Trials@uspto.gov
571-272-7822

Paper No. 8
Date: August 23, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SPINAL ELEMENTS, INC.,
Petitioner,

v.

SPECTRUM SPINE IP HOLDINGS, LLC,
Patent Owner.

PGR2021-00050
Patent 10,709,575 B2

Before ULRIKE W. JENKS, JAMES A. TARTAL, and JAMES A. WORTH, *Administrative Patent Judges*.

JENKS, *Administrative Patent Judge*.

DECISION
Granting Institution of Post-Grant Review
35 U.S.C. § 324

I. INTRODUCTION

On February 9, 2021, Spinal Elements, Inc. ("Petitioner") filed a Petition requesting a post-grant review of claims 1–9 ("the challenged claims") of U.S. Patent No. 10,709,575 B2 (Ex. 1001, "the '575 patent"). Paper 1 ("Pet."). On May 25, 2021, Spectrum Spine IP Holdings, LLC ("Patent Owner") filed a Preliminary Response to the Petition. Paper 7 ("Prelim. Resp.").

Institution of a post-grant review is authorized by statute when "the information presented in the petition filed under [35 U.S.C. §] 321 . . . demonstrates that it is more likely than not that at least 1 of the claims challenged in the petition is unpatentable." 35 U.S.C. § 324(a) (2018). For the reasons set forth below, we determine that Petitioner has demonstrated that it is more likely than not that claims 1–9 are unpatentable, and we institute a post-grant review of claims 1–9 based on the grounds set forth in the Petition.

A. Related Matters

The parties assert that there are no pending judicial or administrative matters that may affect or be affected by a decision in this proceeding. Pet. 125; Paper 5, 1.

B. The '575 Patent (Ex. 1001)

The '575 patent is titled "Expandable Intervertebral Cage Assemblies." Ex. 1001, code (54). The '575 patent issued from Application No. 16/140,500 ("the '500 application"), filed Sept. 24, 2018. *Id.* at codes (21), (22). The '500 application is a continuation of application No. 15/666,103, filed on Aug. 1, 2017, now Pat. No. 10,111,758, which is a

continuation of application No. 14/878,929, filed on Oct. 8, 2015, now abandoned, which is a continuation-in-part of application No. 14/561,214, filed on Dec. 4, 2014, now Pat. No. 9,585,767, which is a continuation of application No. 13/962,879, filed on Aug. 8, 2013, now Pat. No. 9,585,766. *Id.* at code (63). The '500 application also claims priority to provisional application No. 61/787,744, filed on Mar. 15, 2013, and provisional application No. 61/680,729, filed on Aug. 8, 2012. *Id.* at (60).

The '575 patent relates to an expandable assembly for insertion into an intervertebral space. *See id.* at 1:66–67, 4:24–25. The Specification of the '707 patent describes the assembly as a cage assembly that includes an expander which, when inserted, selectively expands the body of the cage assembly to a desired size. *Id.* at 4:26–29. In one embodiment, cage assembly 1000 includes generally elongate cage body 1010 and expander 1032, as depicted in Figures 1A and 1B, reproduced below.

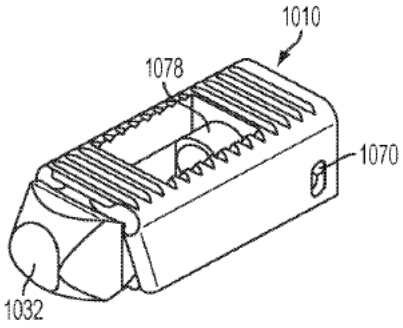


FIG. 1A

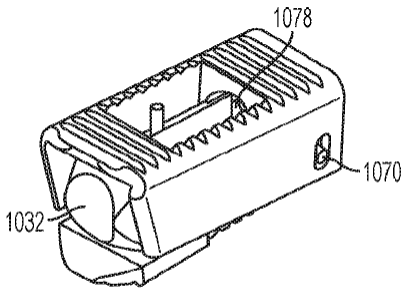


FIG. 1B

Figure 1A is a perspective view of an expandable cage for insertion into an intervertebral space in an unexpanded position, and Figure 1B depicts the expandable cage of Figure 1A in an expanded position. *Id.* at 2:17–21. Cage body 1010 is generally rectangular in cross-section and includes upper portion 1012 and lower portion 1018 (*see* Fig. 2B), the outer

surfaces of which are joined together by hinge 1070. *Id.* at 4:40–45. As seen from a top view, cage body 1010 also includes an opening or window, as depicted in Figures 5A and 5B, reproduced below.

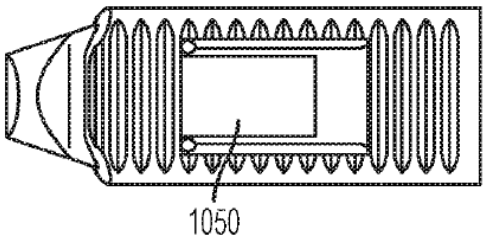


FIG. 5A

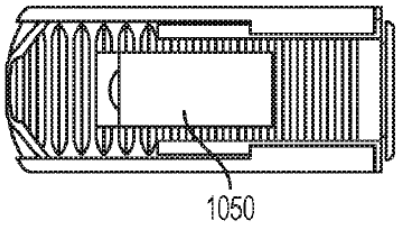


FIG. 5B

Figure 5A is a top plan view of the expandable cage of Figure 1A in the unexpanded position, and Figure 5B is a top plan view of the expandable cage of Figure 1A in the expanded position. *Id.* at 2:37–40.

The ’575 patent explains that window 1050 depicted in Figures 51A and 5B is for receiving bone fusion material. *Id.* at 4:50.

Cage assembly 1000 also includes elongate expander 1032 that when pulled proximally and into a cavity of cage body 1010, will cause upper and lower portions 1012, 1018 of the cage body 1010 to expand or spread open vertically relative to one another, while also allowing upper and lower portions 1012, 1018 to rotate about hinge 1070 thereby changing the angle of upper portion 1012 with respect to lower portion 1018. *Id.* at 5:23–31. An exemplary expander 1032 is depicted in Figure 7, reproduced below.

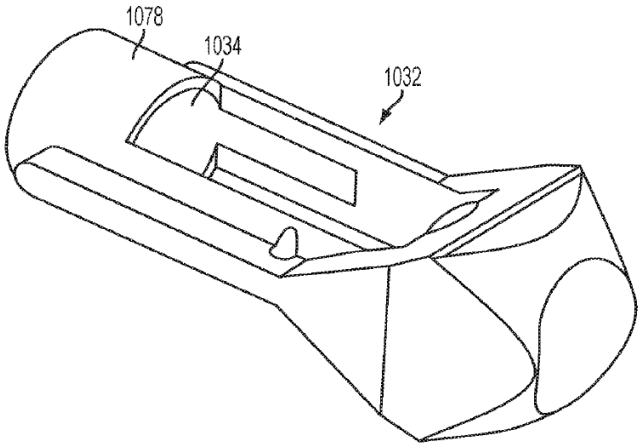


FIG. 7

Figure 7 is a perspective view of an expander for use in an expandable cage. *Id.* at 2:45–46.

Expander 1032 includes a proximal end having proximal portion 1078, which is visible through window 1050 in the unexpanded position of Figure 1A. *Id.* at 4:66–5:2. Expander 1032 also includes opening 1034. *Id.* at Fig. 7.

C. Illustrative Claim

Claims 1 and 8 are the independent claims challenged by Petitioner in this proceeding. Independent claim 1, reproduced below, is illustrative of the subject matter:

> 1. [a] An expandable cage for insertion into an intervertebral space, the expandable cage comprising:
>
> [b] a cage having an upper portion and a lower portion, the upper portion having an upper bone contact surface and an upper portion lower surface, the lower portion having a lower bone contact surface and a lower portion upper surface,

> [c] wherein the upper portion and the lower portion each define a window configured to permit bone growth therethrough;
>
> [d] an elongate expander positioned in a cavity or an internal space therebetween the upper portion lower surface and the lower portion upper surface, the elongate expander having a distal or leading end, a proximal or trailing end and a pair of side surfaces connecting the distal end and the proximal end having an unobstructed internal space or opening therebetween defining a window therethrough,
>
> [e] wherein longitudinal translation of the elongate expander causes the expander to act upon portions of the upper portion and the lower portion to expand the cage body by separating at least a portion of the upper portion from at least a portion of the lower portion,
>
> [f] wherein, in an expanded position, the windows in each of the upper portion, lower portion, and elongate expander are open and unobstructed with respect to one another when viewed from a top view.

Ex. 1001, 8:10–34 (formatting, bracketing, and lettering added for reference convenience). Claim 8, the only other independent claim, is also directed to an expandable cage, and includes similar limitations to those of claim 1 and additionally includes an aperture in the elongate expander to permit introduction of bone growth material into the expandable cage, and a cap or set screw inserted into the aperture to contain the bone growth material. *Id.* at 8:57–9:27.

D. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–9 of the ’575 patent are unpatentable based on the following eight grounds. Pet. 16–17.

Ground	Claim(s) Challenged	35 U.S.C. §	References/Basis
1	1–7	102(a)	Greenhalgh[1]
2	8, 9	103	Greenhalgh
3	8, 9	103	Greenhalgh, Lynn[2]
4	8, 9	103	Greenhalgh, Weiman[3]
5	1–9	102(a)	Weiman
6	1–9	103	Weiman
7	1, 4–6, 8, 9	102(a)	Glerum[4]
8	8, 9	103	Glerum

Petitioner also relies upon the declaration of Brad Culbert (Ex. 1003) to support its contentions.

II. ANALYSIS

A. Post Grant Review Eligibility

As a threshold issue, we must determine whether the ’575 patent is eligible for post-grant review. There are two requirements that must be met for post-grant review to be available. First, post-grant review is only available if the petition is filed within nine months of the issuance of the challenged patent. 35 U.S.C. § 321(c) (2018). Here, the Petition was filed on February 9, 2021, which is within nine months of the ’575 patent’s July 14, 2020 issue date. Exhibit 1001, code (45).

[1] US 8,382,842 B2 issued February 26, 2013. Ex. 1004.
[2] US 8,343,224 B2 issued January 1, 2013. Ex. 1007.
[3] US 8,852,279 B2 issued October 7, 2014. Ex. 1005.
[4] US 8,062,375 B2 issued November 22, 2011. Ex. 1006.

Second, as noted above, post-grant review is available only for patents that issue from applications that at one point contained at least one claim with an effective filing date of March 16, 2013 or later. *See* AIA §§ 3(n)(1), 6(f)(2)(A). The "effective filing date" for a claim is either the application's actual filing date or the filing date of the earliest application that supports the claim. 35 U.S.C. § 100(i) (2018).

Petitioner has the burden of establishing eligibility for post-grant review. *See Mylan Pharms. Inc. v. Yeda Res. & Dev. Co.*, PGR2016-00010, Paper 9 at 10 (PTAB Aug. 15, 2016). The '500 application is a transitional application because it was filed after March 16, 2013 (the AIA effective date) but claimed the benefit of an application filed before March 16, 2013. *U.S. Endodontics, LLC v. Gold Standard Instruments, LLC,* PGR2015-00019, Paper 54, at 7–8 (PTAB Dec. 28, 2016). To show that the '575 patent is eligible for post-grant review, Petitioner bears the burden of proving that the challenged claims lack the benefit of the filing date of the earliest application that supports the claims. In particular, Petitioner must show that at least one of the challenged claims "was not disclosed in compliance with the written description and enablement requirements of § 112(a) in the earlier application for which the benefit of an earlier filing date prior to March 16, 2013 was sought." *Inguran, LLC v. Premium Genetics (UK) Ltd.*, PGR2015-00017, Paper 8 at 11 (PTAB Dec. 22, 2015).

Petitioner argues that the '575 patent is eligible for post-grant review because none of the challenged claims are entitled to an effective filing date earlier than September 24, 2018, which is the actual filing date of the '500 application. Pet. 12–15; Ex. 1001, code (22). Petitioner's contention is based on its argument that "the parent application (Ex. 1012) to the '575

patent does not provide adequate support or enablement for the [original] claim [2]" of the '500 application. Pet. 14. Therefore, the claims of the '575 patent lack written description in the priority applications, and, thus, are not disclosed in the manner provided by 35 U.S.C. § 112(a) by any pre-AIA application. *Id.* Consequently the effective filing date of the '575 patent is September 24, 2018. *Id.*; *see* Ex. 1001, code (22).

Patent Owner argues that during prosecution the Examiner erred in rejecting original claim 2 of the '500 application because the subject matter was disclosed in "U.S. Provisional Patent Application No. 61/680,729 ('the Provisional Patent Application' [('the '729 Provisional Application')]) filed on August 8, 2012, to which the '575 Patent claims priority, fully and clearly supports the subject matter described in original claim 2." Prelim. Resp. 67 (citing Ex. 2012; *see also* Ex. 2001 ¶¶ 254–261 (Serhan declaration)). Annotated Figures 5A and 5B of the '575 patent as provided in Patent Owner's Preliminary Response are reproduced below:

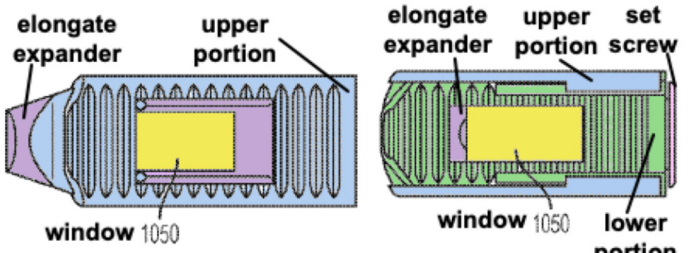


FIG. 5A FIG. 5B

Id. at 69. For ease of comparison annotated figures 14A and 14B of the '729 provisional as provided in Patent Owner's Preliminary Response are reproduced below:

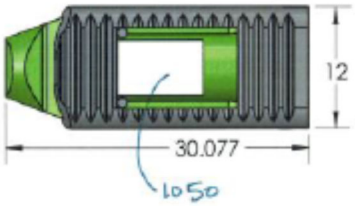
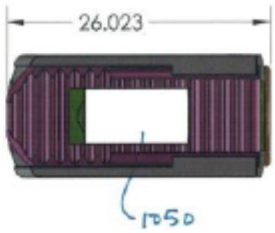


Fig. 14A
Fig. 14B



Id. at 68; Ex. 2001, ¶ 256.

