

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SWM INTERNATIONAL, LLC and
NEXTIER COMPLETION SOLUTIONS INC.,
Petitioner,

v.

DYNAENERGETICS EUROPE GMBH,
Patent Owner.

PGR2021-00097
Patent 10,844,697 B2

Before ERIC C. JESCHKE, RICHARD H. MARSCHALL, and,
JASON W. MELVIN, *Administrative Patent Judges*.

JESCHKE, *Administrative Patent Judge*.

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

I. BACKGROUND

SWM International, LLC and NexTier Completion Solutions Inc. (collectively, “Petitioner”) filed a Petition to institute a post-grant review of claims 1, 2, and 8–10 (the “challenged claims”) of U.S. Patent No. 10,844,697 B2 (Ex. 1001, “the ’697 patent”). Paper 3 (“Pet.”). DynaEnergetics Europe GmbH (“Patent Owner”) filed a Preliminary Response. Paper 9 (“Prelim. Resp.”). With our authorization (Paper 10), Petitioner filed a Preliminary Reply (Paper 12, “Prelim. Reply”) addressing arguments related to discretionary denial based on a prior proceeding challenging claims of the ’697 patent.

We have authority to determine whether to institute a post-grant review. *See* 35 U.S.C. § 324 (2018); 37 C.F.R. § 42.4(a) (2021) (“The Board institutes the trial on behalf of the Director.”). Section 324(a) of Title 35 of the United States Code provides that a post-grant review may not be instituted “unless . . . the information presented in the petition . . . , if such information is not rebutted, would demonstrate that it is more likely than not that at least 1 of the claims challenged in the petition is unpatentable.” Upon consideration of the evidence and arguments in the Petition (including its supporting testimonial evidence) as well as the evidence and arguments in the Preliminary Response (including its supporting testimonial evidence), for the reasons below, we determine that the information presented shows that it is more likely than not that Petitioner would prevail with respect to at least one of the challenged claims. We thus institute a post-grant review on all challenged claims on all asserted grounds. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1354, 1359–60 (2018); 37 C.F.R. § 42.208(a) (“When instituting post-grant review, the Board will

authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

A. Related Proceedings

The parties identify several proceedings involving the ’697 patent:

- *DynaEnergetics Europe GmbH v. NexTier Completion Sols. Inc.*, No. 6:20-cv-01201 (W.D. Tex.), filed Dec. 30, 2020 (amended complaint filed Apr. 30, 2021) (“the W.D. Tex. Litigation”);
- *DynaEnergetics Europe GmbH v. SWM Int’l, LLC*, No. 3:21-cv-00192 (N.D. Tex.), filed Jan. 28, 2021 (“the N.D. Tex. Litigation”);
- *SWM Int’l, LLC v. DynaEnergetics Europe GmbH*, No. 1:21-cv-02315 (D. Col.);
- *DynaEnergetics Europe GmbH v. Yellow Jacket Oil Tools, LLC*, No. 6:20-cv-01110 (W.D. Tex.), filed Dec. 4, 2020¹;
- *PerfX Wireline Servs., LLC v. DynaEnergetics Europe GmbH*, No. 6:21-cv-00970 (W.D. Tex.), filed Dec. 15, 2020²;
- *DynaEnergetics Europe GmbH v. GR Energy Servs. Operating GP LLC*, No. 6:21-cv-00085 (W.D. Tex.), filed Jan. 28, 2021³;

¹ Petitioner states that this litigation was stayed on December 20, 2021. *See* Paper 19 (Petitioner’s Second Updated Mandatory Notices) at 1.

² This matter was transferred from No. 1:20-cv-03665 (D. Colo.). *See* Paper 13 (Patent Owner’s Supplemental Mandatory Notices) at 3.

³ Petitioner states that this litigation was stayed on December 20, 2021. *See* Paper 19 at 2.

- *DynaEnergetics Europe GmbH v. Rock Completion Tools*, No. 6:21-cv-00084 (W.D. Tex.), filed Jan. 28, 2021⁴;
- *DynaEnergetics Europe GmbH v. Nexus Perforating LLC*, No. 4:21-cv-00280 (S.D. Tex.), filed Jan 28, 2021⁵;
- *DynaEnergetics Europe GmbH v. Oso Perforating, LLC*, No. 3:21-cv-00188 (N.D. Tex.), filed Jan. 28, 2021;
- *DynaEnergetics Europe GmbH v. Bear Mfg., LLC*, No. 3:21-cv-00185 (N.D. Tex.), filed Jan. 28, 2021;
- *DynaEnergetics Europe GmbH v. Horizontal Wireline Servs., LLC*, No. 6:21-cv-00349 (W.D. Tex.), filed Apr. 8, 2021;
- *DynaEnergetics Europe GmbH v. PerfX Wireline Servs., LLC*, No. 6:21-cv-00371 (W.D. Tex.), filed Apr. 16, 2021; and
- *G&H Diversified Mfg., LP v. DynaEnergetics Europe GmbH*, PGR2021-00078 (PTAB); and
- *Ex parte* Reexamination No. 90/014,871 (USPTO).

Pet. 1–3; Paper 7 (Patent Owner’s Mandatory Notices) at 1–3; Paper 13 (Patent Owner’s Supplemental Mandatory Notices) at 2–3; Paper 16 (Petitioner’s Updated Mandatory Notices) at 1.⁶ Petitioner also lists applications “in the ’697 Patent family.” *See* Pet. 3.

⁴ Petitioner states that this litigation was dismissed. *See* Paper 19 at 2–3.

⁵ Petitioner states that this litigation was stayed on December 20, 2021. *See* Paper 19 at 2.

⁶ In its Supplemental Notices, Patent Owner listed the following matters (previously listed as open) as closed: *NexTier Completion Sols. Inc. v. DynaEnergetics Europe GmbH*, No. 4:21-cv-01328 (S.D. Tex.), filed Apr.

B. The '697 Patent

The '697 patent relates to perforation gun components for use in well bore perforating in the oil and natural gas industries. Ex. 1001, code (57), 1:24–36. According to the '697 patent, “[a] typical perforation gun system consists of an outer gun carrier arranged in the interior of which there are perforators—usually hollow or projectile charges—that shoot radially outwards through the gun carrier after detonation.” *Id.* at 1:37–40.

