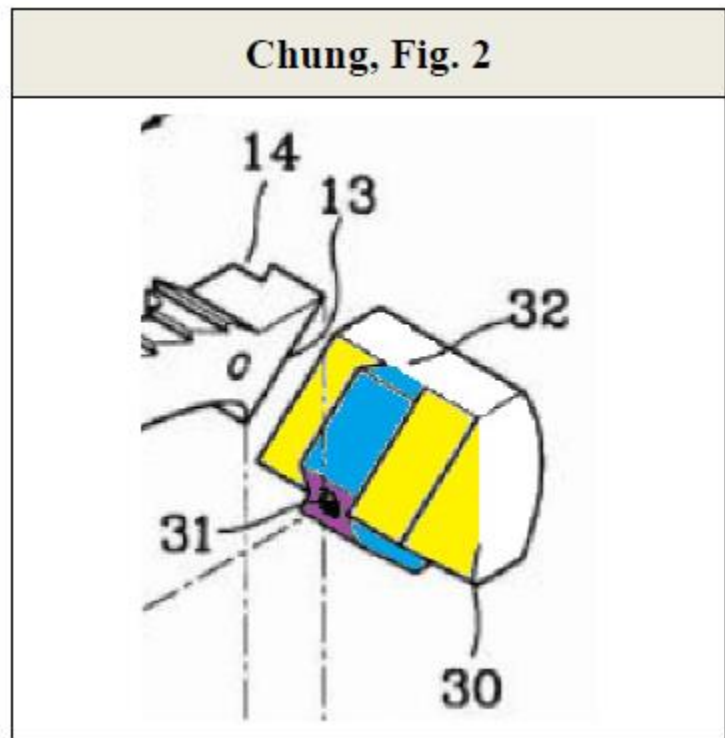
1. Analysis of Independent Claim 1

Petitioner provides a limitation-by-limitation analysis alleging that Chung discloses an intervertebral implant meeting each and every limitation of challenged claim 1. See Pet. 7–22. At this stage of the proceeding, Patent Owner disputes only Petitioner’s contentions regarding limitations 1[h] (relating to an “expansion portion” and “extension” of the central ramp, where the “extension extend[s] in a longitudinal axis from the expansion portion”) and 1[j] (relating to an “unthreaded” opening in the driving ramp). See Prelim. Resp. 32–47, 93–95.

After considering all of the arguments and evidence of record, we determine that for purposes of institution, Petitioner has sufficiently shown that Chung discloses an intervertebral implant that teaches limitations 1[a]–1[g] and 1[i]–1[k]. See Pet. 6–14, 17–19, 21–22. We have reservations, however, as to whether Petitioner has sufficiently shown that Chung teaches limitations 1[h]. We discuss limitations 1[h] and 1[j] below.

a. Limitation 1[h]: wherein the central ramp comprises an expansion portion and an extension, the extension extending in a longitudinal axis from the expansion portion

Petitioner maps (i) Chung's "lead wedge (30)" to the claimed "central ramp;" (ii) Chung's ramped surfaces that flank dovetail (32) to the claimed "expansion portion;" and (iii) Chung's "dovetail (32)" to the claimed "extension." See Pet. 14–15. To illustrate, we reproduce below Petitioner's annotated excerpt of Chung's Figure 2:



Pet. 15. Petitioner's annotated excerpt of Chung's Figure 2, reproduced above, shows Chung's lead wedge (30). Petitioner highlighted dovetail (32) (which Petitioner maps to the claimed "extension") in blue, and highlighted the ramped surfaces that flank dovetail (32) (which Petitioner maps to the claimed "expansion portion") in yellow. See *id.* at 14–15; see also *id.* at 17 (citing Ex. 1002 (Drewry Decl.) ¶¶ 104–12).

Limitation 1[h] has several parts; we address in turn below the “extension” limitation, and separately, the “extension extending in a longitudinal axis from the expansion” portion.

i. extension

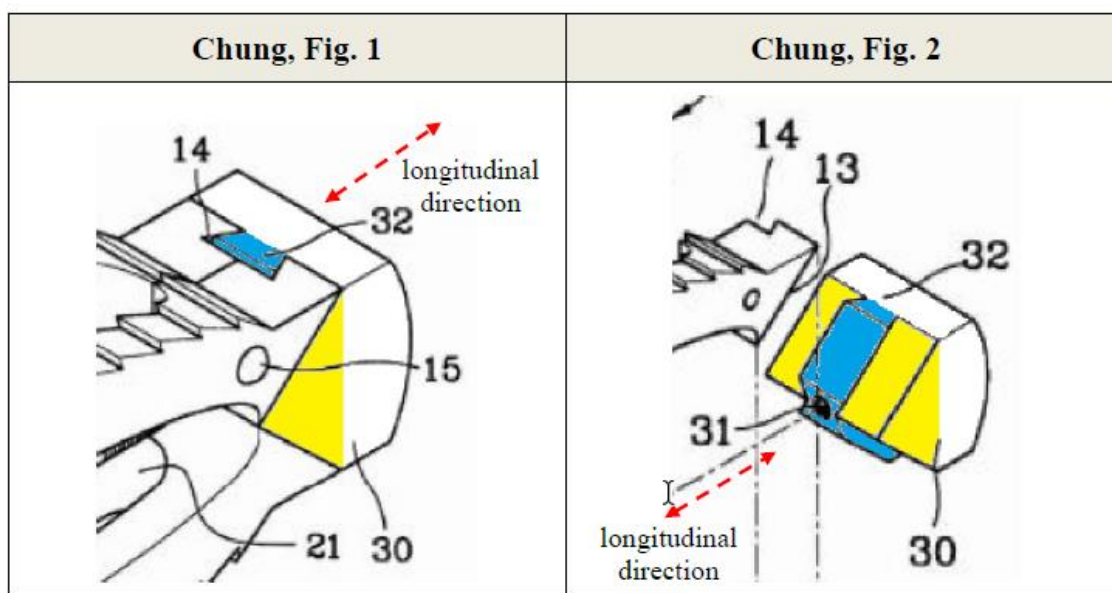
Patent Owner disputes that Chung discloses the claimed extension. *See, e.g.*, Prelim. Resp. 32–40. This argument is largely based on Patent Owner’s proposed construction of “extension,” which as discussed above, is “a structure that increases the length of the central ramp.” *See supra* Section II.D.1. Patent Owner also contends that a person of ordinary skill in the art would have recognized Chung’s dovetail 32 (the blue structure in Petitioner’s annotated excerpt of Chung’s Figure 2 reproduced above) to map to the claimed “expansion portion,” not the claimed “extension,” and argues that during prosecution, the Examiner never identified any part of Olmos’s guide 232 (which is similar to Chung’s lead wedge (30)) as the claimed “extension.” *See, e.g.*, Prelim. Resp. 35, 38.

On this record, we find Patent Owner’s arguments unavailing. Under our preliminary construction of “extension” as meaning “an addition to a main structure,” we find for purposes of institution that Chung’s dovetail 32 is “an addition to a main structure.” In particular, claim 1 recites that the central ramp comprises an extension. Here, Petitioner has sufficiently shown for purposes of institution that Chung’s “dovetail (32)” teaches the claimed “extension” because it is an addition to central ramp/lead wedge (30). This can be seen, for example, in Petitioner’s annotated excerpt of Chung’s Figure 2, reproduced above, where dovetail (32) protrudes below the bottom surface of lead wedge (30) (i.e., in a direction that is acute to the longitudinal axis).