Patent Owner argues that the Examiner erred in objecting to the priority of original claim 2 because when figures 5A and 5B of the '575 patent are compared to Figures 14A and 14B provided in the '729 provisional application, a person of ordinary skill in the art would clearly understand that the '575 patent depicts a window that is completely unobstructed and that supports the recitation of "at least 50% of the windows in each of the upper portion, lower portion, and elongate expander are unobstructed with respect to one another when viewed from the top view." Prelim. Resp. 69.

To claim the benefit of a priority application filed before March 16, 2013, and thereby avoid PGR-eligibility, the patent claims challenged must have written description support in, and be enabled by, the earlier-filed application. *See, e.g.*, *Inguran*, Paper 8 at 10–11; *Arkema Inc. v. Honeywell*

Int'l Inc., PGR2016-00011, Paper 54 at 21–22 (PTAB Aug. 31, 2017). That the '575 patent claims priority to a pre-AIA filing date does not relieve us of our obligation to determine whether the '575 patent is eligible for post-grant review by confirming that the claims have sufficient written descriptive support and are enabled in the priority application.

We, therefore, turn to the merits of Petitioner's arguments as to why the challenged claims are not entitled to the benefit of the earlier priority application.

1. *Written Description*

The issue is whether there is sufficient written descriptive support for the limitation of claim 2 in the as filed '500 application reciting "wherein at least 50% of the windows in each of the upper portion, lower portion, and elongate expander are unobstructed with respect to one another when viewed from the top view." Ex. 1002, 143. During prosecution of the '500 application, the Examiner found that the limitation of "'[a]t least 50%' provides a specific lower endpoint of a range from 50%-100%. The specification does not disclose such; nor do the figures illustrate such a specific value." *Id.* at 72; *see* Pet. 12-13.

Patent Owner argues that figures 5A and 5B of the '575 patent are nearly identical to Figures 14A and 14B provided in the '729 provisional application. We agree with Patent Owner that these figures are similar. However, based on the figures alone, without more, a person of ordinary skill in the art cannot determine the lower end point of the range as recognized by the Examiner during prosecution. Figures are routinely relied upon for relative information regarding the placement of components, however, figures cannot be relied upon for specific values. *See, e.g.*, *In re*

Skvorecz, 580 F.3d 1262, 1270 (Fed. Cir. 2009) ("A person skilled in the mechanical arts would understand the specification including the drawings as showing the offsets and the lateral displacement of each wire leg."); *Hockerson-Halbertstadt, Inc. v. Avia Group Int'l Inc.,* 222 F.3d 951, 956 (Fed. Cir. 2000) (holding that the drawings could not be relied upon to construe whether the term "central longitudinal groove" required that the width of the groove be less than the combined width of the fins). It is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue. *See In re Wright*, 569 F.2d 1124, 1127 (CCPA 1977) ("Absent any written description in the specification of quantitative values, arguments based on measurement of a drawing are of little value."); *In re Olson*, 212 F.2d 590, 592 (CCPA 1954).

Here, Patent Owner relies on the expert declaration of Dr. Serhan to support their position that the '729 provisional application provides written descriptive support for claim 2 of the '500 application as filed. *See* Prelim. Resp. 66–69 (citing Ex. 2001 ¶¶ 254–261; Ex. 2012). A review of Dr. Serhan's declaration shows that in addition to the figures the declarant relied on paragraphs 138–147 of the '729 provisional application to arrive at the conclusion that there is support for the limitation of "at least 50%." *See* Ex. 2001 ¶¶ 257–260 (citing Ex. 2012 ¶¶ 138–147). Paragraphs 138–147 of the '729 provisional application disclosed that the windows function as openings and that the windows and aperture of the expander are configured in such a way that they can accept bone fusion materials. *See* Ex. 2012 ¶ 146. We have reviewed the cited paragraphs but do not find that the disclosure in paragraphs 138–147 of the'729 provisional application (Ex.

2012) provides a sufficient disclosure to support Dr. Serhan's conclusion that the '729 provisional application describes the lower endpoint of the "at least 50%" as recited in claim 2 of the '500 application. Nothing in the Federal Rules of Evidence or Federal Circuit jurisprudence requires a fact finder to credit the unsupported conclusions or assertions of an expert witness. *Rohm and Haas Co. v. Brotech Corp.*, 127 F.3d 1089, 1092 (Fed. Cir. 1997) ("While an expert may testify to the ultimate issue in a case without giving the basis for that opinion . . . nothing in the rules requires a fact finder to accept this conclusion.").

After considering the Petition and the Preliminary Response, as well as the supporting evidence, we determine that Petitioner sufficiently demonstrates that it is more likely than not that at least one challenged claim in the as filed '500 application lacks written description support in the Specification.

2. *Conclusion: PGR Eligibility*

For the foregoing reasons we are persuaded that Petitioner has satisfied its burden to show that the Specification (and the '500 application) fails to provide written description support for at least claim 2 as filed in the '500 application. We, therefore, determine that the '575 patent is not entitled to the benefit of the filing date the '729 provisional application (August 8, 2012), and, thus, the '575 patent is eligible for post-grant review.

B. Discretionary Denial Under 35 U.S.C. § 325(d)

Patent Owner urges the Board to exercise discretion to deny institution of post-grant review under 35 U.S.C. § 325(d) because the

Petition raises "the same or substantially the same prior art or arguments" that were "previously presented to the Office." Prelim. Resp. 105–106.

Pursuant to 35 U.S.C. § 325(d), in determining whether to institute a post-grant review, "the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office." The Board evaluates two issues in addressing 35 U.S.C. § 325(d):

(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 at 8 (PTAB Feb. 13, 2020) (precedential) ("*Advanced Bionics*"). With respect to the first issue, previously "presented" art includes, among other things, "art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS), in the prosecution history of the challenged patent." *Id.* at 7–8. With respect to the second issue, institution generally will be denied if a "petitioner fails to make a showing of material error," and "[i]f reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability." *Id.* at 8–9. "[T]his framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown." *Id.* at 9.

The issue is whether the same art or arguments were previously presented to the Office. Patent Owner argues that we should exercise our discretion under 35 U.S.C. § 325(d) and deny institution because the same art or arguments were previously presented to the Office. Prelim. Resp. 105–106. Petitioner asserts eight grounds of unpatentability against the '575 patent. Pet. 30–124. Grounds 1–4 rely primarily on Greenhalgh, Grounds 5 and 6 rely primarily on Weiman, and Grounds 7 and 8 rely primarily on Glerum.

Patent Owner argues that Glerum was already considered by the Office. Prelim. Resp. 108. In particular, Patent Owner asserts that Glerum was previously before the Office because it was cited by the Examiner during the prosecution of Application No. 13/962,879 and Application No. 14/561,214, which are grandparents to the '575 patent and the same Examiner handled all of the applications. *Id.* at 109. Petitioner contends that the Examiner did not apply Glerum with respect to the patentability of the claims of the '575 patent. Pet. 17 ("Glerum was not cited during prosecution of the '575 patent. (Ex. 1001, pages 1-2)"). Petitioner, however, acknowledges that Glerum was cited during the prosecution of the grandparent applications to the '575 patent. Pet. 17; *see* MPEP 609.02 ("The examiner of the continuing application will consider information which has been considered by the Office in the parent application."). We thus determine under the first part of the *Advanced Bionics* framework that Glerum was previously presented to the Office.

Accordingly, we proceed to the second part of the *Advanced Bionics* framework and consider whether Petitioner has demonstrated that the Office erred in a manner material to the patentability of the challenged claims. *See*

Advanced Bionics, Paper 6 at 10 ("[I]f the record of the Office's previous consideration of the art is not well developed or silent, then a petitioner may show the Office erred by overlooking something"). Petitioner explains how Glerum meets each limitation of the '575 patent. Pet. 105–115. Petitioner contends that the Examiner did not apply Glerum to reject claims during the prosecution leading to the '575 patent. Pet. 17. Because Glerum appears to teach each limitation of the '575 patent, we find that Petitioner demonstrates that the Examiner erred by overlooking the specific teachings in the relevant prior art such that the error by the Office was material to the patentability of the challenged claims. See Advanced Bionics, Paper 6, 21. Thus, with respect to Grounds 7 and 8, we determine, on this record, that the same prior art was previously presented to the Office, but because Glerum was overlooked during the prosecution leading to the '575 patent we determine that the totality of the evidence favors declining to exercise our discretion under 35 U.S.C. § 325(d) to deny institution.

As to Grounds 5 and 6 relying on Weiman, Patent Owner asserts that the "Weiman Parent [U.S. Patent No. 8,398,713 B2] was relied on to reject claims during the prosecution of the parent of the '575 Patent." Prelim. Resp. 110. In particular, Patent Owner asserts that US Application No. 12/875,749, which published as US 2012/0059473 A1 is the "Weiman Parent." *Id.*; *see also* Ex. 2003. The Weiman reference (Ex.1005) upon which Petitioner relies, however, claims priority to US Application No. 12/875,637, which published as US 2012/0059470 A1. Nonetheless, even if there were a relationship between the "Weiman Parent" and Weiman, the record does not demonstrate that Weiman was previously considered by the Office with respect to the patentability of the claims of the '575 patent.

Thus, with respect to Grounds 5 and 6, we determine, on this record, that the same prior art or argument was not previously presented to the Office.

As to Grounds 1–4 relying on Greenhalgh, Patent Owner admits that Greenhalgh was not before the Office, but asserts that Greenhalgh is cumulative to Weiman and Glerum. Prelim. Resp. 114. In particular, Patent Owner asserts that Greenhalgh is cumulative to Weiman because Petitioner admits that the Weiman actuator is preferable to that of Greenhalgh. *Id.* A comparison of a single limitation, however, does establish that Greenhalgh is cumulative. As to whether Greenhalgh is cumulative to Glerum, Patent Owner points to Figure 3b of Greenhalgh, whereas the Petition relies on Figure 4b. *Compare* Prelim. Resp. 114 *with* Pet. 43. Because Patent Owner does not demonstrate that Greenhalgh's Figure 4b depicts a window having a similar "degree of obstruction" to that of Glerum, we are not sufficiently apprised that Greenhalgh is cumulative to Glerum.

For at least these reasons, we find that, under the first part of the *Advanced Bionics* framework, the Petition with respect to Grounds 1–6 asserts prior art against all of the challenged claims that is not the same or substantially the same art previously presented to the Office. *See Advanced Bionics*, Paper 6 at 8. We determine that on balance the totality of the evidence before us favors declining to exercise our discretion under 35 U.S.C. § 325(d) to deny institution. *See id.* at 8–9 (second part of framework reached only if first part is satisfied).

C. Level of Ordinary Skill in the Art

The parties generally agree that a person of ordinary skill in the art would have been a mechanical or biomedical engineer with several years of

experience or an orthopedic surgeon or neurosurgeon with experience designing or developing medical devices. Pet. 18–19; Prelim. Resp. 33. On this record, we adopt the parties' definition of the level of skill in the art. We further note that the prior art itself demonstrates the level of skill in the art at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings regarding ordinary skill level are not required "where the prior art itself reflects an appropriate level and a need for testimony is not shown") (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)).

D. Claim Construction

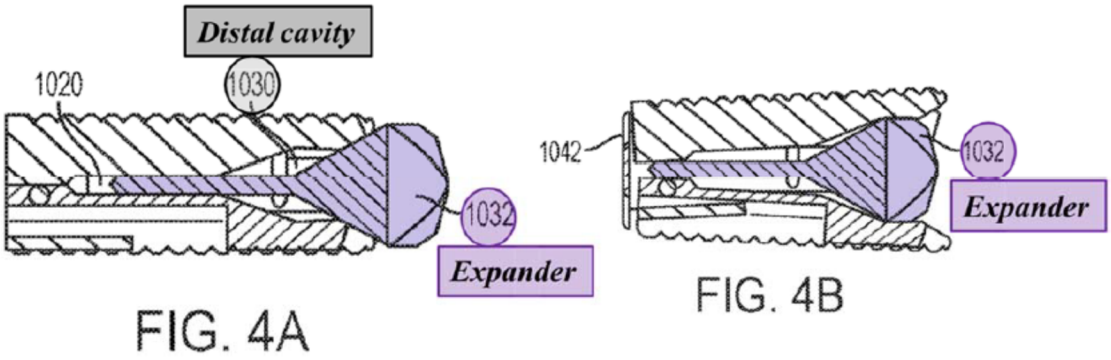
Petitioner proposes construction for several claim terms: "proximal," "distal," "open and unobstructed,[5]" "keyed distal end," and "configured to permit." Pet. 19–30. Patent Owner agrees with each of Petitioner's proposed constructions except for "keyed distal end," and additionally proposes a construction for "expander expands the cage." Prelim. Resp. 33–40. For purposes of this decision on institution we provide a construction of the terms "keyed distal end" and "expander expands the cage." *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (courts only construe claims to the extent necessary to resolve the dispute).

[5] Petitioner explains that "the plain meaning of an 'open' window is well understood to be a state allowing passage through the window.' Pet. 21 (citing Ex. 1003 ¶ 63). According to Petitioner, Patent Owner expressly defined "unobstructed" during prosecution to "mean there are no features lying in the path and blocking the window." *Id.* at 21–22. An example of an obstructing feature identified during prosecution is an axle (or jack screw) that extends down the center of the opening which acts like a bar. *Id.* at 22 (citing Ex. 1002, 29–30).

1. *Keyed Distal End*

Petitioner argues that "keyed distal end" should be interpreted to mean "the distal end is sized and shaped to match the corresponding surfaces on the upper and lower portions." Pet. 25 (citing Ex. 1003 ¶ 77). Patent Owner argues that "keyed distal end" should be interpreted to mean "the distal end is sized and shaped to fit at least partially within a distal cavity and is sized and shaped to engage corresponding surfaces on the upper and lower portions." Prelim. Resp. 35.

Annotated Figures 4A and 4B are reproduced below:



Pet. 26; Prelim. Resp. 35. Figures 4A and 4B, above show expander 1032 contacting the corresponding surfaces on the upper and lower portion. Pet. 26. The Specification describes that "the key is generally conical in cross-section with a rectangular or square end, like the head of a bolt, and tapered on both sides. The key shape on the distal portion may be sized and shaped to fit within a distal cavity 1030." Ex. 1001, 4:54–58. In addition, the Specification describes that the keyed shim "may also include side rails that are sized and shaped to engage with interior portions of the cage body 1010." *Id.* at 5:9–12.

On this record, at this stage of the proceeding we determine that "keyed distal end" is reasonably construed in light of the Specification to

mean that "the distal end is sized and shaped to fit at least partially within a distal cavity and is sized and shaped to engage corresponding surfaces on the upper and lower portions."