Figure 32 is reproduced below:

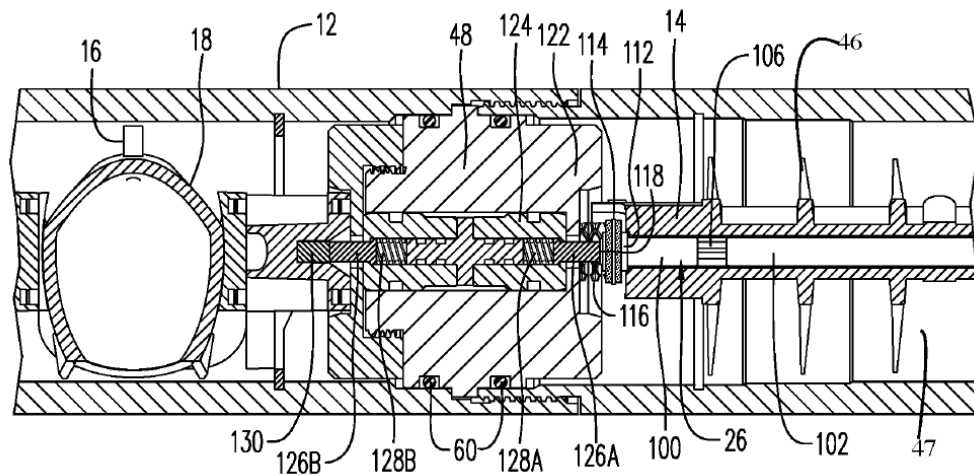


FIG. 32

21, 2021 (“the S.D. Tex. Litigation,” which was transferred to and consolidated with the W.D. Tex. Litigation); *G&H Diversified Mfg., LP v. DynaEnergetics Europe GmbH*, No. 3:20-cv-00376 (S.D. Tex.), filed Dec. 14, 2020 (which was transferred to and consolidated with No. 6:21-cv-01046 (W.D. Tex.)); *DynaEnergetics Europe GmbH v. Vigor USA, LLC*, No. 4:21-cv-00283 (S.D. Tex.), filed Jan. 28, 2021; *DynaEnergetics Europe GmbH v. Oil States Int’l, Inc.*, No. 6:21-cv-00372 (W.D. Tex.), filed Apr. 16, 2021. Patent Owner also list the following consolidated matters: *NexTier Completion Solutions Inc. v. DynaEnergetics Europe GmbH*, No. 6:21-cv-01017 (W.D. Tex.) (consolidated with the W.D. Tex. Litigation) and *G&H Diversified Manufacturing, LP v. DynaEnergetics Europe GmbH*, No. 6:21-cv-01046 (W.D. Tex.) (consolidated with No. 6:20-cv-01110 (W.D. Tex.)).

Figure 32 is a “detailed side view of a tandem seal adapter and detonator.” Ex. 1001, 4:57–58. The embodiment shown in Figure 32 includes, among other components: outer perforation gun carrier 12; shaped charge 18; detonator assembly 26; tandem seal adapter 48; sealing means 60; pressure bulkhead 124; and contact pins 126A and 126B linked to coil springs 128A, 128B. *Id.* at 5:42–46, 7:60–63, 8:31–36. Describing Figure 32 (and Figure 35B below), the ’697 patent discloses that the “dual spring pin connector assembly including the bulkhead 124 and coil springs 128A, 128B is positioned within the tandem seal adapter 48 extending from a conductor slug 130 to the bulkhead connector element.” *Id.* at 8:36–42.⁷

Figure 35B is reproduced below:

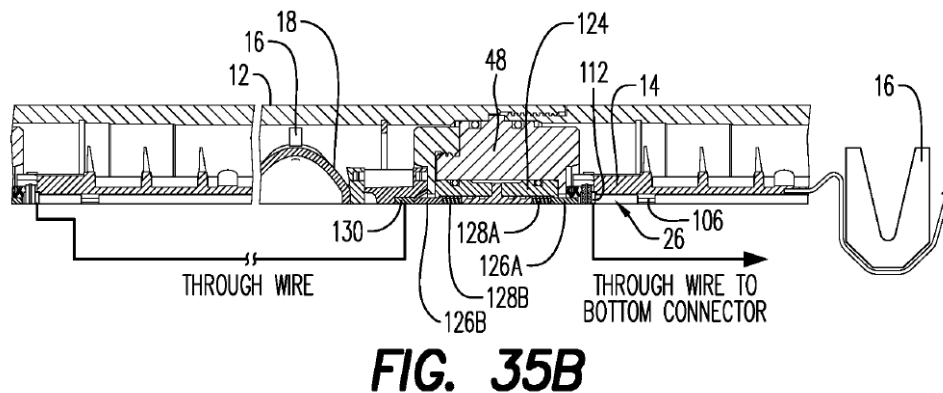


Figure 35B is an “electrical schematic view[] of a detonator and of wiring within a perforated gun system.” Ex. 1001, 4:65–67. Describing Figure 35B (and Figure 32 above), the ’697 patent discloses that “[t]he dual spring pin connector assembly is connected to the through wire 106 of the detonator assembly 26.” *Id.* at 8:36–42.

⁷ In this Decision, we omit emphasis on reference numerals and claim numbers in quotations from the ’697 patent and prior art references.

Figure 28 is reproduced below:

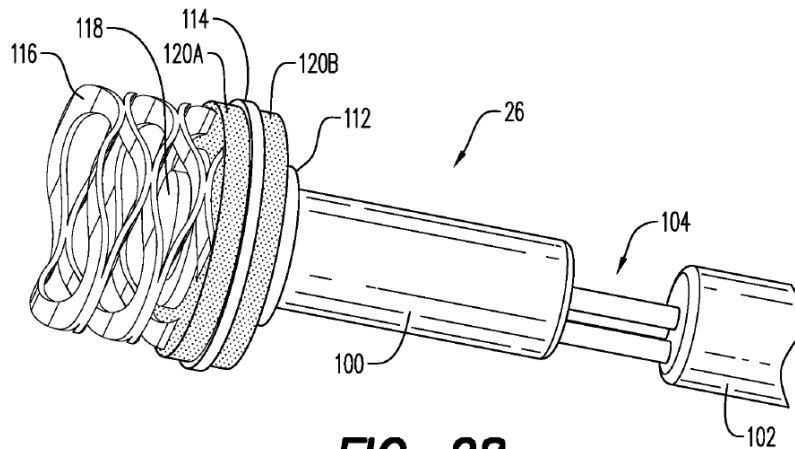


FIG. 28

Figure 28 is a detailed perspective view of a detonator. Ex. 1001, 4:47–50. Detonator assembly 26 shown in Figure 28 includes detonator head 100, detonator body 102, and detonator wires 104. *Id.* at 8:9–13. The '697 patent discloses that depicted

detonator head 100 further includes a through wire connector element 112 connected to the through wire 106 (not shown), a ground contact element 114 for connecting the ground wire 110 to the tandem seal adapter (also not shown), through ground 20 springs 116, and a bulkhead connector element 118 for connecting the signal-in wire 108 to the bulkhead assembly 58 (also not shown).