Accordingly, for purposes of institution, Petitioner has sufficiently shown that Chung’s “dovetail (32)” teaches the claimed “extension.”

ii. the extension extending in a longitudinal axis from the expansion portion

Petitioner contends that Chung’s extension/dovetail (32) “extends in a longitudinal axis from the expansion portion.”¹¹ Pet. 15. To illustrate, we reproduce Petitioner’s annotated excerpts of Chung’s Figures 1 and 2:



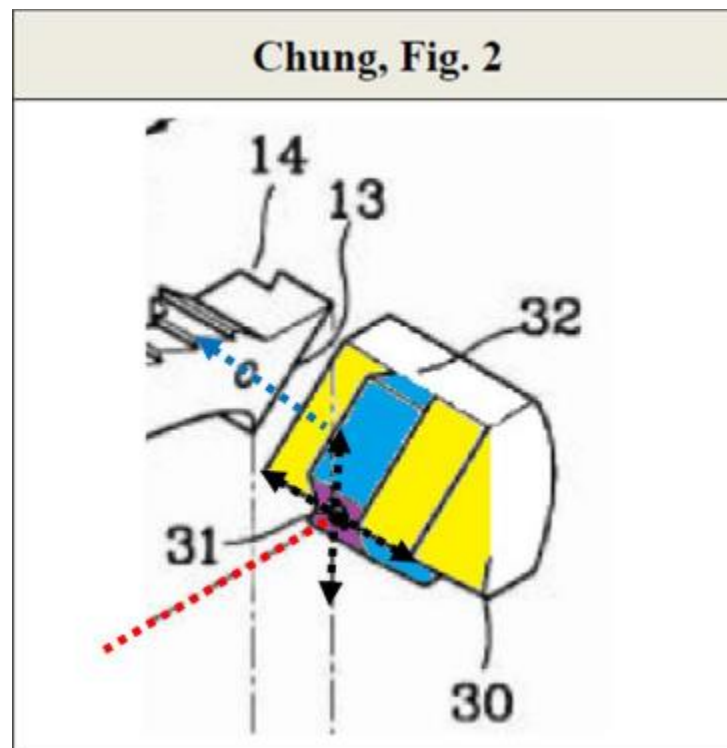
Pet. 17. Petitioner asserts that the annotated excerpts of Chung’s Figures 1 and 2 reproduced above demonstrate that dovetail (32) (colored blue) extends from the surface of lead wedge (30) in the longitudinal direction, as indicated by the dashed red arrow. *See id.* at 16–17.

On this record, Petitioner’s argument is not persuasive. In pertinent part, limitation 1[h] recites that the “extension extend[s] in a longitudinal axis *from the expansion portion.*” Ex. 1001, 21:9–11 (emphasis added).

¹¹ This limitation appears only in independent claim 1. It does not appear in independent claims 10 and 15.

Petitioner's annotated excerpt of Chung's Figure 1 (reproduced above on the left) does not appear to show that extension/dovetail (32) extends in a longitudinal direction *from* the expansion portion (yellow). Instead, it terminates in the longitudinal direction at or before the edges of the expansion portion (yellow).

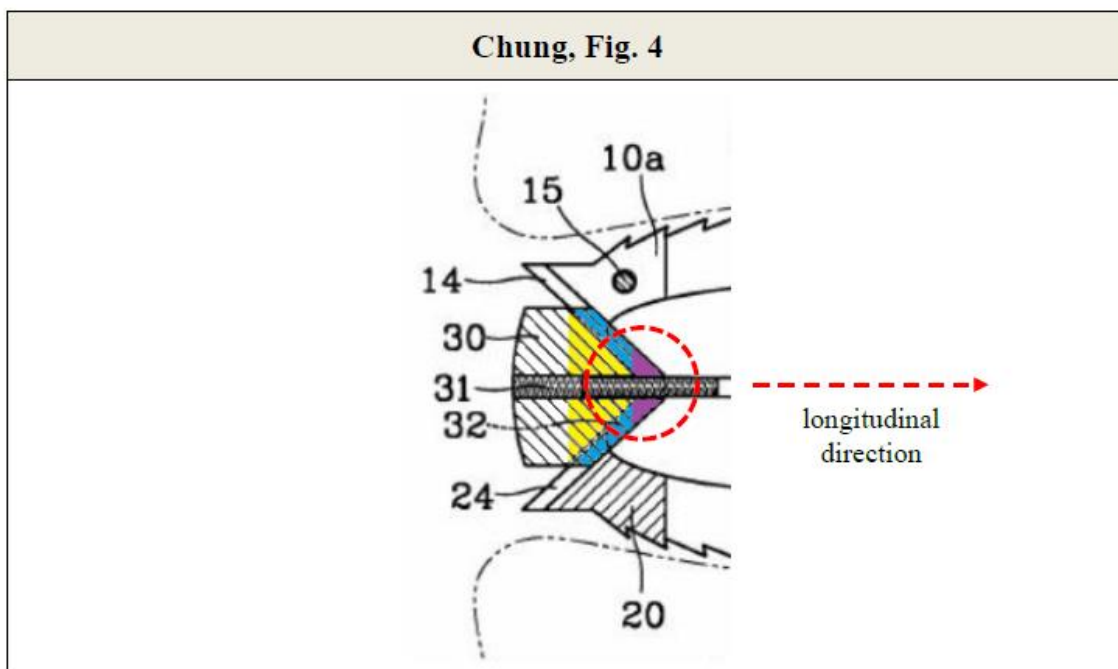
Additionally, on this record, we find that the annotated excerpt of Chung's Figure 2 is inconclusive as to whether extension/dovetail (32) extends in a longitudinal direction from the expansion portion (yellow). Based on the excerpt of Chung's Figure 2, it is equally likely that the structures colored blue and yellow terminate in the same plane, as shown in Patent Owner's further annotated excerpt of Chung's Figure 2, reproduced below:



Prelim. Resp. 77. In Patent Owner's further annotated excerpt of Chung's Figure 2 reproduced above, Patent Owner demonstrates that Chung's

dovetail (blue) protrudes in a direction (shown by the blue dashed arrow) that is acute to the longitudinal axis (red dashed line), but does not appear to extend in a longitudinal direction past the plane where the expansion portion (yellow) terminates. *See id.* On this record, we find Patent Owner’s interpretation of Chung Figure 2 more plausible than Petitioner’s.

Petitioner also relies on an annotated excerpt of Chung’s Figure 4, which we reproduce below:



Pet. 16. Petitioner contends that the annotated excerpt of Chung’s Figure 4, reproduced above, shows that “a portion of dovetail (32),” which is highlighted in purple, “extends longitudinally from ‘lead wedge (30)’ [highlighted in yellow] and receives the actuation member.” *Id.* at 15–16.

Patent Owner argues that Petitioner’s annotations to this figure are misleading. Prelim. Resp. 79. Patent Owner explains that “Chung teaches that ‘Figure 4 is a cross-sectional diagram’ (Ex-1005, 3) which means it is depicting the lead wedge 30 cut in half and viewed directly from the side,

resulting in only the central layer of material in the lead wedge 30 being visible.” *Id.* at 80 (citing Ex. 2001 (Culbert Decl.) ¶ 183). Patent Owner argues that in a cross-section view, the yellow structure would be hidden behind the exposed central layer, “making it impossible for that figure [Chung’s Figure 4] to depict the blue extending beyond the yellow,” as shown in Petitioner’s annotations. *Id.* at 82.