2. *Expander Expands the Cage*

Petitioner does not provide a construction for the limitation "expander expands the cage," but according to Patent Owner, Petitioner implies that the limitation encompasses movement of just the upper or lower portion of the cage. Prelim. Resp. 39; Pet. 41 ("Even in embodiments where the base 6 does not have ramps, the middle 8 still will 'act upon' the base to expand the cage body, as claimed." (Ex. 1003 ¶ 96.)). Patent Owner argues that such a construction is not consistent with the disclosure in the Specification. Specifically, Patent Owner argues that when the elongate expander is moved horizontally between the upper portion and lower portion of the cage, then "[s]eparation of the upper portion and the lower portion is the result of the expander acting upon the upper and lower portions. Separation of the upper and lower portions provides for expansion of the expandable cage." Prelim. Resp. 38. Therefore, Patent Owner urges that the phrase "expander expands the cage" should be construed "to mean that horizontally moving the elongate expander causes the expander to move both portions of the upper portion and the lower portion to expand the cage body by spreading apart at least a portion of the upper portion from at least a portion of the lower portion." *Id.* at 40.

The Specification describes that "the cage assembly may comprise an expander such as an expansion screw or a shim which, when inserted, selectively expands the body of the cage assembly to a desired size." Ex. 1001, 4:26–29. The Specification further describes that "translation of

the elongate expander proximally toward the trailing end expands the cage body by separating the at least a portion of the upper portion from at least a portion of the lower portion." *Id.* at 6:56–59.

On this record, at this stage of the proceeding we determine that "expander expands the cage" is reasonably construed to mean that the when the expander is moved to expand the cage the expander makes contact with both upper and lower portion of the cage and moves the two portions further apart. How much movement is required relative to what feature to meet the limitation of "expander expanding the cage" are issues the parties are free to further brief this issue at trial.

E. Anticipation of Claims 1–7 based on Greenhalgh (Ex. 1004)

Petitioner argues that claims 1–7 are unpatentable as anticipated by Greenhalgh. Pet. 30–56. Patent Owner opposes. Prelim. Resp. 41–56.

1. *Overview of Greenhalgh*

Greenhalgh is titled "Expandable Support Device and Method of Use" and relates to "devices for providing support for biological tissue, for example to fuse vertebral bodies, repair herniated discs, and/or repair spinal compression fractures, and methods of using the same." Ex. 1004, code (54); 1:14–17. In particular, the expandable device can be filled with a biocompatible material such as bone growth factors, to provide support, fixation and improved bone structure. *Id.* at 3:18–26. An exemplary expandable device is depicted in Figure 1a of Greenhalgh, reproduced below.

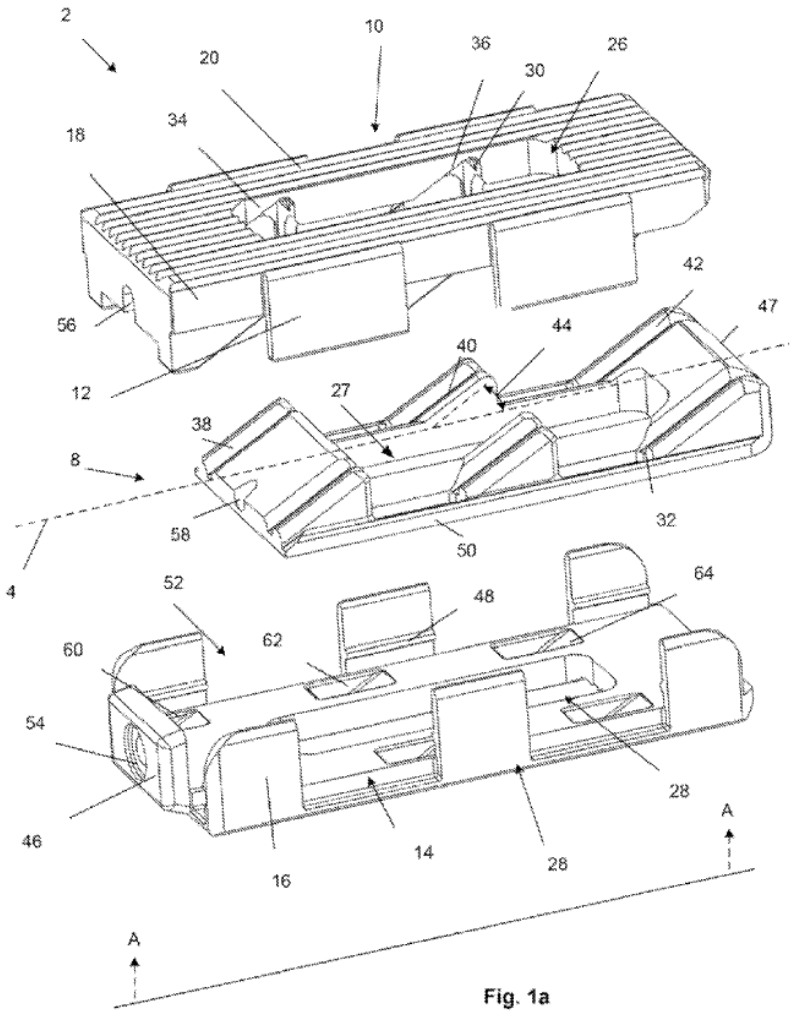


Fig. 1a

Figure 1a is an exploded view of an expandable device. Ex. 1004, 3:52–53. Expandable device 2 includes base or bottom 6, middle 8, and top 10. *Id.* at 4:56–58. Greenhalgh explains that height expansion that moves top 10 away from base 6 occurs when middle 8 is slid with respect to base 6 toward the first side. *Id.* at 7:17–21; Figs. 5a–5c. Top 10 includes port 26, middle 8 includes port 27 and base 6 includes port 28. *Id.* at 5:39–41. Top port 26, middle port 27 and base port 28 substantially align transverse with longitudinal axis 4, as seen in Figures 4a and 4b, reproduced below.

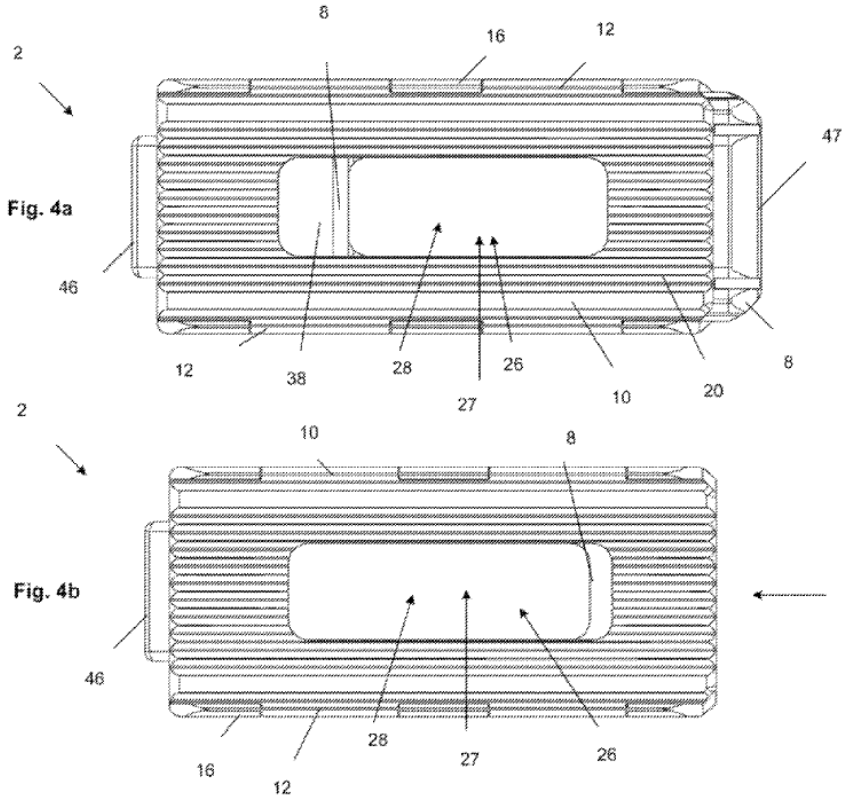


Figure 4a is a top view of a device in a height-contracted configuration, and Figure 4b is a top view of the device in a height-expanded configuration. *Id.* at 3:61–64. "The top/middle/base ports form a concurrent vertical port through the device 2." *Id.* at 7:1–2. This concurrent vertical port can be filled with a bone growth material. *Id.* at 7:2–4. Figure 4a depicts the concurrent vertical port partially obstructed by middle 8, including middle first ramp 38, when device 2 is in a height-contracted configuration, and Figure 4b depicts the concurrent vertical port less obstructed, or substantially unobstructed when device 2 is in a height-expanded configuration. *Id.* at 7:4–9.

2. *Analysis of Independent Claim 1*

a) Preamble (Element 1a)

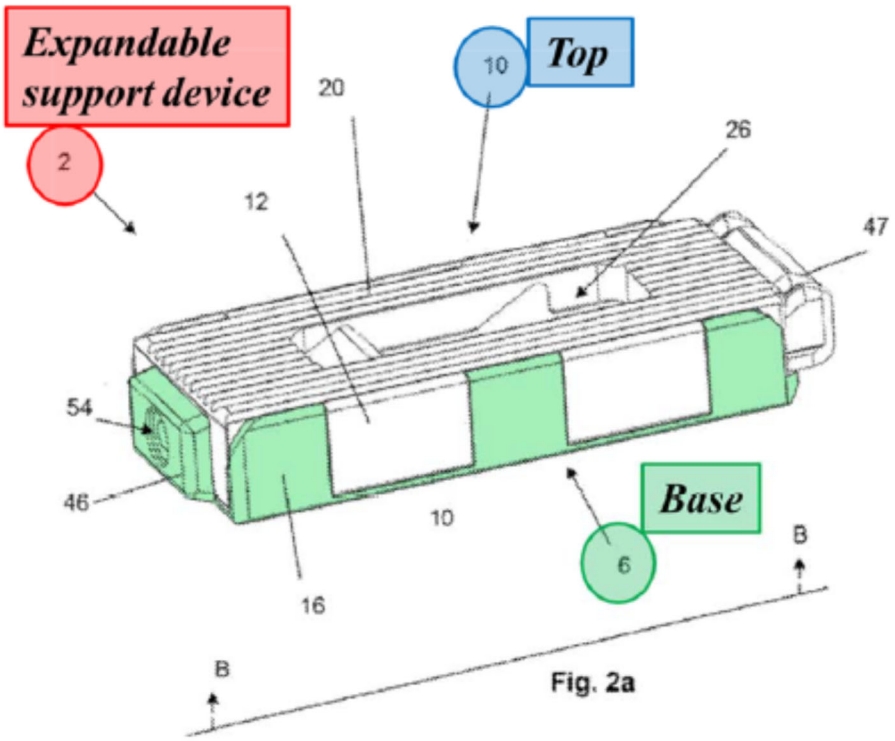
Petitioner argues that Greenhalgh discloses an expandable cage for insertion between vertebra. Pet. 31. Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 41–56.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Greenhalgh discloses an expandable cage. Greenhalgh discloses an expandable support device that "can be used to repair hard or soft tissue, such as bone or vertebral discs." Ex. 1004, Abstract. The expandable support device is an expandable cage. Pet. 31 (citing Ex. 1004, 2:47–49, 4:46–55, Figs. 2a, 8–10; Ex. 1003 ¶ 84 ("Persons of ordinary skill in the art commonly referred to implants packed with bone growth material . . . as cages.")).

b) Cage (Element 1b)

Petitioner argues that Greenhalgh discloses "a cage having an upper portion and a lower portion, the upper portion having an upper bone contact surface and an upper portion lower surface, the lower portion having a lower bone contact surface and a lower portion upper surface." Pet. 35. Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention that Greenhalgh discloses a cage. *See* Prelim. Resp. 41–56.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing. In particular, Greenhalgh's expandable support device has a base and a top. Figure 2a of Greenhalgh as annotated by Petitioner reproduced below:



"Greenhalgh's expandable support device 2 [red] has a base 6 [green] and a top 10 [blue]." Pet. 32 (citing Ex. 1004, 4:56–58 ("The expandable support device 2 can have a base or bottom 6 (base and bottom are used interchangeably), a middle 8, and a top 10.")).

c) Window (Element 1c)

Petitioner argues that Greenhalgh discloses that top 10 includes port 26 and the base includes port 28 (not shown in Figure 2a above), and that these ports are windows.[6] Pet. 34 (citing Ex. 1004, 5:39–43; Ex. 1003 ¶ 87). Patent Owner does not present arguments in the Preliminary Response

[6] The '575 patent does not define windows, but describes that "[t]he cage assembly may include one or more openings or windows for receiving bone fusion material." Ex. 1001, 4:29–31. The openings or windows are not disclosed as having a particular shape or particular size.

addressing the specific merits of Petitioner's contention that Greenhalgh discloses windows. *See* Prelim. Resp. 41–56.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing. In particular, Greenhalgh's expandable support device includes ports that can be filled with bone morphogenic substances that has contact with the surrounding tissue.

> [T]op port 26, middle port 27 and base port 28 substantially align transverse with the longitudinal axis 4. The top/middle/base ports form a concurrent vertical port through the device 2. The concurrent vertical port can be filled with any material disclosed herein or left empty. The concurrent vertical port can be partially obstructed by the middle 8, including the middle first ramp 38, when the device 2 is in a height-contracted configuration . . . . The concurrent vertical port can be less obstructed, or substantially unobstructed when the device 2 is in a height-expanded configuration.

Ex. 1004, 6:66–7:9 (citing Figs. 4a and 4B).

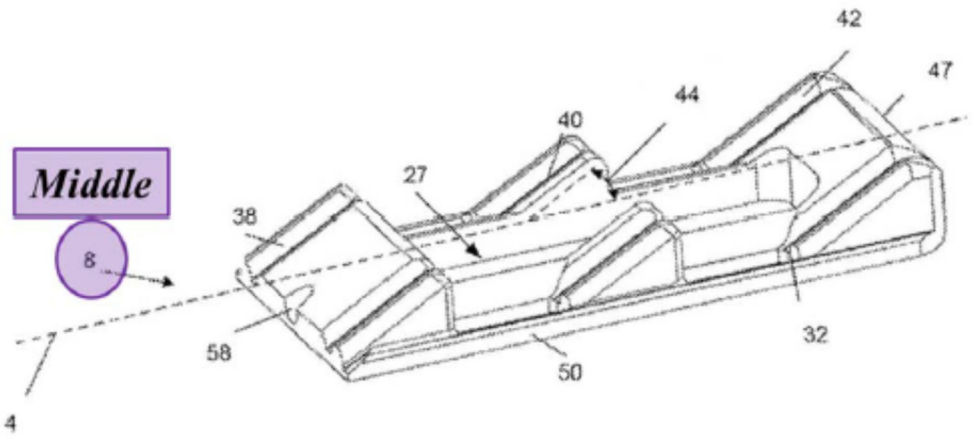
> When the expandable support device 2 is in a deployed configuration in vivo, the expandable support device 2 can be partially or substantially filled with a liquid, gel, or solid (e.g., in small parts or granules) filler material, or combinations thereof, such as bone morphogenic powder or any other material disclosed herein or combinations thereof. The filler material can contact or be in near contact with the surrounding tissue near the edge of the ports.