Ex. 1001, 8:15–22.

C. Challenged Claims

Petitioner challenges claims 1, 2, and 8–10, of which claim 1 is independent. Claims 2, and 8–10 depend from claim 1. Independent claim 1 is reproduced below, with bracketed text added to identify certain language:

1. [1 Preamble] An electrical connection assembly for establishing an electrical connection in a tool string, the electrical connection assembly comprising:

[1.A] a tandem seal adapter having a first end, a second end and a bore that extends from the first end to the second end and entirely through the tandem seal adapter;

[1.B] a perforation gun system comprising a first outer gun carrier, a shaped charge, and a first detonator, wherein the shaped charge and the first detonator are positioned within the first outer gun carrier, [1.C] wherein the first outer gun carrier is connected to the first end of the tandem seal adapter; and

[1.D] a pressure bulkhead having an outer surface, a first end and a second end, the outer surface of the pressure bulkhead is sealingly received in the bore of the tandem seal adapter, [1.E] the pressure bulkhead also having a pin connector assembly extending through the pressure bulkhead from a first pin connector end to a second pin connector end, [1.F] and configured to relay an electrical signal from the first end of the pressure bulkhead to the second end of the pressure bulkhead, [1.G] wherein the first pin connector end extends beyond the first end of the pressure bulkhead and the second pin connector end extends beyond the second end of the pressure bulkhead, [1.H] wherein

the first detonator is in electrical communication with the pin connector assembly, [1.I] wherein the tandem seal adapter and the pressure bulkhead are configured to provide a seal between the detonator and an environment on the second end of the tandem seal adapter.

Ex. 1001, 11:18–47.⁸

D. Asserted Grounds of Unpatentability

Petitioner challenges claims 1, 2, and 8–10 on the following grounds:

⁸ We adopt Petitioner’s designations for the elements of the challenged claims. *See* Pet. 38–60 (showing designations for the language in the challenged claims). We apply these designations below.

Claim(s) Challenged	35 U.S.C. §⁹	Reference(s)/Basis
1, 2, 9, 10	102(a)	SafeJet System ¹⁰
1, 2, 9, 10	102(a)	Goodman ¹¹
1, 2, 9, 10	102(a)	Harrigan ¹²
8	103	SafeJet System, Backhus ¹³
8	103	Goodman, Backhus
8	103	SafeJet System, Harrigan
8	103	Goodman, Harrigan
1, 2, 8–10	112(a)	Written Description
9, 10	112(b)	Indefiniteness

⁹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Pub. L. No. 112-29, §§ 3(b)–3(c), 3(n)(1), 125 Stat. 284, 285–87, 293 (2011). Because the challenged claims of the ’697 patent have an effective filing date after March 16, 2013, we apply the AIA versions of these statutes.

¹⁰ Petitioner states that “[t]he SafeJet System was a perforating gun system from Schlumberger that was on sale and in public use at least as early as January 2009.” Pet. 5. In support, Petitioner relies on (1) Amit Govil, *Selective Perforation: A Game Changer in Perforating Technology-Case Study*, 2012 European and West African Perforating Symposium (Ex. 1005); (2) Declaration of Steve Olsen (Ex. 1006); and (3) Declaration of Daniel Markel (Ex. 1007). Petitioner also relies on Exhibits 1031 and 1032 as evidence of the sale of SafeJet perforating guns. *See* Pet. 5.

¹¹ US 7,762,331 B2, issued July 27, 2010 (Ex. 1026, “Goodman”).

¹² US 2016/0084048 A1, published March 24, 2016 (Ex. 1008, “Harrigan”).

¹³ International Publication No. WO 2011/160099 A1, published December 22, 2011 (Ex. 1010, “Backhus”).

Claim(s) Challenged	35 U.S.C. § ⁹	Reference(s)/Basis
2	112(a)	Enablement

Petitioner supports its challenges with a declaration from Dr. Gary R. Wooley. Ex. 1003 (“the Wooley Declaration” or “Wooley Decl.”). Patent Owner relies on the Declaration of Dr. John Rodgers. Ex. 2001 (“Rodgers Decl.”).

II. DISCUSSION

A. Eligibility for Post-Grant Review

1. Legal Framework

As a threshold matter, we must determine whether the ’697 patent is eligible for post-grant review. The post-grant review provisions in section 6(d) of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (September 16, 2011) (“AIA”) apply only to patents that “contain[] or contained at any time . . . a claim to a claimed invention that has an effective filing date . . . that is on or after [March 16, 2013].” AIA §§ 3(n)(1), 6(d), 6(f)(2)(A), 125 Stat. 284, 293, 305–312 (2011).

Each petitioner for post-grant review must certify that the challenged patent is available for post-grant review. 37 C.F.R. § 42.204(a). In addition, “[a] petition for a post-grant review may only be filed not later than the date that is 9 months after the date of the grant of the patent or of the issuance of a reissue patent (as the case may be).” 35 U.S.C. § 321(c). Petitioner has the burden to demonstrate eligibility for post-grant review. *See Mylan Pharms. Inc. v. Yeda Res. & Dev. Co.*, PGR2016-00010, Paper 9 at 10 (PTAB Aug. 15, 2016).

2. Analysis

Petitioner states that the '697 patent is eligible for post-grant review because “it issued from an application that contains at least one claim with an effective filing date on or after March 16, 2013.” Pet. 4; *see also* Pet. 7 (identifying “the earliest possible effective filing date of the '697 Patent” as July 18, 2013). Petitioner also states that “this Petition is filed within nine months of the November 24, 2020 issue date of the '697 Patent.” *Id.* Patent Owner does not dispute post-grant review eligibility.

On this record, we determine that the '697 patent is eligible for post-grant review. Specifically, the record supports Petitioner’s assertion that the earlier potential priority date is July 18, 2013. Ex. 1001, code (30); Pet. 7. That date falls after March 16, 2013. Also, the Petition was filed on July 21, 2021, which is within nine months of the issuance date of the '697 patent: November 24, 2020. Ex. 1001, code (45); Pet. 4.