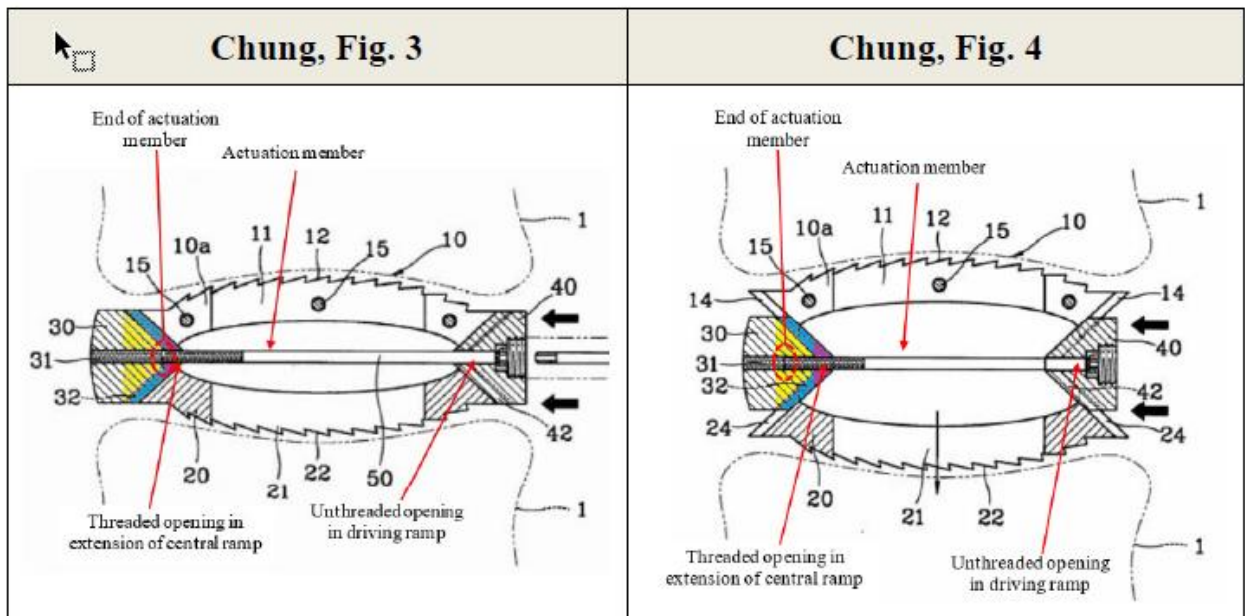
On this record, we agree with Patent Owner that Petitioner has inaccurately annotated Chung’s Figure 4. As Patent Owner explains, given that Chung’s Figure 4 is “a cross-sectional diagram” (Ex. 1005, 3), the yellow structures would not be visible for the reasons Patent Owner explains on pages 80–82 of the Preliminary Response. In other words, properly annotated, the yellow portion of Petitioner’s annotated version of Chung Figure 4 should actually be highlighted in blue, because the expansion portions of lead wedge 30 (which Petitioner highlighted in yellow in Chung Figure 2) are hidden behind the central layer material of the lead wedge 30 in Chung’s Figure 4. *See* Prelim. Resp. 80–82. Accordingly, on this record we find that Chung’s Figure 4 does not support Petitioner’s contention that extension/dovetail (32) “extends in a longitudinal axis from the expansion portion” as claimed.

In sum, on this record we have reservations as to whether Petitioner has adequately shown a reasonable likelihood that Chung teaches that “the extension extend[s] in a longitudinal axis from the expansion portion.”

b. Limitation 1[j]: wherein the actuation member extends through an unthreaded opening in the driving ramp and extends into a threaded opening in the extension of the central ramp

The parties dispute whether Chung teaches the portion of limitation 1[j] that recites “the actuation member extends through **an unthreaded opening** in the driving ramp.” See, e.g., Pet. 19–20; Prelim. Resp. 93–95.

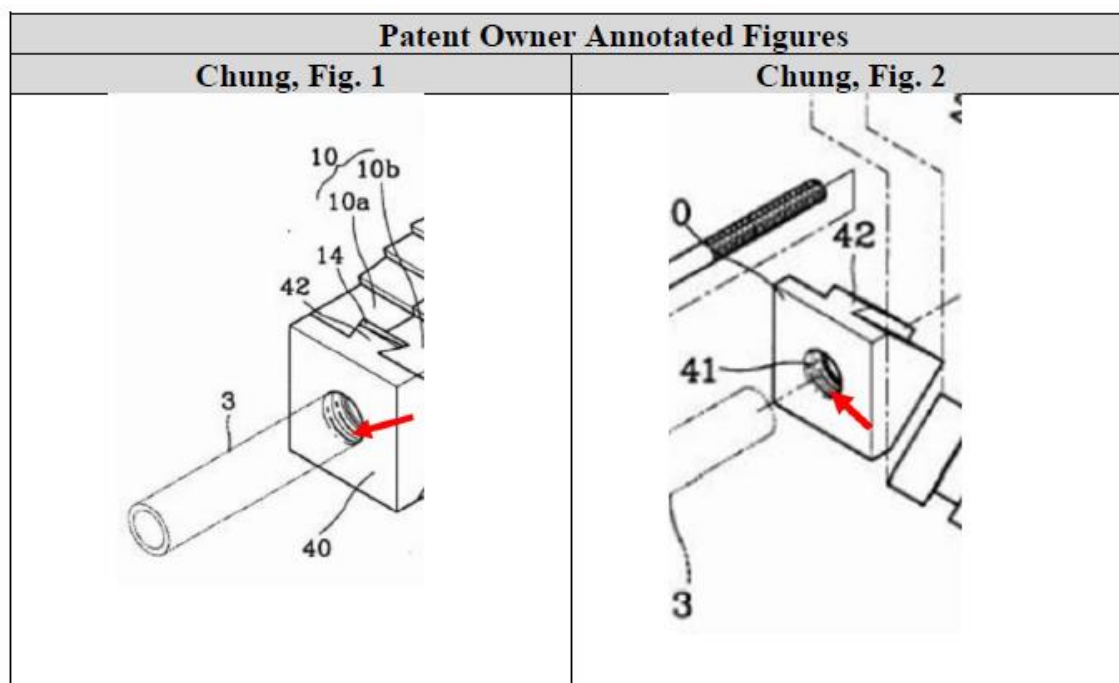
Petitioner contends that Chung discloses that the driving ramp (opposing wedge 40) includes an **unthreaded opening** (penetrating hole 41) for the actuation member (groove fastening screw 50), while the central ramp (lead wedge 30) includes a threaded opening (screw hole 31) for engaging with the actuation member. Pet. 19–20 (citing Ex. 1005, 6); see also *id.* at 20 (citing Ex. 1002 (Drewry Decl.) ¶¶ 117–21). In support of this contention, Petitioner relies on annotated versions of Chung’s Figures 3 and 4, which we reproduce below:



Pet. 20. Petitioner’s annotated versions of Chung’s Figures 3 and 4, reproduced above, depict Chung’s lumbar holder, with annotations calling

out (among other things) “unthreaded opening (penetrating hole 41)” in opposing wedge 40 on the right side of the lumbar holder, and “threaded opening (screw hole 31)” in central ramp/lead wedge 30 on the left side of the lumbar holder. *See id.*

Patent Owner responds that penetrating hole (41) in fact has threads, which “are clearly visible in [Chung’s] Figures 1 and 2.” Prelim. Resp. 93–94. We reproduce below Patent Owner’s annotated excerpts of Chung’s Figures 1 and 2:



Id. at 94. In Patent Owner’s annotated excerpts of Chung’s Figures 1 and 2, reproduced above, Patent Owner adds red arrows to penetrating hole (41) to demonstrate that it has threads. *See id.* at 93–94. Patent Owner argues that “[b]ecause penetrating hole (41) clearly has threads, a POSITA would not understand it to satisfy the ‘unthreaded opening’ requirement of the independent claims.” *Id.* at 94; *see also* Ex. 2001 (Culbert Decl.) ¶¶ 191–95.