Id. at 9:30–37.

d) Elongate Expander (Element 1d)

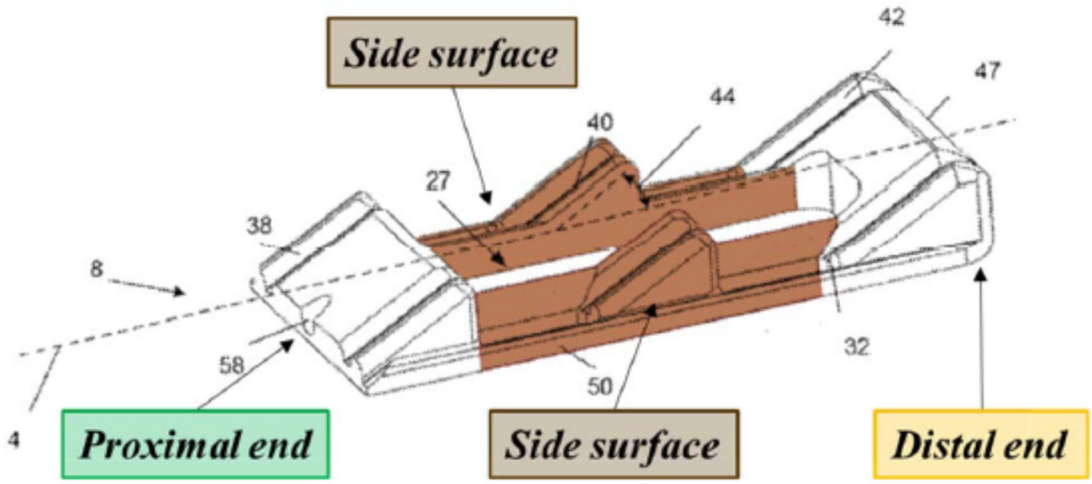
Petitioner argues that Greenhalgh discloses an elongate expander as recited in the claim 1. Pet. 35–39. Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 41–56.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing. Greenhalgh's expandable support device has a middle part that is inserted into the expanding device between the base and the top. An excerpt of Figure 1a of Greenhalgh as annotated by Petitioner reproduced below:



The expandable support device includes middle 8, shown as purple above, and is elongate because it is longer than it is wide and acts upon the top and bottom to expand the support device. Pet. 36 (citing Ex. 1004, 4:56–67; Ex. 1003 ¶ 89).

The same excerpt of Figure 1a of Greenhalgh as further annotated by Petitioner showing additional details reproduced below:



Pet. 37 (citing 1004, 6:66–7:9; Ex. 1003 ¶ 89). The middle 8 part of the expandable support device as shown has "a distal or leading end [orange], a proximal or trailing end [green], and a pair of side surfaces connecting the proximal and distal ends [brown]." *Id.* at 36 (citing Ex. 1004, 4:56–67) (alteration in original).

e) Expander Expands the Cage (Element 1e)

Petitioner argues that Greenhalgh discloses an elongate element that acts upon both top and base. Pet. 39–42. Patent Owner argues that (1) the "and/or" language set out in Greenhalgh is aspirational and broadens the disclosure, and (2) that the reference does not disclose moving the base and top apart. Prelim. Resp. 41–46.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing. In particular, Greenhalgh's disclosure that "[t]he top 10 and/or base 6 [of the support device, i.e. cage,] can have a series of unidirectional and/or bidirectional ramps." Ex. 1004, 5:56–57. Greenhalgh also discloses that "[t]he middle 8 can have a series of unidirectional and/or bidrectional ramps." *Id.* at 5:60–61. Greenhalgh also

discloses that the support device is expanded by translating the components in the longitudinal direction. Pet. 39–40 (citing Ex. 1003 ¶¶ 93–94; Ex. 1004, 2:55–59 ("The top and/or middle and/or bottom components can have ramps or wedges that produce an opposing force to expand the device when the top and/or middle and/or bottom components are translated relative to each other in the longitudinal direction."), 6:44–46 ("the device can have a height adjusted configuration. The middle 8 can be slidably translated toward the first end."), 7:17–23 ("the height expansion, as shown by arrow, of the top 10 away from the base 6. The height expansion can occur when the device 2 is longitudinally compressed, and/or when the middle 8 is slid with respect to the base 6 toward the first side."), Figs. 5A–5C).

Petitioner explains:

> In embodiments where the top and base have ramps, the middle acts upon the top and base to expand the cage. (Ex. 1003, ¶ 95.) Just as the middle ramps slide against and push upon the top ramps in Figure 3b . . . , ramps on the opposite side of the middle (i.e., the lower surface of the middle opposite ramp 40) would slide against and push upon the base ramps. (*Id.*, ¶ 95.)

Pet. 40–41. Petitioner further explains that "[e]ven in embodiments where the base 6 does not have ramps, the middle 8 still will "act upon" the base to expand the cage body, as claimed." *Id.* at 41 (citing Ex. 1003 ¶ 96).

We first address Patent Owner's argument that the "and/or" language in the Greenhalgh reference is aspirational. Greenhalgh discloses that "[t]he top 10 and/or base 6 can have a series of unidirectional and/or bidirectional ramps." Ex. 1004, 5:56–57. In this case, the excerpt from Greenhalgh describes the basic cage as having a top, a bottom, and a ramp that is inserted between the top and the bottom. The excerpt also describes a cage

where the top has a unidirectional ramp, the bottom has a unidirectional ramp, the top has bidirectional ramp, the bottom has bidirectional ramp, the top and bottom have unidirectional ramps, and the top and bottom have bidirectional ramps. Here, the "and/or" language is used as a way of consolidating the genus of cages disclosed within the reference. It is well settled that the disclosure of a small genus may anticipate a species. *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1380 (Fed. Cir. 2001). For that to be the case, the genus must be limited to the extent that a person of ordinary skill in the art can "at once envisage each member of [the] limited class [of elements embraced by the genus]." *Eli Lilly & Co. v. Zenith Goldline Pharms., Inc.*, 471 F.3d 1369, 1376 (Fed. Cir. 2006); *see also Blue Calypso, LLC v. Groupon, Inc*., 815 F.3d 1331, 1343–44 (Fed. Cir. 2016) ("[A] reference need not always include an express discussion of the actual combination to anticipate. . . . Instead, a reference may still anticipate if that reference teaches that the disclosed components or functionalities may be combined and one of skill in the art would be able to implement the combination."). In this case, we do not find the language in the Greenhalgh reference to be aspirational but instead find that the reference merely describes a small genus of support devices, i.e. cages.

Next, Patent Owner argues that the "[b]ase rail 46 holds the middle rail not the other way around and merely holding something does not equate to 'act upon' within the scope of the 'Expander Expands the Cage' limitation. 'Act upon' requires action, movement, of both the upper portion and the lower portion." Prelim. Resp. 45–46. Patent Owner argues that "to permit expansion of the cage by simultaneously moving the top and the base

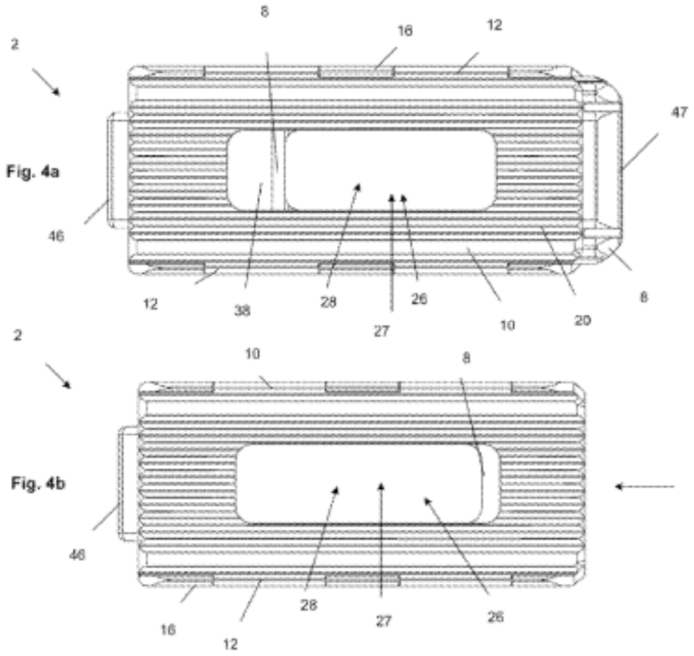
for cage expansion, the ports would also need to be redesigned but such is not enabled by Greenhalgh." *Id.* at 46.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that the expander acts on both top and bottom surfaces. We note that the phrase "act upon" is not defined in the Specification of the '575 patent. The phrase appears for the first time in claim 1 of the '575 patent. Here, Greenhalgh teaches the insertion of element 8 between elements 10 and 6. *See* Ex. 1004, Fig. 2b. Even if element 6 is held in close proximity to middle rail element 8 by the base rail 46 it is not clear that the force exerted on the device is only in one direction. Pet. 40–41 (citing Ex. 1003 ¶ 96 ("Even in embodiments where the base 6 does not have ramps, the middle 8 still *acts upon* the base to expand the cage body. . . . This sliding engagement allows the cage body to expand by separating the top from the base." (emphasis added)).

f) Unobstructed When Viewed from Top (Element 1f)

Petitioner and Patent Owner agree that "unobstructed" means "there are no features lying in the path and blocking the windows." Pet. 25; Prelim. Resp. 34; *see above* II.D. Petitioner argues that "Greenhalgh discloses that the concurrent vertical port is 'substantially unobstructed when the device 2 is in a height-expanded configuration.'" Pet. 43 (citing Ex. 1004, 7:7–9, Fig. 4B); Ex. 1003 ¶¶ 97–98. Patent Owner disagrees. *See* Prelim. Resp. 47–54.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Greenhalgh discloses this unobstructed element. Figures 4A and 4B of Greenhalgh are reproduced below:

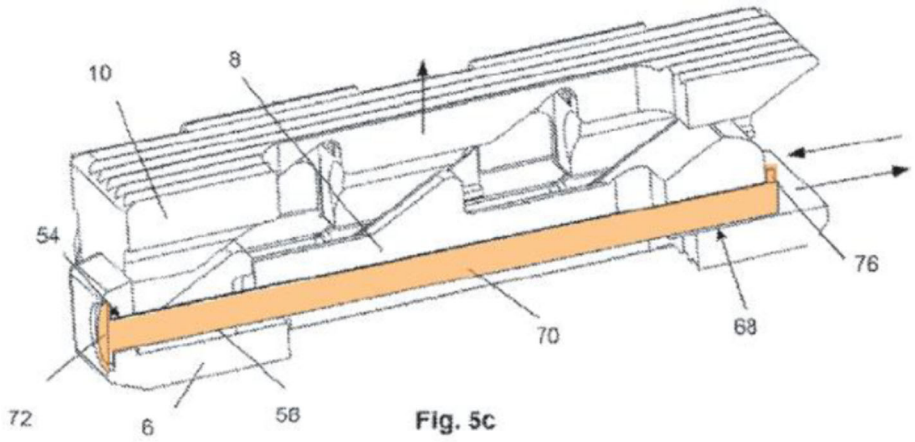


> FIGS. 4a and 4b [reproduced above] illustrate that the top port 26, middle port 27 and base port 28 substantially align transverse with the longitudinal axis 4. The top/middle/base ports form a concurrent vertical port through the device 2. The concurrent vertical port can be filled with any material disclosed herein or left empty. The concurrent vertical port can be partially obstructed by the middle 8, including the middle first ramp 38, when the device 2 is in a height-contracted configuration as shown in FIG. 4a. The concurrent vertical port can be less obstructed, or substantially unobstructed when the device 2 is in a height-expanded configuration, as shown in FIG. 4b.

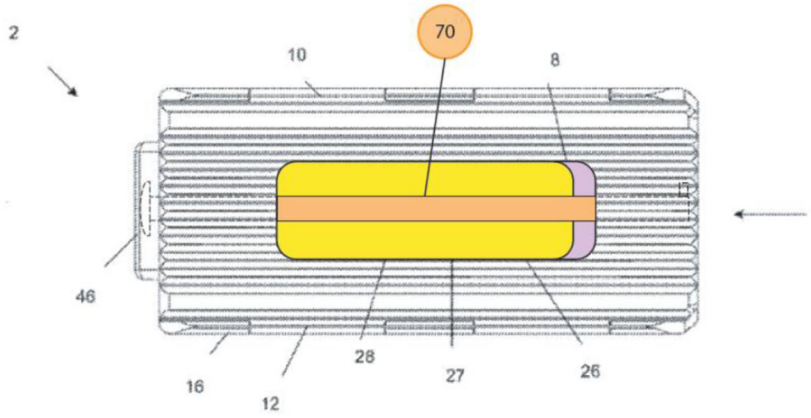
Ex. 1004, 6:66–7:9. Greenhalgh further discloses "that the deployment rod or locking pin 80 can be integral or attached to the middle 8, for example at the second side plate 47. The middle port can be unobstructed by the rod or pin." *Id.* at 7:54–57.

With references to Figure 5c, Patent Owner argues that Greenhalgh teaches "a locking rod" that would obstruct the window. Prelim. Resp. 48

(acknowledging that figure 5c is not relied on in the anticipation challenge). Specifically, Patent Owner provides annotated figures 5c and 4b, reproduced below:



Patent Owner's annotated Figure 5c of Greenhalgh is reproduced above. *Id.* at 48.



Patent Owner's annotated figure 4b is reproduced above. *Id.* According to Patent Owner, "Greenhalgh does not describe how detent 76 may be controlled such that rod 70 may be removed so presumably it remains in place and obstructs the window." *Id.* at 48–49 (citing Ex. 2001 ¶¶ 145, 149–155, 158–160).

Greenhalgh discloses that "[t]he deployment rod 70 can be removably attached from the remainder of the device 2, for example after the device 2 is deployed. The deployment rod 70 can be used to position and expand the device 2." Ex. 1004, 7:58–61.