B. Discretion Under 35 U.S.C. § 324(a) Based on Parallel Litigation

1. Legal Framework

Section 324(a) of Title 35 states that:

[t]he Director may not authorize a post-grant review to be instituted unless the Director determines that the information presented in the petition filed under section 321, if such information is not rebutted, would demonstrate that it is more likely than not that at least 1 of the claims challenged in the petition is unpatentable.

The portion of the statute reading “[t]he Director may not authorize . . . unless” mirrors the language of 35 U.S.C. § 314(a), which concerns *inter partes* review. This language of sections 314(a) and 324(a) provides the Director with discretion to deny institution of a petition. *See Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016) (“[T]he agency’s decision

to deny a petition is a matter committed to the Patent Office’s discretion.”); Consolidated Trial Practice Guide 55 (Nov. 2019), <https://www.uspto.gov/TrialPracticeGuideConsolidated> (“TPG”).

In exercising the Director’s discretion under 35 U.S.C. §§ 314(a) and 324(a), the Board may consider “events in other proceedings related to the same patent, either at the Office, in district courts, or the ITC.” TPG 58. The Board’s precedential *NHK Spring* decision explains that the Board may consider the advanced state of a related district court proceeding, among other considerations, as a “factor that weighs in favor of denying the Petition under § 314(a).” *NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential).

In addition, the precedential order in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020), identifies factors to consider when a patent owner raises an argument for discretionary denial due to the advanced state of a parallel proceeding:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Fintiv, Paper 11 at 5–6. “These factors relate to whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding.” *Id.* at 6. There is some overlap among these factors and some facts may be relevant to more than one factor. *Id.* In evaluating the factors, the Board takes a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review. *Id.*

2. *Analysis*

Patent Owner argues that we should exercise our discretion to deny institution based on the W.D. Tex. Litigation, the N.D. Tex. Litigation, and the S.D. Tex. Litigation. Prelim. Resp. 41–48. Petitioner opposes. *See* Pet. 130–36. For the reasons below, we are not persuaded that we should exercise discretion to deny institution under 35 U.S.C. § 324(a) based on parallel litigation. We discuss each *Fintiv* factor in turn below.

a. Factor 1: whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted

The first *Fintiv* factor requires consideration of whether the district court has stayed or may stay the proceeding pending post-grant review. “A district court stay of the litigation pending resolution of the PTAB trial allays concerns about inefficiency and duplication of efforts.” *See Fintiv*, Paper 11 at 6.

Petitioner asserts that no party has requested a stay in the W.D. Tex. Litigation or the N.D. Tex. Litigation. *See* Pet. 130. According to Petitioner, “[i]t is unknown and entirely speculative at this point whether the case[s] could be stayed or the trial date (which has not been set as of the time of th[e] Petition) may be otherwise delayed.” *Id.* Petitioner takes the

position “that the Board should decline to speculate as to how either District Court judge might rule on a potential stay request.” Pet. 131.

Patent Owner responds that Petitioner has not moved for a stay in the W.D. Tex. Litigation and that “[e]ven if Petitioner NexTier requested a stay now in the [W.D. Tex. Litigation], it is very unlikely that the particular judge presiding over that case, Judge Albright, would grant such a request.”

Prelim. Resp. 42 (citing *Multimedia Content Mgmt. LLC v. Dish Network LLC*, No. 6:18-CV-00207-ADA, 2019 WL 11706231, at *3 (W.D. Tex. May 30, 2019)). Patent Owner asserts that this factor favors denial. *Id.*

Petitioner NexTier moved to stay the W.D. Tex. Litigation on November 26, 2021, after the filing of the briefing here. *See* Motion to Stay Case, *DynaEnergetics Europe GmbH v. NexTier Completion Sols. Inc.*, No. 6:20-cv-01201 (W.D. Tex. Nov. 26, 2021), ECF No. 64. The W.D. Tex. Litigation was stayed in a text order on December 20, 2021, “pending entry of a final judgment” in PGR2021-00078. *See* Ex. 3003; Paper 19 at 2. As noted in Patent Owner’s Supplemental Mandatory Notices, the S.D. Tex. Litigation was transferred to the Western District of Texas and consolidated with the W.D. Tex. Litigation in October 2021. *See* Paper 13 at 3. Thus, the S.D. Tex. Litigation is stayed as well. *See* Paper 19 at 2. The N.D. Tex. Litigation is not stayed. We view this factor as weighing against exercising discretion to deny. *See Fintiv*, Paper 11 at 6–8.

b. Factor 2: proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision

Under the second *Fintiv* factor, “[i]f the [district] court’s trial date is earlier than the projected statutory deadline, the Board generally has weighed this fact in favor of exercising authority to deny institution.” *See*

Fintiv, Paper 11 at 9. Petitioner states this factor weighs against denial because no trial dates have been set in either the W.D. Tex. Litigation or the N.D. Tex. Litigation. Pet. 131–33. Petitioner adds that “[i]f a trial date were to be set, that date would be anything but certain” because “COVID-19 has already caused significant delays in the district courts nationwide.” Pet. 131. Patent Owner responds that this factor “weighs heavily in favor of denial” because, in the proposed scheduling order in the W.D. Tex. Litigation, trial is “estimated to begin January 3, 2023.” Prelim. Resp. 43 (citing Ex. 2016 (proposed scheduling order in the W.D. Tex. Litigation)).

Because the case is stayed in the W.D. Tex. pending the outcome of PGR2021-00078, it is unlikely trial will occur before a final decision in this proceeding. No trial date has even been proposed in the N.D. Tex. Litigation. Thus, any final written decision in this proceeding will likely precede any trial date in the N.D. Tex. Litigation. On the record here, we determine that this factor weighs against exercising discretion to deny institution.

c. Factor 3: investment in the parallel proceeding by the court and the parties

The third *Fintiv* factor considers “the amount and type of work already completed in the parallel litigation by the [district] court and the parties at the time of the institution decision. Specifically, if at the time of the institution decision, the district court has issued substantive orders related to the patent at issue in the petition, this fact favors denial.” *See Fintiv*, Paper 11 at 9–10. Thus, the more advanced the parallel proceeding, the less likely we are to institute a post-grant review. *Id.* at 10.