Although a close call, on this record, we determine for purposes of institution that Petitioner has the better argument. First, Chung itself distinguishes “screw” holes and “penetrating” holes. *See, e.g.*, Ex. 1005, 3; Ex. 1002 (Drewry Decl.) ¶ 117. This terminology suggests that “screw” holes have threads, whereas “penetrating” holes are not screw holes and therefore do not. Second, on this record we credit Mr. Drewry’s opinion that when comparing Chung’s Figures 3 and 4, a person of ordinary skill in the art would “understand that the opening in central ramp (30) is threaded such that it will receive the actuation member/groove fastening screw (50) and move inwards or outwards in response to the screw being rotated, while the opening in driving ramp (40) is unthreaded as evidenced by the fact that screw (50) does not move with respect to the driving ramp when rotated.” Ex. 1002 (Drewry Decl.) ¶ 118; *see also id.* ¶ 119.

Regarding the threading identified by Patent Owner, on this record we credit Mr. Drewry’s testimony that “any threading present on opening (41) would only engage with the pipe wrapper (3) and not the actuation member, and a POSITA would have understood that opening (41) was unthreaded in relation to the actuation member.”¹² *Id.* ¶ 120. Contrary to Mr. Culbert’s testimony, we preliminarily find the fact that the threading is designed to engage with pipe wrapper (3), rather than the actuation member, is relevant. Ex. 2001 (Culbert Decl.) ¶ 193. This is because, despite passing through a

¹² Patent Owner argues that the rationale in paragraph 120 of Mr. Drewry’s Declaration does not appear in the Petition, and thus is improperly incorporated by reference. Prelim. Resp. 94. We disagree. At a minimum, Petitioner is entitled to rely on this material in rebuttal to Patent Owner’s arguments regarding threading in opening 41.

threaded hole that engages with pipe wrapper (3), “Chung’s actuation member [nevertheless] extends through an unthreaded opening in wedge (40), which is all that is required by this claim element.” Ex. 1002 (Drewry Decl.) ¶ 120.

c. Conclusion on Claim 1

On this record, we have reservations as to whether Petitioner has shown a reasonable likelihood that claim 1 is anticipated by Chung because we have reservations as to whether Petitioner has shown a reasonable likelihood that Chung teaches an extension that “extends in a longitudinal axis from the expansion portion.”

2. Independent Claim 10

Petitioner provides a limitation-by-limitation analysis as to how Chung allegedly discloses an intervertebral implant meeting each and every limitation of independent claim 10. See Pet. 44–52. At this stage of the proceeding, Patent Owner disputes only Petitioner’s contentions regarding limitation 10[f]’s recitation of an “extension,” and limitation 10[e], the “complementary with one another” limitation.¹³ See Prelim. Resp. 32–47, 85–93.

After considering the arguments and evidence of record, we determine that for purposes of institution, Petitioner has sufficiently shown that Chung discloses an intervertebral implant that teaches all limitations of claim 10,

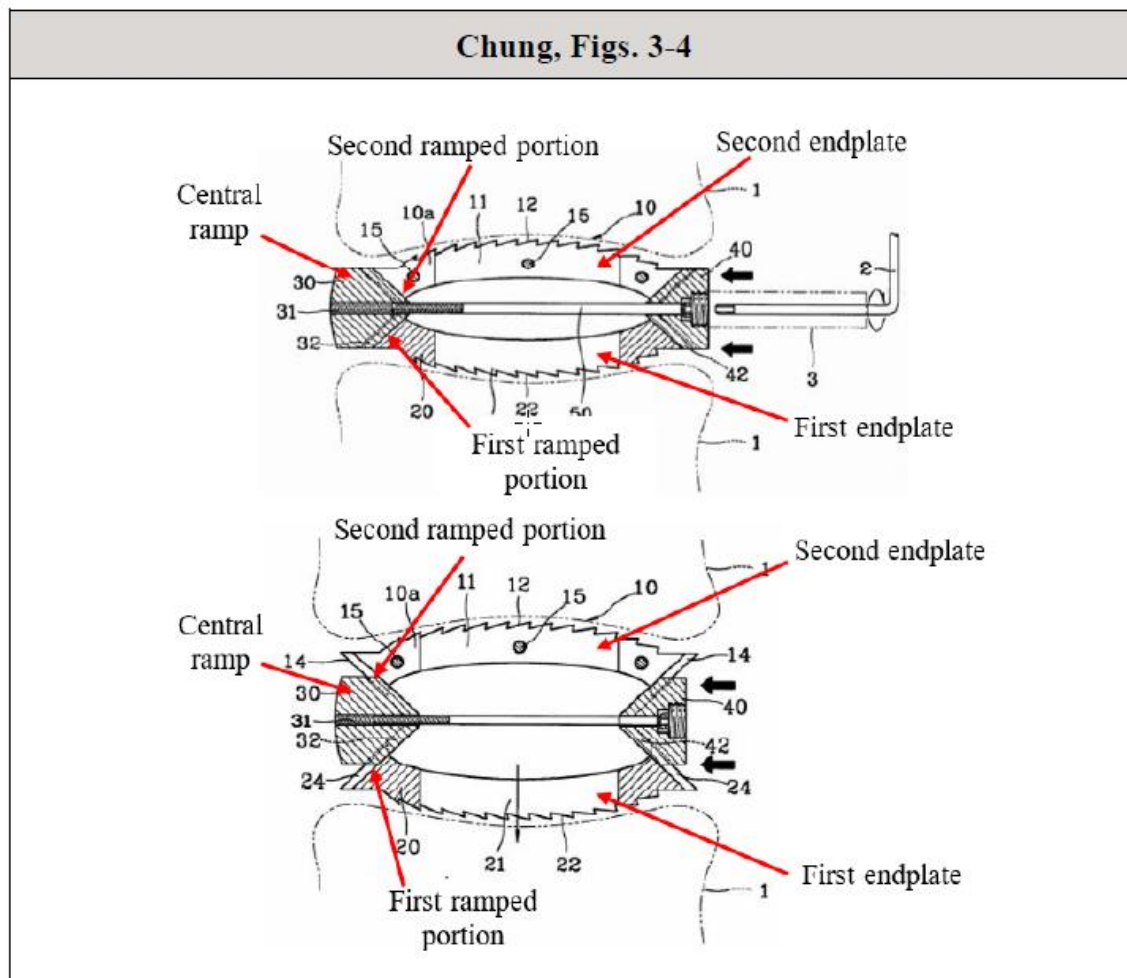
¹³ Limitation 10[f] recites: “a central ramp comprising an expansion portion and an **extension portion** extending from the expansion portion.” Pet. 132 (emphasis added). Limitation 10[e] recites: “the first ramped portion of the first endplate and the second ramped portion of the second endplate are **complementary with one another**.” *Id.* (emphasis added).

except we have reservations regarding limitation 10[e], the “complementary with one another” limitation.¹⁴ See Pet. 44, 46–52.

The arguments and evidence of record for limitation 10[f]’s “extension” are the same as for the “extension” of claim 1. See, e.g., Pet. 46, Prelim. Resp. 32–47. Thus, we refer back to our analysis above (*see supra* Section II.F.1.a.i) in determining that Petitioner has sufficiently shown for purposes of institution that Chung teaches the claimed “extension.”

Turning to the “complementary with one another” limitation, Petitioner argues that Chung teaches this limitation because Chung’s lumbar holder has endplates with ramped portions that “have the same angle mirroring each other.” Pet. 45. This is illustrated in Petitioner’s annotated versions of Chung’s Figures 3 and 4, which we reproduce below:

¹⁴ This limitation appears only in independent claim 10. It does not appear in independent claims 1 and 15.