Patent Owner contends that if the deployment rod is removed than there is a high risk that the device will catastrophically fail by collapsing. Prelim. Resp. 52 (citing Ex. 2001, ¶¶ 111, 165,172–178). The options disclosed by Greenhalgh to prevent such collapse also would prevent the surgeon from reversing an expansion and adjusting the cage during surgery, and therefore, the surgeon would not consider using such tool. *See id.* at 52 ("This ratchet option would prevent a surgeon from reversing the expansion to adjust the height during surgery to the exact amount needed.", citing Ex. 2001 ¶¶ 144–146, 172–178).

We are not persuaded by Patent Owner's contention that the device would not function. "[T]he patentability of apparatus or composition claims depends on the claimed structure, not on the use or purpose of that structure." *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 809 (Fed. Cir. 2002). On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that the windows in at least one embodiment of Greenhalgh's expandable device are unobstructed.

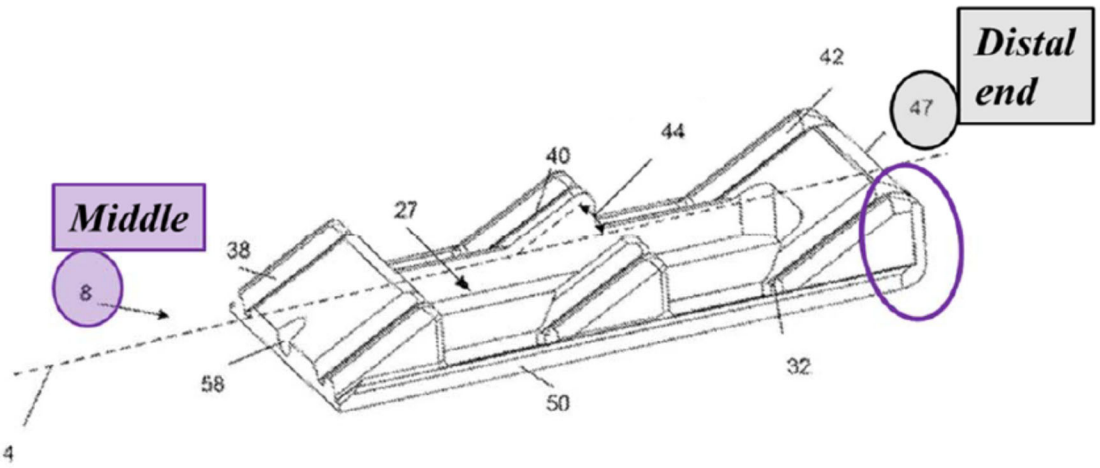
g) Summary of Claim 1

On the record at this stage of the proceedings, Petitioner has demonstrated that it is more likely than not that claim 1 of the '575 patent is anticipated by Greenhalgh.

3. *Analysis of Dependent Claim 5*

Petitioner sets forth arguments and evidence for its assertion that claim 5 is anticipated by Greenhalgh. Pet. 52–53. Patent Owner argues that Petitioner's interpretation of tapered sides does not comport with the patent's description of the invention. *See* Prelim. Resp. 54–56.

Claim 5 recites "wherein the keyed distal end has tapered sides." Ex. 1001, 8:49–50. As discussed above II.D.1, we determine that "keyed distal end" is reasonably construed in light of the Specification to mean that "the distal end is sized and shaped to fit at least partially within a distal cavity and is sized and shaped to engage corresponding surfaces on the upper and lower portions." Petitioner identifies a tapered surface on a keyed distal end, as shown in annotated figure 1a below:



Annotated figure 1a of Greenhalgh shows the elongated expander with a keyed distal end. Pet. 53 (citing Ex. 1003 ¶¶ 107–108).

Patent Owner argues that Petitioner's identification of tapered sides "does not naturally align with the patents description of the invention." Prelim. Resp. 56.

The recitation "wherein the keyed distal end has tapered sides" does not provide guidance on which surface of the keyed distal end the taper needs to be located on. It is not proper to import limitations from the specification into the claims. *In re Trans Texas Holdings Corp.*, 498 F.3d 1290, 1299 (Fed. Cir. 2007). On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing identifying tapered sides on the key distal end.

4. *Analysis of Claims 2–4, 6, and 7*

Petitioner sets forth argument and evidence for its assertion that claims 2–4, 6, and 7 are anticipated by Greenhalgh. Pet. 45–51, 53–56. Patent Owner does not present arguments in the Preliminary Response addressing specific merits of Petitioner's contention, separately from Patent Owner's arguments as to claim 1. *See* Prelim. Resp. 41–54.

Based on our independent review of the evidence in this record, we determine that Petitioner has made an adequate showing that claims 2–4, 6, and 7 are anticipated by Greenhalgh.

5. *Conclusion*

On the record at this stage of the proceedings, Petitioner has demonstrated that it is more likely than not that at least one claim of the '575 patent is anticipated by Greenhalgh.

F. Obviousness of Claims 8 and 9 over Greenhalgh

Petitioner contends that Claims 8 and 9 are unpatentable as obvious over Greenhalgh. Pet. 66–69. Patent Owner argues that "Greenhalgh does not discuss introducing BG [(bone growth)] material into the interior of the

device via the outer port 54 in the base 6, the central port 56 in the top 10, and the inner port 58 in the middle 8." Prelim. Resp. 58–59.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that claim 8 would have been obvious. As articulated by Petitioner, Greenhalgh teaches port 58 which is in communication with port 27 that forms part of the cavity. Pet. 57–58 (citing Ex. 1004, Fig. 1a-1b, 2b, 3b; Ex. 1003 ¶ 117). Greenhalgh teaches adding filler material into the cavity of the expanded device.

> When the expandable support device 2 is in a deployed configuration in vivo, the expandable support device 2 can be partially or substantially filled with a liquid, gel, or solid (e.g., in small parts or granules) filler material, or combinations thereof, such as bone morphogenic powder or any other material disclosed herein or combinations thereof. The filler material can contact or be in near contact with the surrounding tissue near the edge of the ports.

Ex. 1004, 9:30–37. Petitioner acknowledges that "Greenhalgh does not expressly disclose how the surgeon fills the vertical port when the device is in the deployed configuration." Pet. 59. Because the surgeon would have limited access to the cavity once the device is in the deployed position, we determine that Petitioner has sufficiently shown that a person of ordinary skill in the art "would have understood that the only way to pack the internal cavity when the device is in the deployed configuration would be through the first side outer port 54 and first side inner port 58." *Id.* at 61 (citing Ex. 1003 ¶ 120).

Greenhalgh teaches that "[a] deployment tool and/or locking rod 70 can be inserted through the first port and the second side port 68. The deployment rod 70 can have an attached or integral deployment rod cap 72

or nut that can be outside the first port and interference fit with the wall surrounding the first port." Ex. 1004,7: 25–29. For the purposes of this Decision on the current record, Petitioner shows sufficiently that based on the knowledge of one of ordinary skill in the art it would have been obvious "to insert a separate cap (i.e., not attached to the deployment rod) into the first side outer port 54" to prevent any material introduced into the cavity from leaking out. Pet. 68 (citing Ex. 1003 ¶ 129).

Claim 9 recites that the expandable cage further comprises "a tool bore, coaxial with the aperture, sized and shaped to accept an expansion tool."

Greenhalgh teaches "[a] deployment tool and/or locking rod 70 can be inserted through the first port and the second side port 68. The deployment rod 70 can have an attached or integral deployment rod cap 72 or nut that can be outside the first port and interference fit with the wall surrounding the first port." Ex. 1004, 7:25–29. "The deployment rod is an expansion tool because the surgeon uses the rod to pull the middle proximally to expand the expandable support device 2." Pet. 75 (citing Ex. 1003 ¶ 145).

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that claims 8 and 9 are obvious.

G. Obviousness of Claims 8 and 9 over Greenhalgh and Lynn (Ex. 1007)

Petitioner contends that Claims 8 and 9 are unpatentable as obvious over Greenhalgh and Lynn. Pet. 69–71. Patent Owner opposes. Prelim. Resp. 62–63.

1. *Overview of Lynn*

Lynn is titled "Intervertebral Implants and Graft Delivery Systems and Methods" and relates to "spinal fusion, and more specifically, to spinal implants and related systems, tools and methods." Ex. 1007, code (54), 1:15–17. Lynn discloses that implant 1100 includes port 1136 along one of the lateral side walls of implant 1100. *Id.* at 25:64–26:1. Port 1136 can be configured to receive a fill tube "for post-filling, at least partially, an interior chamber or cavity of the implant with grafting agents and/or other fill materials." *Id.* at 26:6–8. Lynn further discloses that a cap or other sealing member 1138 can be secured to port 1136 to "help ensure that grafting and/or filler materials delivered or otherwise positioned within the interior of the implant do not escape through the port 1136." *Id.* at 26:13–17.

2. *Analysis Independent Claims 8 and 9*

Petitioner argues that Lynn describes a cannulated insertion tool assembly has the advantage of not requiring the disengagement of the insertion tool and engagement of a fill tool. Pet. 64 (citing Ex. 1007, 24:39–53; Ex. 1003 ¶ 122). Petitioner concludes that a person of ordinary skill in the art would have been "motivated to use a single tool to deliver the implant and introduce bone growth material for many reasons, including reducing trauma to the patient, shortening the overall length of the surgical procedure, and minimizing opportunities for complications." *Id.* at 65 (citing Ex. 1003 ¶ 124).

Patent Owner argues that because Lynn is a static device one of ordinary skill in the art would not consult Lynn in order to modify Greenhalgh. Prelim. Resp. 62. Patent Owner argues that Petitioner has not

articulated how to modify Greenhalgh to have a large port in order to deliver bone graft material. *Id.* at 63 (citing Ex. 2001 ¶¶ 179–183).

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that claims 8 and 9 are obvious based on the combination of Greenhalgh and Lynn. Elements in claim 8 that overlap with elements in claim 1 as they apply to Greenhalgh are addressed above. *See* II.E.2.(a)–(g). Lynn teaches a spinal implant having four sides and that is adapted to receive at least one graft and/or fill material. Ex. 1007, Abstract. Figure 20 of Lynn, reproduced below, shows a spinal implant.

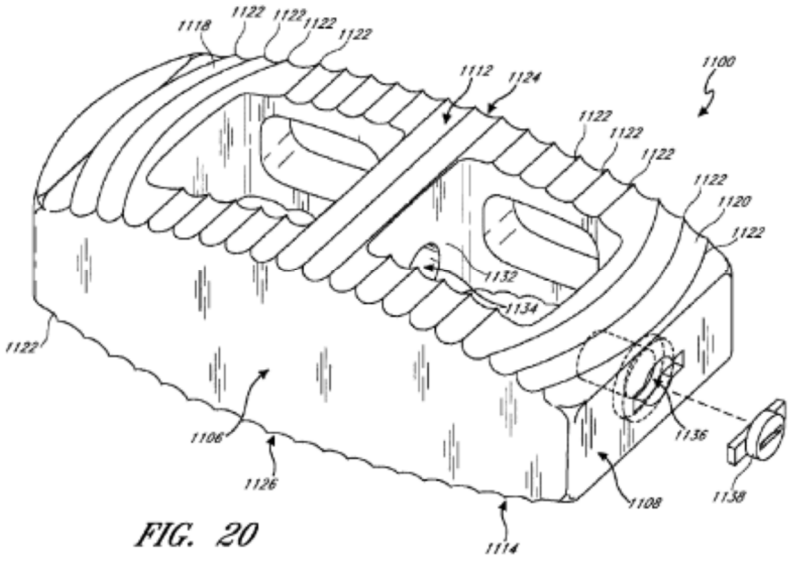


FIG. 20

Figure 20 shows "a cap or other sealing member 1138 can be secured to the port 1136. Such a cap 1138 can help ensure that grafting and/or filler materials delivered or otherwise positioned within the interior of the implant do not escape through the port 1136." Ex. 1007, 26:13–17. "[P]ort 1136 can be configured to receive an implant delivery tool (e.g., to assist a surgeon in moving the implant through the patients anatomy to a target intervertebral

space) . . . . [and] can serve a dual purpose related to implant positioning and graft delivery." *Id.* at 26:3–11.

The obviousness analysis "can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 418 (2007). Making elements of a device integral or separable is considered an obvious design choice and does not render an invention patentable. *See In re Larson*, 340 F.2d 965, 968 (CCPA 1965); *see also KSR*, 550 U.S. at 417 ("[W]hen a patent 'simply arranges old elements with each performing the same function it had been known to perform' and yields no more than one would expect from such an arrangement, the combination is obvious.").

Here, Petitioner's expert Mr. Culbert explains that one of ordinary skill in the art would have been motivated to use a single tool to both deliver the implant and introduce bone growth material. Ex. 1003 ¶ 124. Specifically, Mr. Culbert explains that "inserting a new tool into a small opening in the expandable device once the surgeon had implanted the expandable device would be very difficult and, at a minimum, very time consuming." *Id.* Petitioner's expert further explains that "reducing the number of tools can [save time and] also reduce trauma." *Id.* This conclusion is supported by Lynn which suggests that the implant delivery tool can serve dual purpose of implant positioning and graft delivery. Ex. 1007, 26:3–11; Ex. 1003 ¶ 123.

Greenhalgh already teaches including bone growth material in the cage formed by the top/middle/base ports. Ex. 1004, 7:1–4. Specifically, Greenhalgh teaches that

> When the expandable support device 2 is in a deployed

> configuration in vivo, the expandable support device 2 can be partially or substantially filled with a liquid, gel, or solid (e.g., in small parts or granules) filler material, or combinations thereof, such as bone morphogenic powder or any other material disclosed herein or combinations thereof. The filler material can contact or be in near contact with the surrounding tissue near the edge of the ports.

Id. at 9:30–37. Although Greenhalgh does not described how to insert the bone growth material once the device is positioned, the reference clearly teaches that it can be filled after positioning. Because there are limited access points for placing material into the cavity created by the top/middle/base ports we are persuaded by Petitioner that one of ordinary skill in the art would have looked to Lynn for teaching how to fill a device once deployed.

On the current record, we are not persuaded by Patent Owner's contention that Petitioner has not sufficiently articulated how to achieve delivery of bone grafting material. *See* Prelim. Resp. 63 (citing Ex. 2001 ¶¶ 179–183). Petitioner's combination is not based on bodily incorporating Lynn's dual use tool into Greenhalgh's device but instead suggests that Greenhalgh's positioning device can have dual functions like the device in Lynn. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. . . . Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art."); *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973) ("Combining the teachings of references does not involve an ability to combine their specific structures.") (emphasis omitted)).

On the record at this stage of the proceedings, Petitioner has demonstrated that it is more likely than not that claim 8 of the '575 patent is obvious based on the combination of Greenhalgh and Lynn.