Petitioner states that “[b]y the time of the institution deadline, it is uncertain what rulings will have been issued by either of the District Court

judges” in the W.D. Tex. Litigation and the N.D. Tex. Litigation. Pet. 133. Petitioner notes that Patent Owner has filed a motion for preliminary injunction in the N.D. Tex. Litigation, but that “that motion will not be heard for at least several months (Ex. 1038) and might very well have been withdrawn by that time.” Pet. 133–34. According to Petitioner, at the institution decision in this proceeding, “most discovery will remain [in the W.D. Tex. and N.D. Tex. Litigations] and it is unclear whether either District Court judge will have considered any dispositive issues in these cases, including invalidity issues based on the prior art or Petitioner’s arguments under §112.” Pet. 134.

Patent Owner responds that “[t]here has been significant investment by the parties in the [N.D. Tex. Litigation] based on a fully briefed preliminary injunction (‘PI’) motion, which was heard in-person on October 6, 2021” and that, “[a]s a result of the PI, the parties have spent substantial time and resources arguing invalidity and claim construction issues that are duplicative of the issues raised in the Petition.” Prelim. Resp. 43 (citing Ex. 2021 ¶ 6). Patent Owner notes that the parties’ efforts have included “seven depositions, significant early fact discovery, a fully motion to compel, . . . numerous fact and expert declarations,” a motion to dismiss, and completed claim construction briefing. *Id.* at 44. As to the W.D. Tex. Litigation, Patent Owner states that “the parties have already begun conducting discovery, served invalidity and infringement contentions, and are scheduled to conclude claim construction with a hearing on December 20, 2021—over a month prior to the Board’s DI deadline.” *Id.* (citing Ex. 2002 (Declaration of Preston Heard) ¶ 3). As to the S.D. Tex. Litigation, Patent Owner argues that the parties have “begun discovery,

served their preliminary invalidity and infringement contentions and preliminary claim constructions, and fully briefed [Patent Owner's] motion to dismiss, stay, or transfer the case" to the Western District of Texas. *Id.* (citing Ex. 2002 ¶ 5).

On the current record, we are not persuaded that the level and type of investment by the District Courts and the parties at this point in time support exercising discretion to deny institution. As an initial matter, we note that Patent Owner addresses only the W.D. Tex. Litigation for some factors (such as factors 1 and 2 (*see* Prelim. Resp. 42–43)), but addresses the N.D. Tex. Litigation, for example, for factor 3. Turning to the merits, although the parties have invested some time in the parallel litigations, this must be considered in context of the substantial investment required *in the future*. As to efforts by the courts, in the W.D. Tex. Litigation, the District Court has heard claim construction arguments but not issued an order yet. *See Fintiv*, Paper 11 at 10 (“If, at the time of the institution decision, the district court has not issued orders related to the patent at issue in the petition, this fact weighs against exercising discretion to deny institution under *NHK*.”). Patent Owner has not identified any orders substantively addressing the ’697 patent in the S.D. Tex. Litigation, now consolidated with the W.D. Tex. Litigation. In the N.D. Tex. Litigation, the Court has heard arguments on the preliminary injunction issues, but not issued an order. *See* Ex. 2018 (docket report in N.D. Tex. Litigation).

As to the invalidity-related efforts by the parties, in the N.D. Tex. Litigation, Petitioner SWM has presented, in the context of the preliminary injunction motion, some of the same invalidity theories as presented here. *See* Ex. 2021 (Declaration of Gary R. Wooley from the N.D. Tex. Litigation)

¶¶ 26–29 (asserting anticipation of claims 1, 2, 9 and 10 of the ’697 patent based on “the SafeJet system,” “Harrigan,” and “Goodman”). The parties have also provided a joint claim construction statement. *See* Ex. 2018 at 8 (Docket No. 70). As to the W.D. Tex. Litigation, Petitioner NexTier has presented initial invalidity contentions. *See* Ex. 2016 at 2 (showing initial invalidity contentions due August 30, 2021), 4 (showing final invalidity contentions due February 28, 2022). The parties have also presented their claim construction positions at a hearing on December 20, 2021. *See id.* at 3. As to the S.D. Tex. Litigation (now consolidated with the W.D. Tex. Litigation), Petitioner NexTier presented initial invalidity contentions and the parties have briefed claim construction issues. *See* Ex. 2002 ¶ 5.

On balance, we view the parallel litigations as less developed than that in *Sand Revolution II*, in which the panel found this factor weighed “only marginally, if at all, in favor of exercising discretion” when (1) a two-page claim construction order had issued and (2) the defendant had provided invalidity contentions. *Sand Revolution II*, Paper 24 at 10–11. Moreover, before any trials in the parallel litigations, the parties must exchange their final contentions, finish fact discovery, exchange expert reports, take expert depositions, complete briefing on case-dispositive issues, and prepare for trial. *See, e.g.*, Ex. 2016 at 4–6 (proposed scheduling order in the W.D. Tex. Litigation). In addition, the District Courts would have to issue claim construction orders, decide any case-dispositive issues, coordinate pretrial conferences, and prepare for trial. *Id.*

Patent Owner does not allege any delay by Petitioner in filing the Petition. *See Fintiv*, Paper 11 at 11 (“If the evidence shows that the petitioner filed the petition expeditiously, such as promptly after becoming

aware of the claims being asserted, this fact has weighed against exercising the authority to deny institution under *NHK*.”). For these reasons, we determine that the third *Fintiv* factor weighs against exercising discretion to deny institution.

d. Factor 4: overlap between issues raised in the petition and in the parallel proceeding

The fourth *Fintiv* factor requires consideration of “inefficiency and the possibility of conflicting decisions.” *See Fintiv*, Paper 11 at 12. Therefore, “if the petition includes the same or substantially the same claims, grounds, arguments, and evidence, as presented in the parallel proceeding, this fact has favored denial.” *Id.* The *Fintiv* panel stated that “the degree of overlap is highly fact dependent” and encouraged the parties “to indicate whether all or some of the claims challenged in the petition are also at issue in the district court.” *Id.* at 13.

We first address the degree of overlap in issues based on the *claims* at issue in each proceeding. *See Fintiv*, Paper 11 at 13 (“The existence of non-overlapping claim challenges will weigh for or against exercising discretion to deny institution under *NHK* depending on the similarity of the claims challenged in the petition to those at issue in the district court.”).