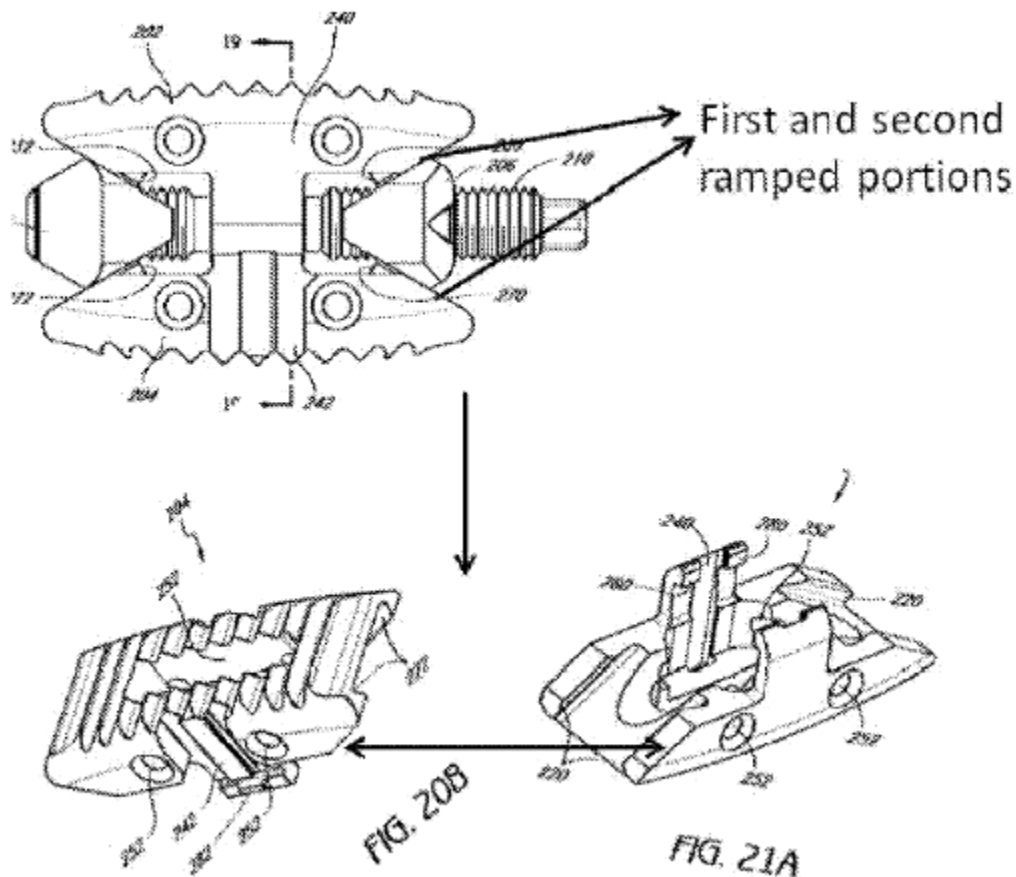
Ex. 1002 (Drewry Decl.) ¶ 183. Petitioner’s annotated versions of Chung’s Figures 3 and 4, reproduced above, show Chung’s lumbar holder with red arrows pointing to the central ramp/lead wedge (30) and first and second endplates having first and second ramped portions. *See id.* Mr. Drewry opines that Chung’s first and second ramped portions “are complementary with one another, in that they are mirrored by having the same angles across the horizontal plane between them, and that they engage the top and bottom sloped surfaces of the ramp in a generally identical way and causing generally symmetrical expansion of the device.” *Id.* Petitioner further asserts that during prosecution the Examiner understood that

“complementary with one another” encompasses ramped portions having angles that mirror each other. Pet. 45 (citing Ex. 1004, 35–38, 40–43, 55, 57, 68, 70, 79–82, 98–100, 109–11, 113–14, 120–22, 142–43, 237–40).

Patent Owner responds that mirrored surfaces are the “*opposite of complementary*,” because “they cannot engage in a way that enhances their engagement.” Prelim. Resp. 86 (citing Ex. 2001 (Culbert Decl.) ¶ 163).

On the current record, we agree with Patent Owner that the ramps Petitioner relies on in Chung are not “complementary with one another” as claimed. As discussed above, we preliminarily construe this term to mean “completing one another.” *See supra* Section II.D.3. On this record, we preliminary find that Chung’s first and second ramp portions, which are mirrored by having the same angles across the horizontal plane between them, do not complete each other.

We are not persuaded by Petitioner’s arguments that its mapping is correct because the Examiner construed “complementary with one another” to encompass ramps like Chung’s first and second ramp portions that mirror each other. Pet. 45. First, many of the citations in the string cite Petitioner offers to support its argument do not appear to address the “complementary with one another” term. *See id.* (citing Ex. 1004, 35–38, 40–43, 55, 57, 68, 70, 79–82, 98–100, 109–11, 113–14, 120–22, 142–43, 237–40). Second, we agree with Patent Owner that after the applicant amended the claims to add the “complementary with one another” limitation, “the Examiner resorted to identifying hypothetical orientations of the end plates as complementary,” e.g., providing the annotated figures reproduced below and stating that “one **can** orient the first and second ramped portions [of Olmos] such that they are complementary with one another”:



Prelim. Resp. 91 (quoting Ex. 1004, 238–39); *see also id.* at 91–92 (addressing similar Examiner comments related to Biedermann). In the annotated figures above, the Examiner highlights “first and second ramped portions” of Olmos’s device that mirror each other, then shows how, if the device is disassembled, the ramps can be positioned to fit over each other. *See id.* To the extent the Examiner considered ramps that mirror each other to be complementary, that rationale at best comports with the “broadest reasonable interpretation” standard the Examiner was required to apply and not the *Phillips* claim construction standard applicable here. *See id.* at 90–91.

For the above reasons, we have reservations as to whether Petitioner has shown a reasonable likelihood that Chung teaches the “complementary with one another” limitation and thus anticipates claim 10.

3. Independent Claim 15

Petitioner provides a limitation-by-limitation analysis as to how Chung allegedly discloses an intervertebral implant meeting each and every limitation of independent claim 15. *See* Pet. 57–62. At this stage of the proceeding, Patent Owner disputes only Petitioner’s contentions regarding limitation 15[g]’s recitation of an “extension.”¹⁵ *See* Prelim. Resp. 32–47.

After considering all of the arguments and evidence of record, we determine that for purposes of institution, Petitioner has sufficiently shown that Chung discloses an intervertebral implant that teaches all limitations of claim 15. *See* Pet. 57–62. The arguments and evidence for limitation 15[g]’s “extension” are the same as for the “extension” of claim 1. *See, e.g.,* Pet. 58, Prelim. Resp. 32–47. Thus, we refer back to our analysis above (*see supra* Section II.F.1.a.i) in determining that Petitioner has sufficiently shown for purposes of institution that Chung teaches the claimed “extension.”

On this record, Petitioner has shown a reasonable likelihood of establishing that claim 15 is anticipated by Chung. On that basis, we institute an *inter partes* review of all challenged claims. *See SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348, 1358 (2018); 37 C.F.R. § 42.208(a) (“When instituting post-grant review, the Board will authorize the review to proceed

¹⁵ Limitation 15[g] recites: “wherein the central ramp comprises an expansion portion and **an extension**, the extension extending from the expansion portion and having a threaded opening for receiving the threaded portion of the actuation member.” Pet. 134 (emphasis added).

on all of the challenged claims . . .”). Below we address Petitioner’s remaining challenges.

4. Dependent Claims 2–9 and 11–14

Claims 2–9 depend directly or indirectly from claim 1, and claims 11–14 depend directly or indirectly from claim 10. Patent Owner did not specifically address any of these dependent claims. *See generally* Prelim. Resp.

Petitioner’s arguments for dependent claims 2–9 and 11–14 do not overcome the issues we discussed above regarding Petitioner’s arguments for independent claims 1 and 10. Accordingly, for at least the same reasons discussed above for claims 1 and 10, on this record we have reservations as to whether Petitioner has shown a reasonable likelihood that Chung anticipates claims 2–9 and 11–14.

G. Ground 2 – Alleged Obviousness Over Chung and Baynham

For Ground 2, Petitioner asserts that claims 1–15 are unpatentable as obvious over Chung and Baynham. Pet. 63–67. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 48–60.