H. Obviousness of Claims 8 and 9 over Greenhalgh and Weiman (Ex. 1005)

Petitioner argues that Claims 8 and 9 are unpatentable as obvious over Greenhalgh and Weiman. Pet. 71–74. Patent Owner opposes. Prelim. Resp. 64–65. Specifically, Patent Owner contends that Petitioner has not articulated "why Greenhalgh's rod should be replaced by Weiman's set screw." *Id.* at 64.

On the record at this stage of the proceeding, we determine that Petitioner has made an adequate showing that claims 8 and 9 would be obvious based on the combination of Greenhalgh and Weiman.[7] Weiman teaches that "bone graft may be packed between the endplates of the adjacent vertebral bodies prior to, subsequent to, or during implantation of the fusion device." Ex. 1005, 6:15–18. Weiman teaches that "the actuator assembly 200 drives the central ramp 18 which forces apart the first and second endplates 14, 16 to place the expandable fusion device in an expanded position." *Id.* at 10:1–4. Petitioner articulates that one of ordinary skill in the art would have been motivated to apply Weiman's actuator screw in Greenhalgh's device because "rotating the assembly would require less force than pulling the deployment rod and would reduce the risk of dislodging the device." Pet. 72–73 (citing Ex. 1003 ¶ 139). Accordingly, we

[7] We address Patent Owner's contention that Weiman does not qualify as prior art below. *See* II.I.2.

are not persuaded by Patent Owner's contention (*see* Prelim. Resp. 64) that Petitioner has not provided a sufficient reason to use Weiman's set screw in place of Greenhalgh's rod.

On the record at this stage of the proceedings, Petitioner has demonstrated that it is more likely than not that claim 8 of the '575 patent is obvious based on the combination of Greenhalgh and Weiman.

I. Anticipation of Claims 1–9 based on Weiman

Petitioner argues that claims 1–9 are unpatentable as anticipated by Weiman. Pet. 75–105. Patent Owner opposes. Prelim. Resp. 41–56.

1. *Overview of Weiman*

Weiman is titled "Expandable Fusion Device and Method of Installation Thereof" and relates to an "apparatus and method for promoting an intervertebral fusion, and more particularly relates to an expandable fusion device capable of being inserted between adjacent vertebrae to facilitate the fusion process." Ex. 1005, code (54), 1:15–19. An exemplary expandable fusion device is depicted in Figure 67, reproduced below.

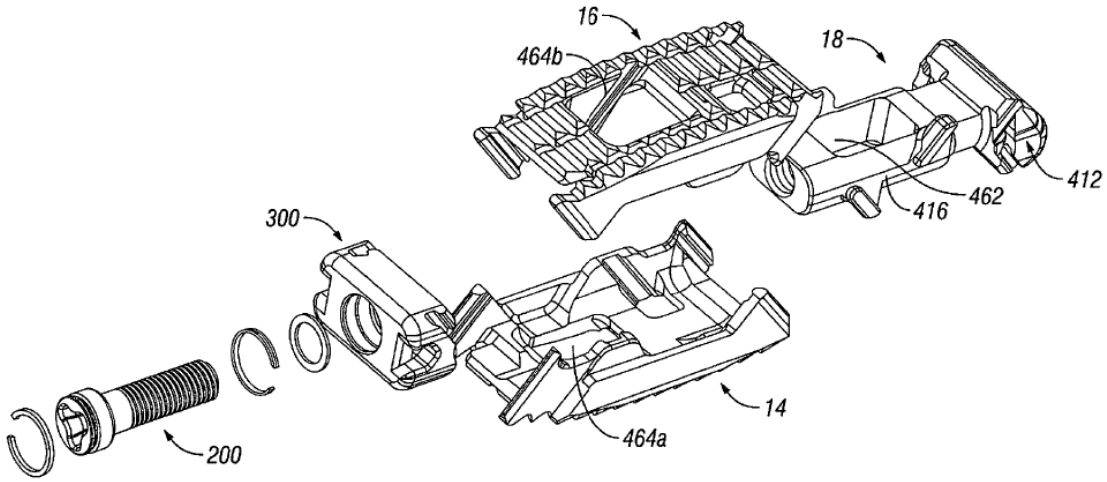


FIG. 67

Figure 67 is an exploded view of an embodiment of an expandable fusion device. *Id.* at 5:22–23. Expandable fusion device 10 includes first endplate 14, second endplate 16, central ramp 18, actuator assembly 200, and driving ramp 300. *Id.* at 24:61–63. Actuator assembly 200 is threadingly engaged with the rod receiving extension 416 of central ramp 18; thus, as actuator assembly 200 is rotated in a first direction, central ramp 18 is pulled toward actuator assembly 200. *Id.* at 23:48–51. As central ramp 18 is pulled towards actuator assembly 200, central ramp 18 acts to push endplates 14, 16 outwardly into the expanded position. *Id.* at 24:56–58. Rod-receiving extension 416 includes a radial through opening or window 462 that is "sized to receive bone graft or similar bone growth inducing material and allow bone graft or similar bone growth inducing material to be packed into the device 10." *Id.* at 24:65–25:3. Weiman explains that "window 462 may align with through openings 464a, 464b in the first endplate 14 and second endplate 16, respectively." *Id.* at 25:4–6.

2. *Weiman as Prior Art*

According to Petitioner, the asserted prior art relied on in the Petition qualifies as art under AIA 35 U.S.C. §102(a) because they were either published or filed by another before the '575 patent's earliest effective filing date of August 8, 2012. Pet. 17. Petitioner explains that Weiman (Ex. 1005) was filed on June 25, 2012,[8] and issued on October 7, 2014, therefore, Weiman is prior art to the '575 patent under AIA 35 U.S.C. §102(a).

[8] Weiman (Ex. 1005) is a continuation-in-part of an earlier application that was before the Examiner during prosecution. In the Petition, "Petitioner relies on the added subject matter in Weiman that was never before the Examiner." Pet. 17.

In a post-grant review, as in an *inter partes* review, "the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). As June 25, 2012, pre-dates the earliest effective filing date for the '575 Patent (August 8, 2012), we find that Petitioner has met their initial burden to show that Weiman is prior art. *See Core Survival, Inc. v. S & S Precision, LLC*, PGR2015-00022, Paper 8at 9 (PTAB Feb. 19, 2016) ("As *Dynamic Drinkware* makes clear, the initial burden of production for showing an earlier priority date [for the invention] rests with the patent owner, not the petitioner.") (citing *Dynamic Drinkware*, 800 F.3d at 1379–80).

Patent Owner attempts to disqualify Weiman as prior art, arguing that "the inventions of the '575 Patent were made before Weiman's filing date of June 25, 2012. . . . Dr. James Robinson, conceived of the cage assemblies of claims 1-9 of the '575 Patent well before that date." Prelim. Resp. 65–66. To remove Weiman as a prior art reference, Patent Owner must produce evidence showing either (1) conception and reduction to practice before Weiman's filing date; or (2) conception before Weiman's filing date combined with diligence up to reduction to practice after that date. *See Taurus IP, LLC v. DaimlerChrysler Corp.*, 726 F.3d 1306, 1323 (Fed. Cir. 2013).

In support of the position that Dr. Robinson conceived of the claimed cages prior to Weiman's filing date of June 25, 2012, Patent Owner provides the Robinson declaration (Ex. 2026), patentability searches (Ex. 2020;

Ex. 2021; Ex. 2030), and production drawings (Ex. 2013). *See* Prelim. Resp. 65–66, *see also id.* at 71–79. In addition, Patent Owner argues that the invention was constructively reduced to practice at least in the period leading up to the provisional application that was filed on August 8, 2012, citing correspondence (Ex. 2017), drafts of provisional patent application (Ex. 2022; Ex. 2023), revisions to the draft application (Ex. 2025) in support. *See* Prelim. Resp. 79–82. Finally, Patent Owner argues that in light of the collection of evidence spanning "the 45-day period of June 24, 2012 to August 8, 2012, it would be reasonable to conclude that the inventions were not abandoned or unreasonably delayed." *Id.* at 84. Based on these disclosures, Patent Owner "swears behind" the Weiman reference.

The antedating issue, now having been raised by Patent Owner after Petitioner met their initial burden, may be explored at trial. Petitioner may raise arguments and evidence that is fairly responsive to Patent Owner's contentions on the proper priority date to be accorded Weiman's relevant disclosures. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1080–82 (Fed. Cir. 2015) (holding that rebuttal evidence may be appropriate when needed to explain, repel, counteract, or disprove an adversary's evidence).

3. *Analysis of Independent Claim 1*

a) Preamble (Element 1a)

Petitioner argues that Weiman discloses an expandable cage for insertion between vertebra. Pet. 73. Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 85–94.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Weiman's device discloses an

expandable cage. Specifically, Weiman discloses "an expandable fusion device capable of being inserted between adjacent vertebrae to facilitate the fusion process." Ex. 1005, 1:17–19.

b) Cage (Element 1b)

Petitioner argues that Weiman discloses a cage having an upper portion and a lower portion, the upper portion having an upper bone contact surface and an upper portion lower surface, the lower portion having a lower bone contact surface and a lower portion upper surface. Pet. 77–80 (see annotated Fig. 67; Ex. 1003 ¶ 151). Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 85–94.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Weiman's device discloses an expandable cage. Specifically, Weiman discloses that the "expandable fusion device 10 includes a first endplate 14, a second endplate 16, a central ramp 18, an actuator assembly 200, and a driving ramp 300." Ex. 1005, 24:61–63, Fig. 67).

c) Window (Element 1c)

Petitioner argues that Weiman discloses openings that are windows. Pet. 79–70 (citing Ex. 1005, 24:67–25:6, *see also* 17:48-52 (explaining that the openings receive bone graft); Ex. 1003 ¶ 153). Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 85–94.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Weiman's device contains windows. Specifically, Figure 67 of Weinam is reproduced below:

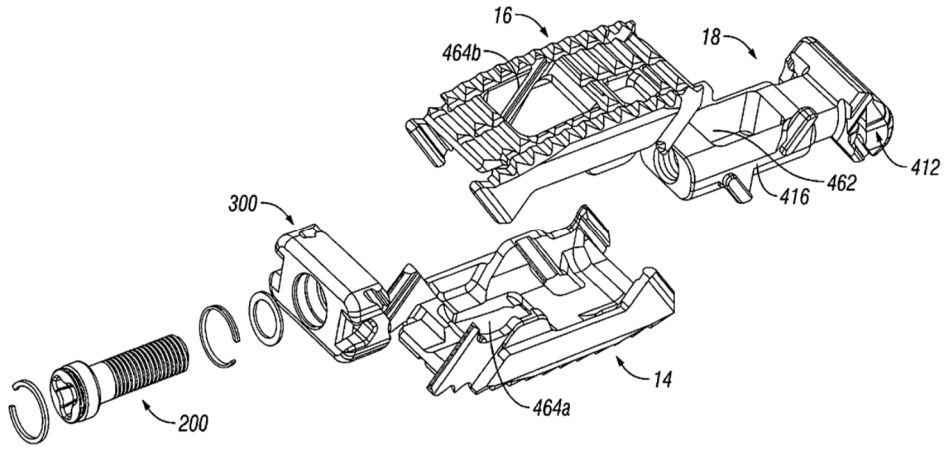


FIG. 67

Figure 67 shows an expandable fusion device. The expandable fusion device includes a first endplate 14, a second endplate 16, a central ramp 18, an actuator assembly 200, and a driving ramp 300. Ex. 1005, 24:60–64.

> [T]he window 462 may be sized to receive bone graft or similar bone growth inducing material and allow bone graft or similar bone growth inducing material to be packed into the device 10. In some embodiments, the window 462 may align with through openings 464a, 464b in the first endplate 14 and second endplate 16.

Ex. 1005 24:67–25:5.

d) Elongate Expander (Element 1d)

Petitioner argues that Weiman discloses an elongate expander (central ramp 18) as recited in the claim 1. Pet. 80–82 (citing Ex. 1005, 20:50–21:3, 23:56–24:4; 24:60–67; Ex. 1003 ¶¶ 154–156). Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 85–94.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Weiman's device contains elongate expander. Specifically, Weiman discloses that "the actuator

assembly 200 drives the central ramp 18 [as shown in figure 67 above] which forces apart the first and second endplates 14, 16 to place the expandable fusion device in an expanded position." Ex. 1005, 10:1–4.

e) Expander Expands the Cage (Element 1e)

Petitioner argues that Weiman discloses an elongate expander that acts upon both first and second endplate. Pet. 83–84. Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 85–94.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Weiman's device contains elongate expander. Specifically, Weiman discloses that when "the central ramp 18 is pulled towards the actuator assembly 200, the central ramp 18 acts to push endplates 14, 16 outwardly into the expanded position." Ex. 1005, 23:56–58.

f) Unobstructed When Viewed from Top (Element 1f)

Petitioner argues that Weiman discloses windows that are unobstructed. Pet. 84–87. Patent Owner opposes. *See* Prelim. Resp. 85–94.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing. Petitioner relies on the features disclosed in Weiman's Figure 67 to show that claim 1 is anticipated. Figure 67 of Weiman is reproduced below:

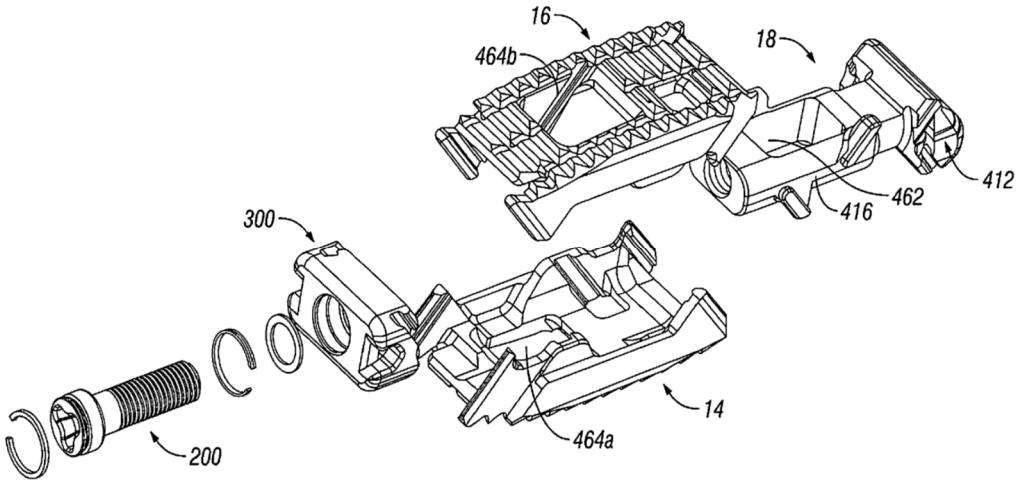


FIG. 67

Petitioner identifies that the central ramp is offset distally in the unexpanded position and therefore the windows would only partially align. Pet. 85. As the central ramp is pulled proximally during deployment, the windows between the ramp and endplates would increasingly align. *Id.* at 85 (citing Ex. 1003 ¶ 161). Petitioner argues that "[t]he actuator assembly is not long enough to lie in the path and block the opening 462 like a bar on a window. . . . Consequently, the windows are open and unobstructed in the expanded configuration and Weiman discloses this limitation." *Id.* at 87 (citing Ex. 1003 ¶ 162).