Petitioner acknowledges that “the same claims at issue in the district court proceedings are also challenged” in this proceeding. Pet. 134. There is complete overlap in the claims at issue between the parallel litigations and this proceeding.

We turn now to the degree of overlap in issues based on the *prior art* at issue in each proceeding. *See Fintiv*, Paper 11 at 12–13 (discussing how, “if the petition includes materially different grounds, arguments, and/or evidence than those presented in the district court, this fact has tended to

weigh against exercising discretion to deny institution”). Petitioner has provided a *Sotera*-style stipulation, agreeing, in the W.D. Tex. and N.D. Tex. Litigations, to not rely on any grounds that form a basis for this proceeding or any grounds that reasonably could have been raised in this proceeding. *See* Ex. 1039 (stipulation letter); *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18 (Dec. 1, 2020) (precedential). As noted by Patent Owner, Petitioner SWM has presented, in the context of the preliminary injunction motion in the N.D. Tex. Litigation, some of the same invalidity theories as presented here. *See* Prelim. Resp. 46. Patent Owner argues that, “[i]n doing so, SWM considerably undermined its ability to assuage the Board’s ‘concerns of inefficiency and the possibility of conflicting decisions.’” *Id.* (quoting *Fintiv*, Paper 11 at 12). Although it is somewhat unclear how the stipulation will apply given that the Northern District of Texas has still not decided the preliminary injunction motion (*see* Ex. 2018), we note that the stipulation will apply to the final invalidity contentions in the W.D. Tex. and N.D. Tex. Litigations. Although there is complete overlap in the claims, because of the stipulation in the W.D. Tex. and N.D. Tex. Litigations, we determine that the fourth *Fintiv* factor weighs strongly against exercising discretion to deny institution.

e. Factor 5: whether the petitioner and the defendant in the parallel proceeding are the same party

Under the fifth *Fintiv* factor, “[i]f a petitioner is unrelated to a defendant in an earlier [district] court proceeding, the Board has weighed this fact against exercising discretion to deny institution.” *See* *Fintiv*, Paper 11 at 13–14. “Even when a petitioner is unrelated to a defendant, however, if the issues are the same as, or substantially similar to, those

already or about to be litigated, or other circumstances weigh against redoing the work of another tribunal, the Board may, nevertheless, exercise the authority to deny institution.” *Id.* at 14.

Petitioners NexTier and SWM are the same parties as in the parallel litigations. Pet. 135; Prelim. Resp. 47. Because any final written decision in this proceeding will likely issue *before* the trial in the W.D. Tex. Litigation, this factor weighs against discretionary denial as to that case.

No trial date has even been proposed, however, in the N.D. Tex. Litigation. Thus, because any final written decision in this proceeding will likely precede any trial date in the N.D. Tex. Litigation, this factor weighs against discretionary denial as to that case. Overall, this factor weighs against discretionary denial.

f. Factor 6: other circumstances that impact the Board’s exercise of discretion, including the merits

In an analysis based on district court litigation, “all relevant circumstances,” including the merits, are considered in assessing whether to exercise discretion to deny institution of post-grant review. *Fintiv*, Paper 11 at 14. Petitioner argues that the Petition is strong and that “[t]he Board’s technically trained judges are also well suited to assess the patentability grounds presented in this Petition.” Pet. 136. Patent Owner responds that the Petition is “weak and entirely redundant of the prosecution history.” Prelim. Resp. 47. For the reasons discussed below, although Patent Owner raises issues as to the merits, we are not persuaded that those issues weigh in favor of discretionary denial. We view the sixth *Fintiv* factor as neutral.

3. Conclusion

After weighing all of the factors and taking a holistic view of the relevant circumstances of this proceeding, we determine that we should not exercise our discretion to deny institution under § 324(a).

C. Discretion Under 35 U.S.C. § 325(d)

Patent Owner argues that we should exercise discretion to deny institution under 35 U.S.C. § 325(d). *See* Prelim. Resp. 28–32. Petitioner opposes. *See* Pet. 128–30.

1. Legal Framework

Section 325(d) provides that, 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 uses a two-part framework in determining whether to exercise its discretion under § 325(d): (1) determining 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, determining whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *See Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). In applying this framework, we consider several non-exclusive factors, including:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted art was evaluated during examination, including whether the prior art

was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to Section III.C.5, first paragraph). If, after review of factors (a), (b), and (d), we determine that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner demonstrates that the Office erred in a manner material to the patentability of the challenged claims. *Advanced Bionics*, Paper 6 at 10.

2. Summary of the Prosecution History

The '697 patent issued from U.S. Application No. 16/585,790 (“the '790 application”). *See* Ex. 1001, codes (21), (60). In the only office action in the prosecution history, the Examiner allowed certain claims and relied on Schacherer¹⁴ to reject the others. *See* Ex. 1002 at 671–78. The applicant proposed several amendments, including requiring the “pin connector assembly” in claim 1 to extend “through the pressure bulkhead from a first pin connector end to a second pin connector end . . . wherein the first pin connector end extends beyond the first end of the pressure bulkhead and the second pin connector end extends beyond the second end of the pressure bulkhead.” *Id.* at 527; *see also id.* at 534–35 (“Without acquiescing to the rejections, and for the purpose of moving the claims to immediate

¹⁴ US 9,677,363 B2, issued June 13, 2017 (Ex. 1025).

allowance, claim 1 is currently amended to, among other things, recite a pin connector assembly extending through the pressure bulkhead ‘from a first pin connector end to a second pin connector end . . . wherein the first pin connector end extends beyond the first end of the pressure bulkhead and the second pin connector end extends beyond the second end of the pressure bulkhead.’” (alteration in original)). The applicants argued that “Schacherer fails to disclose at least the quoted feature(s).” *Id.* at 535.

The Examiner issued a Notice of Allowability, contingent on the applicants’ acceptance of several amendments proposed by the Examiner, including the addition of a requirement for “a perforation gun system comprising a first outer gun carrier, a shaped charge, and a first detonator, wherein the shaped charge and the first detonator are positioned within the first outer gun carrier, wherein the first outer gun carrier is connected to the first end of the tandem seal adapter” in claim 1. Ex. 1002 at 64–73. In allowing the claims, the Examiner noted that “Burton does not teach or suggest placement of detonator 250 within gun carrier 220 and the known prior art fails to make such a modification obvious.” *Id.* at 71. The applicants accepted the amendments, and the ’697 patent issued. *Id.* at 23, 61–62.