In brief, in Ground 2, Petitioner relies on Chung for nearly all claim limitations, including the claimed extension, but additionally argues that it “would have been obvious to add a further extension to Chung’s central ramp to engage the actuation member 40, as taught by Baynham (EX1007).” Pet. 63. In particular, Petitioner describes Baynham’s spinal fusion implant as including a threaded tube that engages a screw/actuation member. *See id.* at 63–64. Petitioner maps Baynham’s threaded tube to the claimed “extension.” *See id.* at 64.

Petitioner argues that a person of ordinary skill in the art “would have been motivated to modify the structure surrounding Chung’s screw hole (31) to further lengthen Chung’s extension longitudinally towards the driving ramp, as taught by Baynham’s tube 27.” *Id.* at 65. Petitioner asserts that this modification would have provided advantages such as “improving the strength of the connection” and “allow[ing] use of a shorter screw.” *Id.* at 66 (citing Ex. 1002 (Drewry Decl.) ¶¶ 251–52). Petitioner further asserts that a person of ordinary skill in the art would have had a reasonable expectation of success in combining Baynham’s tube with Chung, including because it is a “simple substitution of known mechanical features with each performing their known function.” *Id.* at 67 (citing Ex. 1002 (Drewry Decl.) ¶¶ 254–55).

Patent Owner responds that Petitioner’s proffered motivations to combine are based on hindsight. Prelim. Resp. 48. In brief, Patent Owner argues that “Chung has no use for an extension because the implant already has sufficient threaded engagment [sic] that (1) provides enough structural integrity and (2) allows for full expansion of the device without the screw protruding from the distal end of the lead wedge.” *Id.* at 50 (citing Ex. 2001 (Culbert Decl.) ¶ 88). Patent Owner also argues that Petitioner has not demonstrated a reasonable expectation of success in adding Baynham’s extension to Chung. *Id.* at 58–60.

After considering the arguments and evidence of record, we determine that Petitioner has shown a reasonable likelihood of establishing that claims 1–9 and 15 would have been obvious over Chung and Baynham.¹⁶

¹⁶ We address claims 10–14 in the last paragraph of this section.

Nevertheless, we recognize that the issues in dispute are highly fact-intensive and implicate genuine issues of fact more appropriately resolved on a fully developed record. At this early stage, we offer the following observations on Patent Owner's arguments.

Patent Owner contends that “[n]otably absent from Petitioner’s argument is any evidence that a POSITA would have recognized any deficiencies in the strength of Chung’s connection such that a threaded extension would be desired or needed.” Prelim. Resp. 52. To the extent Patent Owner maintains this argument post-institution, Patent Owner may want to address why such evidence is needed, given the Federal Circuit’s statement that “a challenger need not prove that there was a known problem with the prior art in order to demonstrate that there was a motivation to combine prior art references.” *Arctic Cat Inc. v. Polaris Indus., Inc.*, 795 F. App’x 827, 833 (Fed. Cir. 2019); *see also Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002–03 (Fed. Cir. 2016) (finding that patent challenger need not establish “a known problem with the prior art system in order to articulate the required rational underpinning for the proposed combination”).

Patent Owner also argues that a person of ordinary skill in the art would have understood “that it is important to have as much available space within the implant” as possible to hold “bone implant material” and “facilitate natural integration of the expandable implant.” Prelim. Resp. 56 (citing Ex. 2001 (Culbert Decl.) ¶¶ 104–05; Ex. 2003 ¶ 113; Ex. 1006 ¶ 75). Patent Owner argues that a person of ordinary skill in the art “would have been motivated to not sacrifice any of this space for an extension, particularly given that Chung already provides sufficient threading to allow

for full expansion and to maintain the necessary structural integrity.” *Id.* at 57 (citing Ex. 2001 (Culbert Decl.) ¶ 107).

To the extent Patent Owner pursues this argument during trial, the parties may want to more specifically address the volume of bone graft material needed to facilitate natural integration of the expandable implant, as compared to the space occupied by the proposed elongated extension. Additionally, Patent Owner may want to more specifically address how this argument is compatible with prior art that teaches embodiments that can include both bone graft material and elongated extensions. *See* Prelim. Reply 6–7 (citing, *e.g.*, Ex. 1006 ¶ 75; Pet. 77–78).

Regarding reasonable expectation of success, Patent Owner argues that “Petitioner fails to account for additional changes to Chung that would be required to include an extension,” and that “[a]dding the additional threaded extension without additional changes would result in an expandable implant that can easily over expand and fall apart.” Prelim. Resp. 59 (citing, *e.g.*, Ex. 2001 (Culbert Decl.) ¶¶ 115–19). During the trial phase we encourage the parties to keep in mind that “[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference,” *see Facebook, Inc. v. Windy City Innovations, LLC*, 973 F.3d 1321, 1343 (Fed. Cir. 2020) (citations omitted), and to consider tailoring their arguments accordingly.

Finally, we note that in Ground 2, Petitioner relies on Chung, not Baynham, to teach limitation 10[e] (the “complementary with one another” limitation). *See* Pet. 63. Thus, in our current view, in Ground 2, Petitioner’s arguments for independent 10 and its dependent claims 11–14 do not overcome the issues we discussed above for Ground 1 regarding limitation

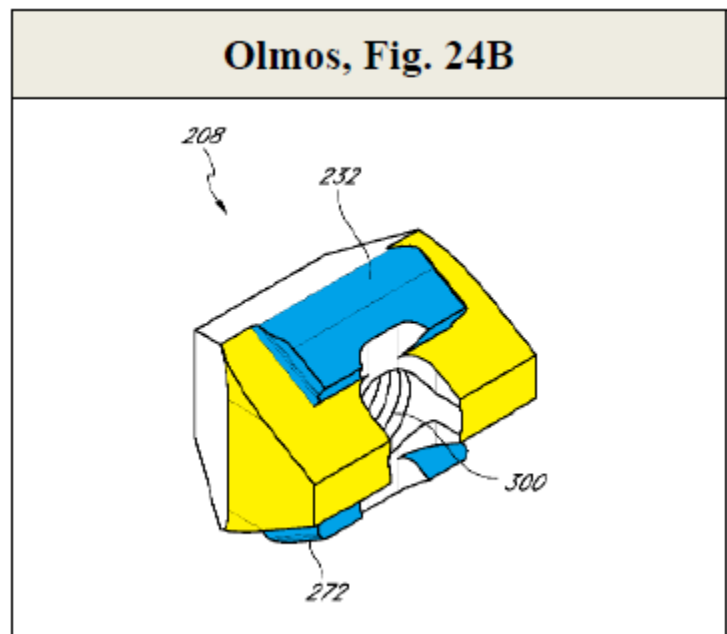
10[e]. *See supra* Section II.F.2. Accordingly, for at least those same reasons, on this record we have reservations as to whether Petitioner has shown a reasonable likelihood that claims 10–14 would have been obvious over Chung and Baynham.

H. Ground 3 – Alleged Obviousness Over Olmos, or Olmos and Chung

Petitioner asserts that claims 1–15 are unpatentable as obvious over Olmos alone or in combination with Chung. Pet. 67–122. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 32–76, 84–93.

Petitioner provides a limitation-by-limitation analysis as to how Olmos or Olmos and Chung allegedly disclose an intervertebral implant meeting each and every limitation of challenged claim 1.¹⁷ *See* Pet. 67–122. For the claimed “extension,” Petitioner relies on Olmos’s “guide member 232,” which is shown in blue in Petitioner’s annotated version of Olmos Figure 24B, reproduced below:

¹⁷ To provide context and clarity for the discussion below, we note that as to Olmos, Petitioner’s obviousness arguments generally rely on Olmos’s Figure 16–26 embodiment. *See generally* Pet. 67–77, 80–85. Petitioner also provides an alternative argument regarding modifying the Figure 16–26 embodiment with the extension taught in Olmos’s Figure 8 embodiment. *See id.* at 77–80, 117–20.