Patent Owner argues that Weiman's windows are obstructed. Patent Owner acknowledges that "Weiman does not provide a cross-sectional view of the Figure 67 Embodiment. However, a cross-sectional view would look much like those of the embodiment depicted in Figures 64–67 ("Figures 64–66 Embodiment"), as shown below." Prelim. Resp. 87 (citing Ex. 2001 ¶¶ 194, 195, 204–211); Ex. 1005, 24:63–67 ("The expandable fusion device 10 shown on FIG. 67 is similar to the embodiment described above

with respect to FIGS. 64–66, except the rod-receiving extension 416 includes a radial through opening or window 462."). Patent Owner's annotated figures 65 and 66 of Weiman are reproduced below.

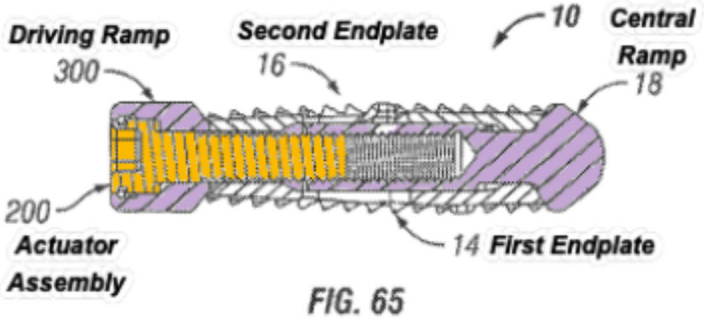


FIG. 65

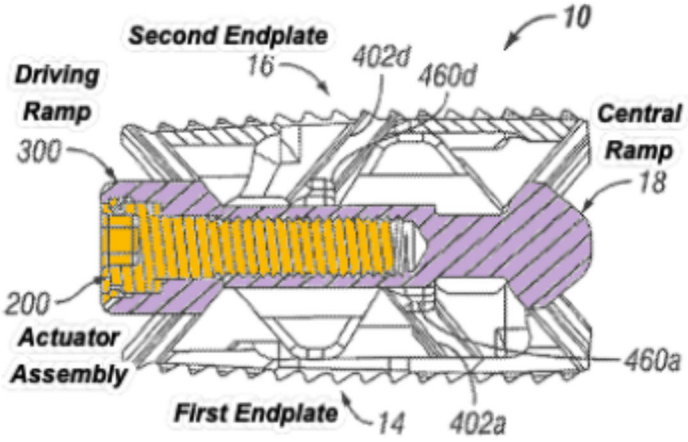
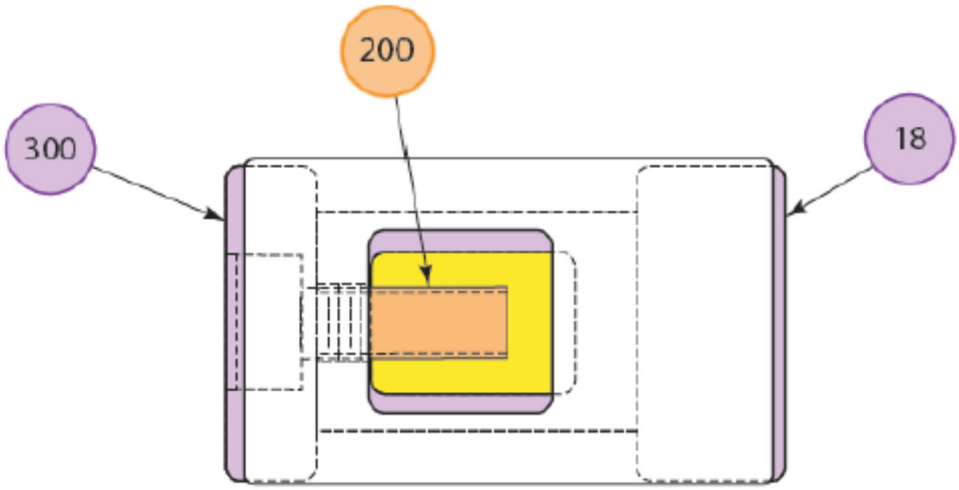


FIG. 66

The annotated figures show the positon of Weiman's actuator in the collapsed and expanded position for one of the disclosed embodiments. Prelim. Resp. 88.

Patent Owner, relying on Patent Owner's expert Dr. Serhan, provides a visualized component figure of a top view of Figure 67 in the expanded position.



"This view shows the configuration after the central ramp 18 has been pulled toward driving ramp 300, which results in the threaded bore of the actuator assembly 200, 300 extending across the windows and obstructing them." Prelim. Resp. 89 (citing Ex. 2001 ¶¶ 196–203; 212–215).

Petitioner explains that "the plain meaning of an 'open' window is well understood to be a state allowing passage through the window.' Pet. 21 (citing Ex. 1003 ¶ 63). According to Petitioner, Patent Owner expressly defined "unobstructed" during prosecution to "mean there are no features lying in the path and blocking the window." *Id.* at 21–22. An example of an obstructing feature identified during prosecution is an axel (or jack screw) that extends down the center which acts like a bar. *Id.* at 22 (citing Ex. 1002, 29–30).

On the current record, we determine that Petitioner has sufficiently shown that the window in Figure 67 is not obstructed because the actuator does not reach all the way across the opening. Pet. 87 (citing Ex. 1003 ¶ 162). Here, Patent Owner's visualized component figure, reproduced above, agrees with Petitioner's interpretation that the actuator does not reach all the way across the window. Because the actuator does not reach all the

way across the window the evidence at this stage of the proceeding persuades us that the Petitioner has made an adequate showing that the claim element is anticipated by Weiman.

g) Summary Claim 1

On the record at this stage of the proceedings, Petitioner has demonstrated that it is more likely than not that claim 1 of the '575 patent is anticipated by Weiman.

4. *Analysis of Claim 8*

Petitioner sets forth argument and evidence for its assertion that claim 8 is anticipated by Weiman. Pet. 97–103. Patent Owner opposes. *See* Prelim. Resp. 94–98. Patent Owner argues that "the actuator assembly is only hollow in the head portion 324. *Id.* at 96 (citing Ex. 2001 ¶¶ 231–234).

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing. Specifically, Weiman discloses that "the actuator assembly 200 includes a head portion 324, an extension 404, and a through bore 406 that extends longitudinally through the actuator assembly 200." Ex. 1005, 18: 55–58. Based on this disclosure we determine that the Weiman provides an actuator that has a hollow part or tube going through the actuator. Weiman additionally discloses that "bone graft [material] may be packed between the endplates of the adjacent vertebral bodies prior to, subsequent to, or during implantation of the fusion device." *Id.* at 6:15–18. This disclosure supports the position that the internal portion of the cage is accessible for packing bone graft material.

5. *Analysis of Claims 2–7, 9*

Petitioner sets forth argument and evidence for its assertion that claims 2–7, and 9 are anticipated by Weiman. Pet. 89–97, 103–105. Patent

Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 85–94.

Based on our independent review of the evidence in this record, we determine that Petitioner has made an adequate showing that claims 2–7 and 9 are anticipated by Weiman.

J. Obviousness of Claims 1–9 over Weiman

Petitioner argues that Claims 1–9 are unpatentable as obvious over Weiman. Pet. 75–105. Patent Owner opposes. 85–98.

Above we determined that if Weiman is prior art as argued by Petitioner, Weiman would anticipate at least one claim of the '575 patent. *See above* I.3.(a)–(g). The Supreme Court determined that "Section 314(a) does not require the Director to evaluate every claim individually. Instead, it simply requires a decision whether the petitioner is likely to succeed on 'at least 1' claim." *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018). The Court explained: "[o]nce that single claim threshold is satisfied, it doesn't matter whether the petitioner is likely to prevail on any additional claims; the Director need not even consider any other claim before instituting review." *Id.* (emphasis in original).

K. Anticipation of Claims 1, 4–6, 8, and 9 based on Glerum (Ex. 1006)

Petitioner argues that claims 1, 4–6, 8, and 9 are unpatentable as anticipated by Glerum. Pet. 106–124. Patent Owner opposes. Prelim. Resp. 99–105.

1. *Overview of Glerum*

Glerum is titled "Expandable Fusion Device and Method of Installation Thereof" and relates to an "apparatus and method for promoting

an intervertebral fusion, and more particularly relates to an expandable fusion device capable of being inserted between adjacent vertebrae to facilitate the fusion process." Ex. 1006, code (54), 1:6–10. An exemplary expandable fusion device is depicted in Figure 2, reproduced below.

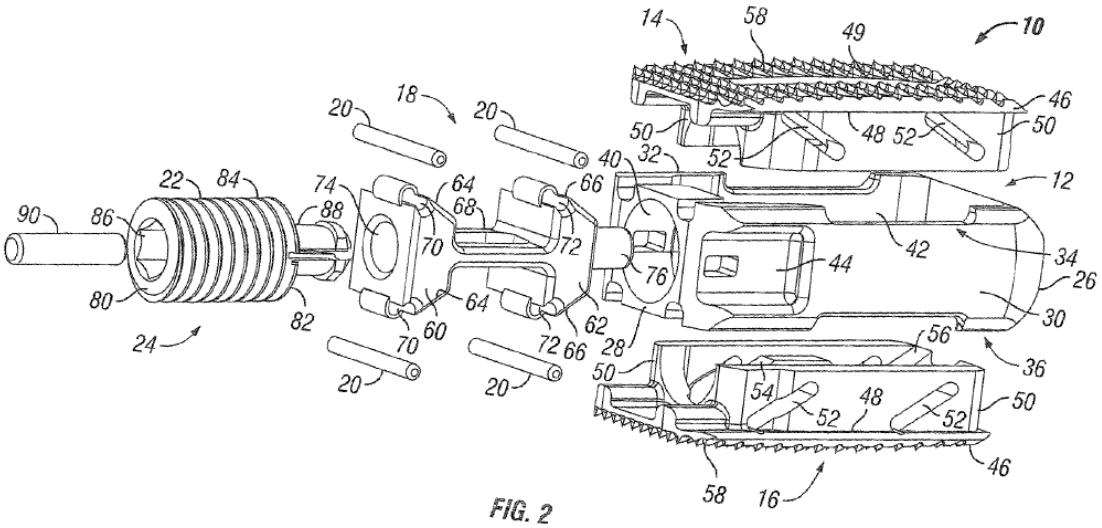


FIG. 2

Figure 2 is an exploded view of an expandable fusion device. Ex. 1006, 2:14. Fusion device 10 includes body portion 12, first endplate 14, second endplate 16, translation member 18, a plurality of pins 20, actuation member 22, and locking mechanism 24. *Id.* at 3:10–13. Glerum explains that "second endplate 16 is substantially identical to the first endplate 14," and each includes a through opening such as through opening 49 that is "sized to receive bone graft or similar bone growth inducing material and further allow the bone graft or similar bone growth inducing material to be packed in the central opening 42 in the body portion 12." *Id.* at 3:50–58. Glerum discloses that translation member 18 includes expansion portions 60, 62 each have angled surfaces 64, 66 configured and dimensioned to engage ramp surfaces 54, 56 of first and second endplates 14, 16. *Id.* at 4:40–43. "As the

translation member 18 moves, the ramped surface 64, 66 of the expansion portions 60, 62 push against the ramped surfaces 54, 56 of the endplates 14, 16 pushing endplates 14, 16 outwardly into the expanded position." *Id.* at 5:59–63.

2. *Analysis of Independent Claim 1*

a) Preamble (Element 1a)

Petitioner argues that Glerum discloses an expandable cage. Pet. 105–106 (citing Ex. 1003 ¶¶ 196–197; Ex. 1006, 1:52–56, Fig. 1)). Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 103–105.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Glerum discloses an expandable cage. Glerum discloses "an expandable fusion device capable of being installed inside an intervertebral disc space to maintain normal disc spacing and restore spinal stability, thereby facilitating an intervertebral fusion." Ex. 1006, Abstract.

b) Cage (Element 1b)

Petitioner argues that Glerum discloses a cage. Pet. 106–108. Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 103–105.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Glerum discloses an expandable cage. Petitioner's annotated figure 1 of Glerum is reproduced below:

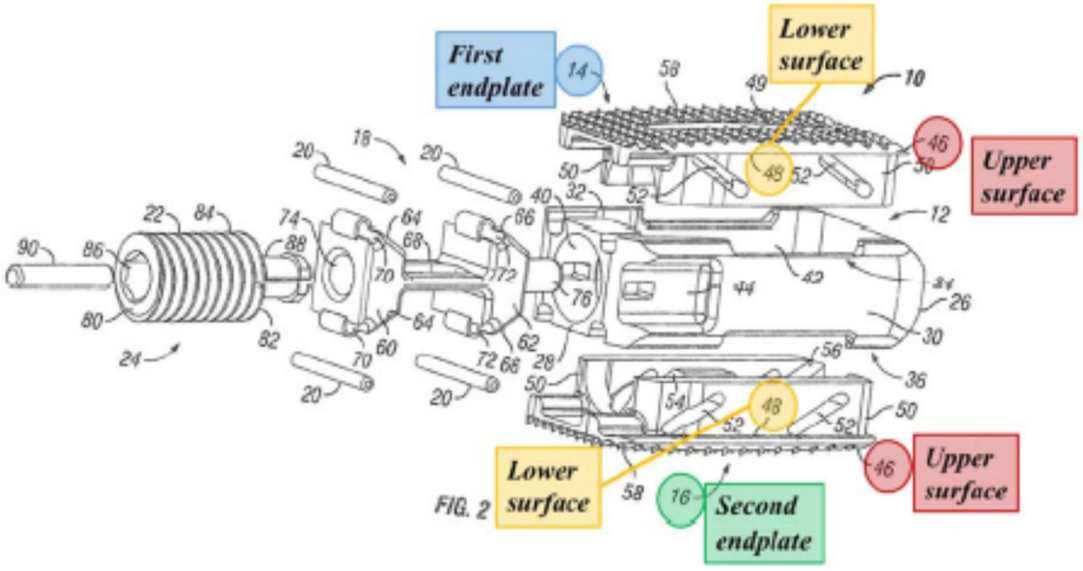


FIG. 2

Glerum's fusion device includes a first endplate 14 (upper portion) [blue], an upper surface 46 (upper bone contact surface) [dark red] and a lower surface 48 (upper portion lower surface) [orange], a second endplate 16 (lower portion) [green], an upper surface 46 (lower bone contact surface) [dark red] and a lower surface (lower portion upper surface) [orange], as well as a window 49. Pet. 106-107 (citing Ex. 1006, 3:14–18, 3:48–58; Ex. 1003 ¶ 200).

c) Window (Element 1c)

Petitioner argues that Glerum discloses windows. Pet. 108 (citing Ex. 1003 ¶ 87). Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 103–105.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Glerum discloses windows. Glerum discloses a expandable fusion device capable of being installed

inside an intervertebral disc space. Ex. 1006, Abstract. Figure 9 of Glerum, reproduced below, shows a top view of an expandable fusion device.