3. *Analysis*

a. Whether the Same or Substantially the Same art or Arguments Were Presented to the Office

As to the first part of the relevant framework, Patent Owner argues that the Petition presents the same or substantially the same art or arguments as previously presented. *See* Prelim. Resp. 29–30. We agree with Patent Owner that three of the four references relied on in the Petition are the same or substantially the same art. As argued by Patent Owner and acknowledged

by Petitioner, Harrigan was listed on an IDS during prosecution. *See* Ex. 1002 at 690; Prelim. Resp. 29 (citing Pet. 128). Further, the record supports Patent Owner’s position that both Goodman and Backhus were also substantially the same art as previously presented. *See* Prelim. Resp. 29–30 (“Petitioners fail to recognize that US2008/0149338 is the pre-grant publication of Goodman, and US8,661,978 is the counterpart U.S. national phase of Backhus.”); Ex. 1002 at 690 (listing “US2008/0149338” as cite No. 15), 703 (listing U.S. Patent No. 8,661,978 B2 as cite No. 4).

We turn now to the SafeJet System. Petitioner relies on the sale and public use of the SafeJet System “at least as early as January 2009” in the Petition. Pet. 5. Specifically, Petitioner discusses the SafeJet Presentation (Ex. 1005), but Petitioner also provides declarations from Mr. Olsen (Ex. 1006) and Mr. Markel (Ex. 1007)—two former employees of Schlumberger (the manufacturer of the SafeJet System)—to explain “the structure and use of the SafeJet System.” Pet. 5. Dr. Wooley also discusses pictures of a “SafeJet Mockup” (shown in Ex. 1023) and drawings of portions of that model (in Ex. 1024). *See, e.g.*, Wooley Decl. ¶ 42. Petitioner relies on Exhibits 1031 and 1032 as evidence of the sale of SafeJet perforating guns. *See* Pet. 5.

Patent Owner argues that “Petitioners’ assertion of the SafeJet System’ as a whole is flawed because it relies upon non-prior art declarations and the 2021 SafeJet Mockup that post-date the ’697 Patent’s effective filing date.” Prelim. Resp. 29. In addition, Patent Owner states that “Petitioner[] cannot and does not argue that their asserted 2021 SafeJet Mockup is substantially different art than the SafeJet Presentation on which they rely for supporting the 2021 SafeJet Mockup.” *Id.*

We do not address here whether Petitioner’s reliance on the SafeJet System is improper. (We do, however, address that issue below. *See infra* § II.H.2.a.2.) For purposes of the first part of the relevant framework, we assume that the inclusion of the SafeJet Presentation on an IDS during prosecution demonstrates that the same or substantially the same art or arguments were presented to the Office, even though none was relied on by the Examiner in a rejection. *See* Ex. 1002 at 697 (listing the SafeJet Presentation as cite No. 4). We turn now to the second part of the framework: “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Advanced Bionics*, Paper 6 at 8–9.

b. Whether Petitioner Sufficiently Demonstrates that the Office Erred

In the second part of the framework, “Petitioner must demonstrate that the Examiner erred in the evaluation of the prior art, for example, by showing that the Examiner misapprehended or overlooked specific teachings in the relevant prior art such that the error by the Office was material to the patentability of the challenged claims.” *Advanced Bionics*, Paper 6 at 21. “An example of a material error may include misapprehending or overlooking specific teachings of the relevant prior art where those teachings impact patentability of the challenged claims.” *Id.* at 8–9 n.9. “For example, if 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 persuasive under factors (e) and (f).” *Id.* at 10–11.

Petitioner argues that the SafeJet Presentation, “as used in this Petition, provides corroboration of certain features that were present in the SafeJet System, but it is not used alone as an invalidating reference—

instead, it is the SafeJet System as a whole that is used to argue for unpatentability of the claims challenged here.” Pet. 128–29. For example, Petitioner states it relies on additional evidence “that was never considered by the Patent Office,” such as the declarations from Mr. Olsen and Mr. Markel, as well as the “[c]omponents of the SafeJet System itself.” Pet. 129.

Patent Owner responds that “[t]he Petition does not expressly assert any material errors by the Office during prosecution of the ’697 Patent.” Prelim. Resp. 30. In addition, Patent Owner contends that the additional evidence highlighted by Petitioner “is unreliable and created well after the ’697 Patent’s filing date by Petitioner SWM.” *Id.* at 31.

We agree with Petitioner for two reasons. First, we view factor (f) under *Becton Dickinson*—which relates to “the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments” (*Becton, Dickinson*, Paper 8 at 17–18)—as supporting Petitioner’s position. Although the SafeJet Presentation was before the Office, the declarations of Mr. Olsen and Mr. Markel, as well as the SafeJet Mockup, are relied on heavily by Petitioner. *See, e.g.*, Pet. 38–61 (citing Exs. 1005, 1006, and 1023 (via the Wooley Declaration) as to claim 1). And Petitioner relies on this additional evidence to address aspects of the claim language that may not be present in the SafeJet Presentation alone. For example, as discussed in the analysis of the “connected to” limitation in element 1.C—the requirement that “the first outer gun carrier is connected to the first end of the tandem seal adapter” (Ex. 1001, 11:27–29)—Petitioner relies on both declarations to show a reasonably likelihood of success as to claim 1. *See infra* § II.H.2.a.1.

Second, in the Reasons for Allowance as to claim 1, the Examiner expressly stated that Burton does not teach the requirement for a detonator within a gun carrier as required by element 1.B (proposed by the Examiner prior to issuance), and that the “known prior art fails to make such a modification obvious.” Ex. 1002 at 71 (“In other words, Burton does not teach or suggest placement of detonator 250 within gun carrier 220 and the known prior art fails to make such a modification obvious.”), 66 (adding the entirety of element 1.B).

In the Preliminary Response, however, Patent Owner does not challenge Petitioner’s position that the SafeJet System satisfies the same requirement—i.e., for a “first detonator . . . positioned within the first outer gun carrier.” *See* Prelim. Resp. 58–72. Instead, Patent Owner challenges whether the SafeJet System discloses the “connected to” limitation in element 1.C. *See id.* For the reasons discussed below (*see infra* § II.H.2.a.1), we determine, at this stage of the proceeding, that Petitioner has made a sufficient showing that the SafeJet System discloses that limitation. Thus, we determine that Petitioner has demonstrated that the Examiner materially erred in overlooking specific teachings in the SafeJet System in a manner that impacts the patentability of the challenged claims.