Pet. 76. In Petitioner’s annotated version of Olmos Figure 24B, reproduced above, Petitioner highlights “guide member 232” in blue and structure flanking the guide member in yellow. *See id.* Petitioner maps “guide member 232” (blue) to the claimed “extension,” and the flanking structure (yellow) to the claimed “expansion portion.” *See id.* at 75–76. Petitioner argues that the extension/guide member 232 “extends in a longitudinal axis from the expansion portion.” *Id.* at 76.

Petitioner alternatively contends that “it would have been obvious to add a further extension to the central ramp,” namely, Olmos’s outer sleeve member 34 as depicted in Olmos’s Fig. 8. *Id.* at 77; *see also id.* at 77–79 (discussing outer sleeve member 34). Petitioner argues that a person of ordinary skill in the art would have been motivated to make this modification including because it would allow use of a shorter actuator/screw and would make the connection between the wedges stronger. *Id.* at 117–20.

At this stage of the proceeding, Patent Owner disputes Petitioner’s contentions regarding (i) the limitation in the independent claims relating to an “extension” of the central ramp; (ii) whether Olmos’s Figure 16–26 embodiment teaches claim 1’s requirement that the “extension extend[] in a longitudinal axis from the expansion portion”; (iii) whether it would have been obvious to add an extension (or further extension) to Olmos’s Figure 16–26 embodiment; and (iv) whether Olmos teaches the “complementary with one another” limitation of claim 10. *See* Prelim. Resp. 32–48, 60–76, 84–85, 85–93.

After considering the arguments and evidence of record, we determine that Petitioner has shown a reasonable likelihood of establishing that claims 1–9 and 15, but not claims 10–14,¹⁸ would have been obvious over Olmos or Olmos and Chung. Nevertheless, we recognize that the issues in dispute are highly fact-intensive and implicate genuine issues of fact more appropriately resolved on a fully developed record. At this early stage, we offer the following observations on Patent Owner’s arguments.

1. Whether Olmos Teaches the Claimed “extension”

Patent Owner argues that “guide member 232” in Olmos’s Figure 16–26 embodiment is not an “extension” as claimed. *See, e.g.,* Prelim. Resp. 32–40. This argument is largely based on Patent Owner’s proposed construction of “extension” as meaning “a structure that increases the length of the central ramp.” *See supra* Section II.D.1. Patent Owner also contends that a person of ordinary skill in the art would have recognized Olmos’s “guide member 232” (colored blue in Petitioner’s annotated version of

¹⁸ We address claims 10–14 in Section II.H.4, below.

Olmos's Figure 24B reproduced above) as mapping to the claimed "expansion portion," not the claimed "extension," and argues that during prosecution, the Examiner never identified Olmos's guide member 232 as the claimed "extension." *See, e.g.,* Prelim. Resp. 35, 38.

On this record, we find Patent Owner's arguments unavailing. Under our preliminary construction of "extension" as meaning "an addition to a main structure," we find for purposes of institution that Olmos's guide member 232 is "an addition to a main structure." In particular, independent claims 1, 10, and 15 recite that the central ramp comprises an extension. Here, Petitioner has sufficiently shown for purposes of institution that Olmos's guide member 232 teaches the claimed "extension" because it is an addition to wedge member 208. This can be seen, for example, in Petitioner's annotated version of Olmos's Figure 24B, reproduced above, where guide member 232 protrudes above and below the top and bottom surfaces of wedge member 208.

Accordingly, for purposes of institution, we find that Petitioner has sufficiently shown that Olmos's guide member 232 teaches the claimed "extension."

2. Whether Olmos's Figure 16–26 Embodiment Teaches Claim 1's Requirement that the "extension extend[] in a longitudinal axis from the expansion portion"

Patent Owner argues that "neither Petitioner nor its expert even attempt to explain how the alleged extension [guide member] 232 (blue) 'extends in a longitudinal axis' from the expansion portion, as they tried to do with Chung." Prelim. Resp. 84. We agree with Patent Owner.

For purposes of institution, we have reservations as to whether Petitioner has sufficiently shown that Olmos's guide member 232 teaches

the claimed “extension extending in a longitudinal axis from the expansion portion.” Referring to Petitioner’s annotated version of Olmos’s Figure 24B, reproduced above, extension/guide member 232 (blue) and the expansion portion (yellow) appear to terminate in the same plane on the rear side of distal wedge 208, and the extension/guide member 232 (blue) appears to terminate before the expansion portion (yellow) on the front side of distal wedge 208. On this record, we determine that the Petition fails to adequately explain how the extension/guide member 232 “extend[s] in a longitudinal axis from the expansion portion.”

We note, however, that this issue does not affect Petitioner’s alternative argument that a person of ordinary skill in the art would have been motivated to add a further extension (namely, outer sleeve member 34) from Olmos’s Figure 8 embodiment to Olmos’s Figure 16–26 embodiment. *See* Pet. 77–80, 117–20. Petitioner contends that outer sleeve member 34 “extends longitudinally from an expansion portion of the driving ramp/proximal wedge and receives the actuator shaft 30.” *Id.* at 77. On this record, Petitioner’s contention appears to be reasonable, and Patent Owner does not presently dispute it.

3. Whether it Would Have Been Obvious to Add an Extension to Olmos’s Figure 16–26 Embodiment

With respect to Petitioner’s argument that a person of ordinary skill in the art would have been motivated to combine the extension in Olmos’s Figure 8 with Olmos’s Figure 16–26 Embodiment, Patent Owner argues that “[a]s with the combination of Chung and Baynham, Petitioner’s proposed motivations to combine here are fundamentally flawed because they are premised on hindsight bias and ignore the true reason Olmos relies on an

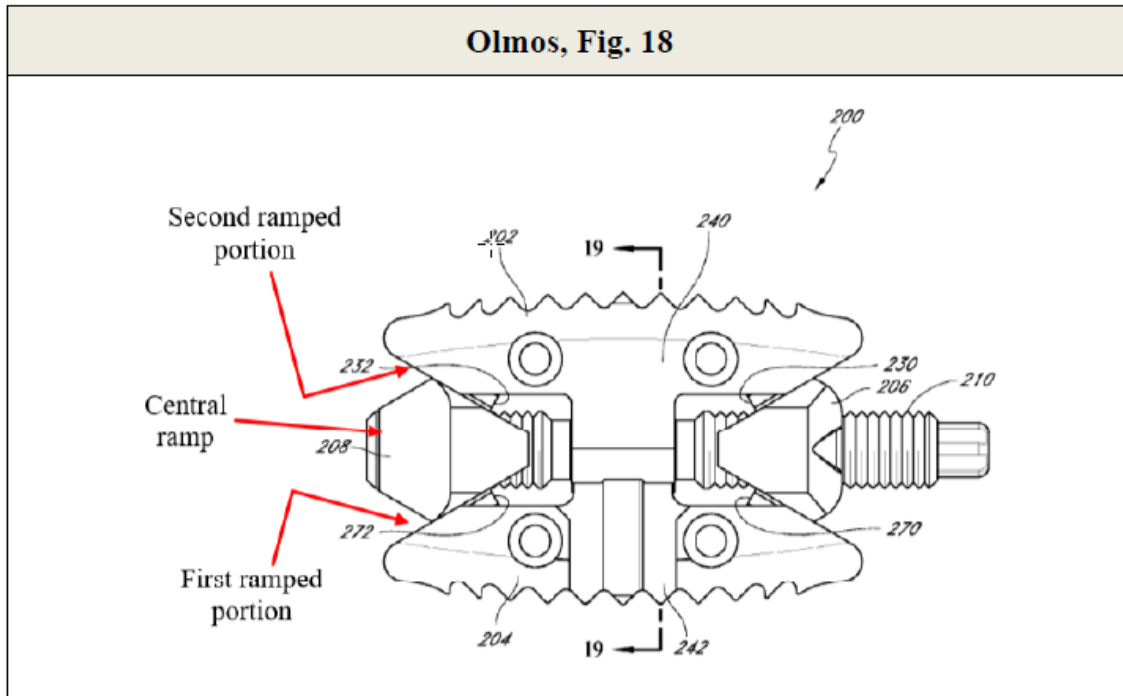
extension in Figure 8.” Prelim. Resp. 60. In brief, Patent Owner argues that Olmos’s “Figure 16–26 Embodiment has no use for extension 34 (or 32) and is already sufficiently robust and expands without the screw protruding from distal wedge 68, while providing sufficient structural integrity.” *Id.* at 62–63 (citing, *e.g.*, Ex. 2001 (Culbert Decl.) ¶ 127). Patent Owner also argues that “Petitioner fails to provide any evidence that a POSITA would recognize or identify any issue with the structural integrity of Olmos’s device.” *Id.* at 65. Patent Owner also argues that a person of ordinary skill in the art would have been motivated to “provide as much volume as possible for implant and would be discouraged from adding an additional structure within the cavity.” *Id.* at 70 (citing Ex. 2001 (Culbert Decl.) ¶¶ 150–51). Patent Owner also argues that “Petitioner’s proposed modification would render Olmos’s implant inoperable without additional unexplained and unidentified modifications.” *Id.* at 71.