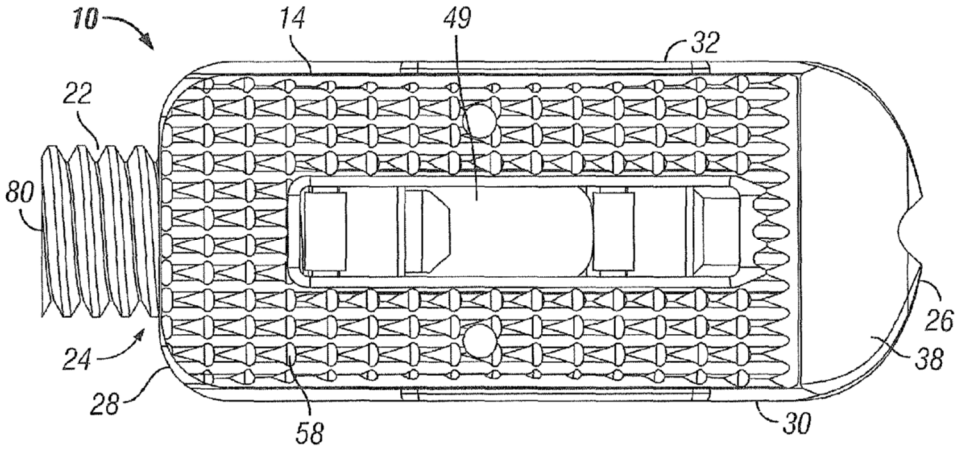


FIG. 9

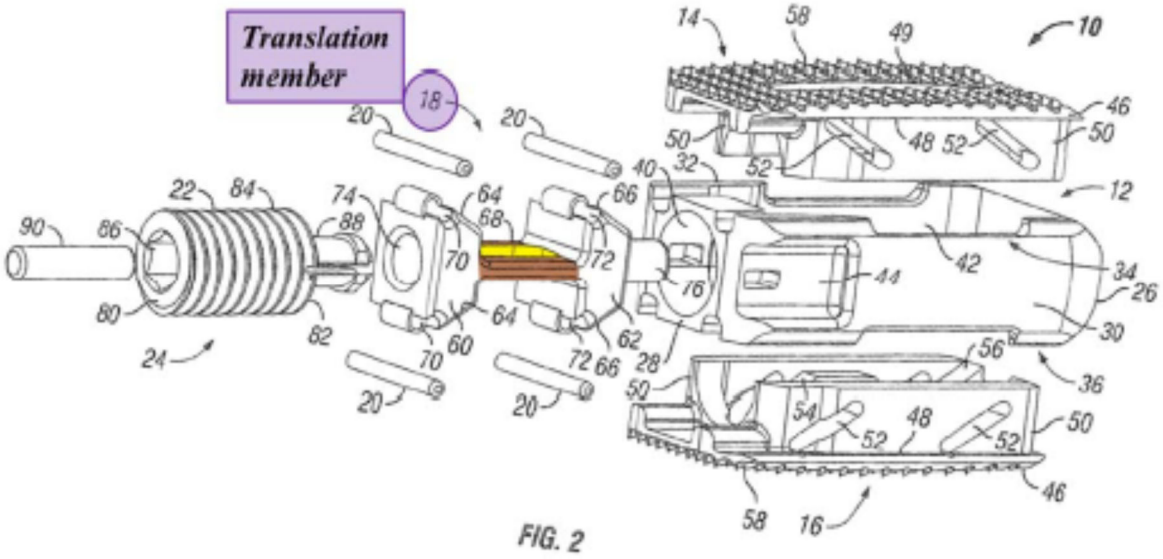
Figure 9 shows "a through opening 49. The through opening 49, in an exemplary embodiment, is sized to receive bone graft or similar bone growth inducing material and further allow the bone graft or similar bone growth inducing material to be packed in the central opening 42 in the body portion 12." *Id.* at 3:54–58.

d) Elongate Expander (Element 1d)

Petitioner argues that Glerum discloses an elongate expander as recited in the claim 1. Pet. 108–111 (citing Ex. 1006, 3:9–13, 4: 34–38, 5:29–32, 5:59–63, Fig. 2, 10, 11; Ex. 1003 ¶ 203). Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 103–105.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Glerum discloses an elongate expander. Glerum discloses that "the translation member 18 moves, the

ramped surface 64, 66 of the expansion portions 60, 62 push against the ramped surfaces 54, 56 of the endplates 14, 16 pushing endplates 14, 16 outwardly into the expanded position." Ex. 1006, 5:59–63. Petitioner's annotated figure 2 from Glerum, reproduced below, highlights the translation member.



Pet. 110. Petitioner argues that "[t]he translation member 18 is an elongate expander because the member is longer than it is wide . . . , and acts upon the first and second endplates to expand the fusion device." *Id.* at 111 (citing Ex. 1006, 5:59-63, Figs. 10–11; Ex. 1003 ¶ 203.)

Glerum describes:

> [T]he translation member 18 includes a first expansion portion 60 and a second expansion portion 62, the expansion portions 60, 62 being connected together via a bridge portion 68. It is also contemplated that there may be more than two expansion portions where each of the expansion portions is connected by a bridge portion. The expansion portions 60, 62 each have angled surfaces 64, 66 configured and dimensioned to engage the ramp surfaces 54, 56 of the first and second endplates 14, 16.

Ex. 1006, 4:35–43.

e) Expander Expands the Cage (Element 1e)

Petitioner argues that Glerum discloses an elongate expander that acts upon both top and base. Pet. 111–112 (citing Ex. 1003 ¶¶ 206–209). Patent Owner does not present arguments in the Preliminary Response addressing the specific merits of Petitioner's contention. *See* Prelim. Resp. 103–105.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Glerum discloses an elongate expander that expands the cage element. Specifically, Glerum discloses that "[t]he expansion portions 60, 62 each have angled surfaces 64, 66 configured and dimensioned to engage the ramp surfaces 54, 56 of the first and second endplates 14, 16." Ex. 1006, 4:40–43; *see above* II.K.2.(d) (Fig. 2). "As the translation member 18 moves, the ramped surface 64, 66 of the expansion portions 60, 62 push against the ramped surfaces 54, 56 of the endplates 14, 16 pushing endplates 14, 16 outwardly into the expanded position." Ex. 1006, 5:59–63; *see above* II.K.2.(d) (Fig. 2).

f) Unobstructed When Viewed from Top (Element 1f)

Petitioner and Patent Owner agree that "unobstructed" means "there are no features lying in the path and blocking the windows." Pet. 25; Prelim. Resp. 34; *see above* II.D. Petitioner argues that Glerum discloses open and unobstructed windows. Pet. 111–112 (citing Ex. 1003 ¶¶ 206–209). Patent Owner disagrees. *See* Prelim. Resp. 103–105.

On the record at the stage of the proceeding, we determine that Petitioner has made an adequate showing that Glerum discloses unobstructed windows. Glerum does not provide a figure showing a top view through the windows of the device in the expanded position. Petitioner provides an

annotated figure 9, reproduced below, showing the through opening, or window.

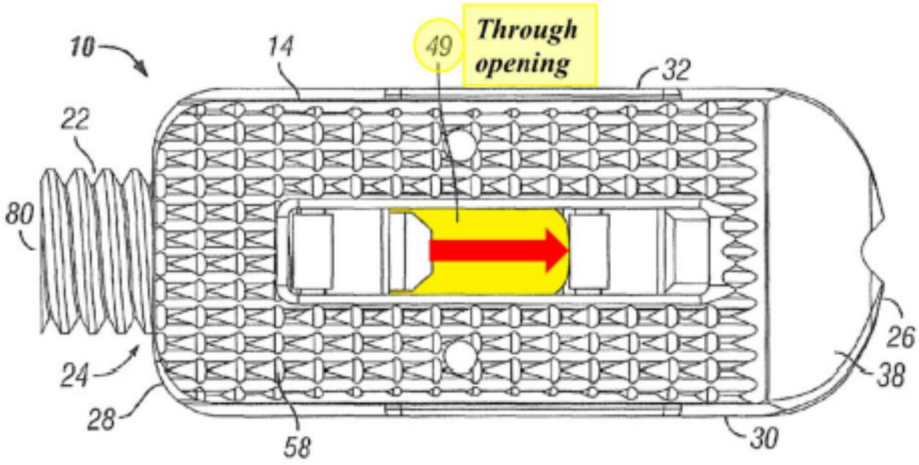
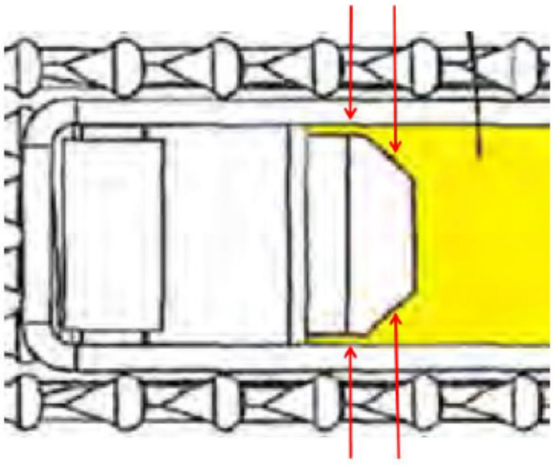


FIG. 9

Petitioner explains that through opening is present in both the expanded and collapsed position.[9] Pet. 114. Glerum discloses that Figure 9 shows "a through opening 49. The through opening 49, in an exemplary embodiment, is sized to receive bone graft or similar bone growth inducing material and further allow the bone graft or similar bone growth inducing material to be packed in the central opening 42 in the body portion 12." Ex. 1006, 3:54–58.

Patent Owner argues that Glerum shows the extension portion 88 extending beyond ramps 64, into the window of translation member 18, and obstructing the window. Prelim. Resp. 100. Below is a magnified version of annotated Figure 9. *Id.* at 102 (citing Pet. 113).

[9] Patent Owner does not contest that the through opening is visible in both collapsed and expanded configuration, instead Patent Owner contends that the opening is obstructed. *See* Prelim. Resp. 102.



According to Patent Owner, the red arrows point to the yellow color in the space above and below the extension 88 along that flat portion of its head. Thus, the extension portion 88 obstructs the window as established by the claim construction in the Petition. Prelim. Resp. 102 (citing Ex. 2001 ¶¶ 240-241). Because the window is obstructed, Patent Owner contends there can be no anticipation. *Id.*

We determine that based on the evidence at this stage in the proceeding that Petitioner has made a sufficient showing. Here, the extension 88 in Glerum does not reach all the way across the opening as argued during prosecution to be an obstruction. *See* Pet. 23; *see also* Ex. 1002, 29–30 ("By unobstructed, applicants simply mean there are no features lying in the path and blocking the windows. The examiner has taken the position that the language 'at least a portion' of the windows as previously presented allows for obstruction as long as there is an open path. The amendment clarifies there are no obstructions, but only open windows when viewed from a top view. This is more analogous to not having any bars on a window or any other feature that blocks the window. The prior art

Baynham et al required an axle obstructing the window extending down the center which acts as a bar.").

A review of Figure 9 in Glerum (*see above*), shows that extension 88 extends into part of the through opening (i.e. window) but does not reach all the way across the opening. At this stage of the proceeding, based on the evidence presented so far, we determine that Petitioner has sufficiently shown that Glerum's windows are open and unobstructed within the meaning argued by Patent Owner during prosecution.

g) Summary Claim 1

On the record at this stage of the proceedings, Petitioner has demonstrated that it is more likely than not that claim 1 of the '575 patent is anticipated by Glerum.

3. *Analysis of Claims 4–6, 8, and 9*

Petitioner sets forth argument and evidence for its assertion that claims 4–6, 8, and 9 are anticipated by Glerum. Pet. 115–124. Patent Owner does not present arguments in the Preliminary Response addressing specific merits of Petitioner's contention, separate from Patent Owner's arguments as to claim 1. *See* Prelim. Resp. 41–54.

Based on our independent review of the evidence in this record, we determine that Petitioner has made an adequate showing that claims 4–6, 8, and 9 are anticipated by Glerum.

L. Obviousness of Claims 8 and 9 over Glerum

Petitioner argues that Claims 8 and 9 are unpatentable as obvious over Glerum. Pet. 117–124. Patent Owner opposes. 103–105.

Above we determined that Glerum would anticipate at least one claim of the '575 patent. *See above* K.2.(a)–(g). The Supreme Court has explained: "[o]nce that single claim threshold is satisfied, it doesn't matter whether the petitioner is likely to prevail on any additional claims; the Director need not even consider any other claim before instituting review." *SAS*, 138 S. Ct. at 1356.

III. CONCLUSION

We conclude that Petitioner has demonstrated that they are more likely than not in prevailing on its assertion that at least one claim of the '575 patent is unpatentable.

At this stage of the proceeding, no final determination has been made as to the construction of any claim term or the patentability of any challenged claim. Our view with regard to any conclusion reached in the foregoing analysis could change upon completion of the record.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 324(a), a post-grant review of claims 1–9 of the '575 patent is instituted with respect to all grounds set forth in the Petition;

FURTHER ORDERED that pursuant to 35 U.S.C. § 324(d) 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.

For PETITIONER:

John Sganga
Joshua Stowell
Rabi Narula
KNOBBE, MARTENS, OLSON & BEAR, LLP
2JBS@knobbe.com
2JYS@knobbe.com
2RNN@knobbe.com

For PATENT OWNER:

Kevin Laurence
Matthew Phillips
Rachel Slade
Derek Meeker
LAURENCE & PHILLIPS IP LAW
klaurence@lpiplaw.com
mphillips@lpiplaw.com
rslade@lpiplaw.com
dmeeker@lpiplaw.com