Given the similarity of arguments between Ground 2 and Ground 3, we suggest that the parties consider the guidance we provided above for Ground 2 (*see supra* Section II.G) to be applicable to Ground 3 as well. To streamline the issues for trial, the parties should also consider clearly highlighting any material differences in the dispositive issues for Grounds 2 and 3.

4. Whether Olmos Teaches the “complementary with one another” Limitation of Claim 10

As discussed above, limitation 10[e] recites: “the first ramped portion of the first endplate and the second ramped portion of the second endplate are **complementary with one another**.” Pet. 132 (emphasis added); Ex. 1001, 22:24–26. Petitioner argues that Olmos teaches this limitation

because it has endplates with ramped portions that “have the same angle, effectively mirroring each other.” Pet. 102. This is illustrated in Petitioner’s annotated version of Olmos’s Figure 18, which we reproduce below:



Id. Petitioner’s annotated version of Olmos’s Figure 18, reproduced above, show Olmos’s intervertebral implant, with red arrows pointing to the central ramp/distal wedge member 208 and first and second endplates having first and second ramped portions. *See id.*; *see also* Ex. 1002 (Drewry Decl.) ¶¶ 380–82.

Patent Owner argues that these mirrored surfaces are the “*opposite of complementary*,” because “they cannot engage in a way that enhances their engagement.” Prelim. Resp. 86 (citing Ex. 2001 (Culbert Decl.)) ¶ 163).

On the current record, we agree with Patent Owner that the ramps Petitioner relies on in Olmos are not “complementary with one another” as claimed. As discussed above, we preliminarily construe this term to mean “completing one another.” *See supra* Section II.D.3. On this record, we

preliminary find that Olmos’s ramps, which are mirrored by having the same angles across the horizontal plane between them, do not complete each other. Additionally, for the same reasons discussed above (*see supra* Section II.F.2), we are not persuaded by Petitioner’s argument (*see* Pet. 103) that its mapping is correct given that during prosecution, the Examiner identified these same ramps in Olmos as being complementary with one another.

I. Ground 4 – Alleged Obviousness Over Chung and Olmos, or Chung, Olmos, and Baynham

Petitioner asserts that claims 2–6 and 10–14 are unpatentable as obvious over Chung and Olmos, or Chung, Olmos, and Baynham. Pet. 123–125. In brief, Petitioner presents this ground to argue that “[a] POSITA would have been motivated to modify the endplates of Chung to add Olmos’ extension design to their respective lower surfaces to connect the previously identified divided extensions” to meet specific limitations recited in claims 2–6 and 10–14. Patent Owner does not specifically address Ground 4 in any respect. *See generally* Prelim. Resp.

Given the fact-intensive nature of Petitioner’s arguments, and in the absence of any commentary on this ground from Patent Owner, we will evaluate this ground on the record that is developed during trial.

III. PETITIONER’S MOTION TO SEAL

Concurrent with the Petition, Petitioner filed a Motion to File Under Seal. Paper 3 (“Motion”).¹⁹ Petitioner requests that we seal portions of Exhibit 1002 (Drewry Decl.) and the entirety of Exhibit 1010 (a claim chart

¹⁹ The Motion lacks page numbers. We consider the title page as page 1 and assign each subsequent page a sequential number.

submitted as an exhibit to Patent Owner’s litigation infringement contentions). *Id.* at 2. Petitioner filed a redacted version of Exhibit 1002. *Id.* Petitioner represents that the material it seeks to seal contains its trade secrets. *Id.* at 3–4. Petitioner filed a proposed protective order, which includes modifications to the Board’s default protective order. *See* Ex. 1018; Ex. 1019.

Patent Owner filed a Response to Petitioner’s Motion. Paper 7. Patent Owner indicates that it does not oppose “the Board sealing Petitioner’s confidential information,” but does oppose Petitioner’s proposed protective order. *Id.* (citing Ex. 1018; Ex. 1019). However, Patent Owner represents that “the parties have conferred and agree to the terms of the stipulated protective order filed as Exhibit 2100.” *Id.*; *see also* Ex. 2101 (redline comparison of Ex. 2100 to the Board’s default protective order).

We find that Petitioner has established good cause to seal its trade secret information. Accordingly, we grant Petitioner’s Motion. 37 C.F.R. § 42.14. We also enter the stipulated protective order filed as Exhibit 2100.

We remind the parties that confidential information that is subject to a protective order ordinarily becomes public forty-five days after denial of a petition to institute trial or 45 days after final judgment in a trial. *See* Consolidated Office Trial Practice Guide, 21–22. There is an expectation that information will be made public where the existence of the information is referred to in a decision to grant or deny a request to institute a review. *Id.* at 22. A party seeking to maintain the confidentiality of information, however, may file a motion to expunge the information from the record prior to the information becoming public. *Id.*; 37 C.F.R. § 42.56.

IV. CONCLUSION

For the foregoing reasons, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that at least one of the challenged claims of the '731 patent is unpatentable.

At this preliminary stage, we have not made a final determination with respect to the patentability of any challenged claim or any underlying factual and legal issues. *See TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (noting that “there is a significant difference between a petitioner’s burden to establish a ‘reasonable likelihood of success’ at institution, and actually proving invalidity by a preponderance of the evidence at trial”). Any final decision in this proceeding will be based on the full trial record.

The Board will deem forfeited any issue not raised by Patent Owner in a timely response to the Petition, or as permitted in another manner during trial, even if asserted in the Preliminary Response or discussed in this Decision.

Nothing in this Decision authorizes Petitioner, in a manner not otherwise permitted by the Board’s rules, to supplement the information pertaining to any ground advanced in the Petition.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted based on all grounds asserted in the Petition;

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial commencing on the entry date of this Decision;

FURTHER ORDERED that Petitioner's Motion to File Under Seal is *granted*; AND

FURTHER ORDERED that the Stipulated Protective Order (Ex. 2100) is entered.

IPR2022-01434
Patent 8,845,731 B2

For PETITIONER:

Michael Houston
mhouston@foley.com

Scott Anderson
sanderson@foley.com

Jeffrey Costakos
jcostakos@foley.com

For PATENT OWNER:

Stephen Zinda
stephen@chzfirm.com

James Hall
james@chzfirm.com

J. Cabello
david@chzfirm.com