4. Conclusion

For the reasons above, we find that the same or substantially the same art or arguments were presented to the Office, but we find that Petitioner has shown that the examiner materially erred by overlooking specific teachings in the SafeJet System, as currently presented, that impact the patentability of the challenged claims. Accordingly, we do not exercise our discretion to deny institution under § 325(d).

D. Discretion Under 35 U.S.C. § 324(a) Based on a Prior Petition

1. Legal Framework

The Board has discretion on whether to institute post-grant review. *See SAS Inst.*, 138 S. Ct. at 1356 (explaining that section “314(a) invests the Director with discretion on the question whether to institute review” (emphasis omitted)); *Cuozzo*, 136 S. Ct. at 2140 (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (explaining that under § 314(a), “the PTO is permitted, but never compelled, to institute an IPR proceeding”); *see also* 37 C.F.R. § 42.4(a) (“The Board institutes the trial on behalf of the Director.”).

When determining whether to exercise our discretion under § 314(a), we may consider the following non-exhaustive factors:

1. whether the same petitioner previously filed a petition directed to the same claims of the same patent;
2. whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the second petition or should have known of it;
3. whether at the time of filing of the second petition the petitioner already received the patent owner’s preliminary response to the first petition or received the Board’s decision on whether to institute review in the first petition;
4. the length of time that elapsed between the time the petitioner learned of the prior art asserted in the second petition and the filing of the second petition;
5. whether the petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions directed to the same claims of the same patent;
6. the finite resources of the Board; and

7. the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review.

Gen. Plastic Indus. Co. v. Canon Kabushiki Kaisha, IPR2016-01357, Paper 19 at 15–16 (PTAB Sept. 6, 2017) (precedential). The *General Plastic* factors are not dispositive, but part of a balanced assessment of the relevant circumstances in a proceeding, including the merits. TPG 58. When different petitioners challenge the same patent, the Board considers any relationship between those petitioners when weighing the *General Plastic* factors. See *Valve Corp. v. Elec. Scripting Prods., Inc.*, IPR2019-00062, Paper 11 at 9 (PTAB Apr. 2, 2019) (precedential).

2. Analysis

a. Background of the Prior Petition

On May 10, 2021, G&H Diversified Manufacturing, LP (“G&H”) filed a petition to institute a post-grant review of claims 1–21 of the ’697 patent in PGR2021-00078. See PGR2021-00078, Paper 1. We instituted trial in that proceeding on November 1, 2021, three days after the filing of the Preliminary Response in this proceeding. See PGR2021-00078, Paper 10. G&H is not involved in this proceeding.

b. Factor 1: whether the same petitioner previously filed a petition directed to the same claims of the same patent

Patent Owner argues that the first factor favors denial. See Prelim. Resp. 33–36. Patent Owner quotes from the decision in *Valve*, stating that “application of the *General Plastic* factors is not limited solely to instances when multiple petitions are filed by the same petitioner. Rather, when different petitioners challenge the same patent, we consider any relationship between those petitioners when weighing the *General Plastic* factors.”

Valve, Paper 11 at 2, *quoted at* Prelim. Resp. 33–34. Patent Owner contends that “there are numerous ties between G&H”—the petitioner in PGR2021-00078—“and Petitioners [in this proceeding], including shared counsel, experts, and prior art.” Prelim. Resp. 34. First, Patent Owner states that the same law firm represents Petitioner NexTier in the W.D. Tex. Litigation, petitioner G&H in PGR2021-00078, and G&H in litigation consolidated into No. 6:20-cv-01110 (W.D. Tex.). *See id.* at 34–35 (citing Ex. 2002 ¶ 7). Second, Patent Owner notes that Dr. Wooley, who submitted a declaration for Petitioner in this proceeding also submitted a declaration on behalf of G&H in the same litigation consolidated into No. 6:20-cv-01110 (W.D. Tex.). *See id.* at 35 (citing Ex. 2002 ¶ 7; Ex. 2007). Third, Patent Owner argues that G&H and Petitioner NexTier, through common counsel, filed “invalidity contentions in their respective Western District of Texas cases” that are “identical but for the parties’ names.” *Id.* (citing Ex. 2009; Ex. 2010). According to Patent Owner, those contentions “raise the same SafeJet Presentation, Harrigan, and Goodman references that Petitioner[] raise[s] here” and “also raise the same Rogman, Borgfeld, and Burton references that G&H raises” in PGR2021-00078. *Id.*

We do not agree with Patent Owner that the first factor supports denial. As noted by Petitioner, “[n]either petitioner here is a petitioner in, nor even a real-party-in-interest to, the PGR2021-00078 case.” Prelim. Reply 1. Thus, we look to the alleged relationship between G&H and the two Petitioner entities in this proceeding. *See Valve*, Paper 11 at 2. We agree with Petitioner that the common counsel and common expert witnesses identified by Patent Owner do not necessarily indicate the level of relationship needed to weigh in favor of denial as to the first factor. *See*

Prelim. Reply 1 (“Patent Owner does not point to a single PTAB case suggesting that such ties suffice under *General Plastic* Factor 1 to transform unrelated petitioners into related ones.”). In fact, at least one recent nonprecedential decision highlighted by Petitioner expressly rejected that proposition. *See NetNet Ltd. v. Bright Data Ltd.*, IPR2021-00465, Paper 11 at 10–11 (PTAB Aug. 12, 2021) (“In any event, a party is free to choose their own legal representation and expert, and, accordingly, we decline to consider a party’s choice of a law firm and expert as a factor that favors discretionary denial.”).

Further, as to Patent Owner’s third argument above (regarding allegedly similar invalidity contentions), as noted by Petitioner, the record shows that the invalidity contentions in the Western District of Texas were both filed *after* the filing of the Petition in this proceeding. *See* Prelim. Reply 1–2 (citing Paper 6 (according July 29, 2021, as Petition’s filing date)); Ex. 2009 at 19 (NexTier’s invalidity contentions, filed August 30, 2021); Ex. 2010 at 19 (G&H’s invalidity contentions, filed August 30, 2021). Thus, the inclusion of some references relied on in PGR2021-00078 and PGR2021-00097 in the district court litigations is plausibly due to timing rather than a relationship between the petitioners. For these reasons, we view this factor as weighing against discretionary denial.

c. Factor 2: whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the second petition or should have known of it

Patent Owner argues that this factor favors denial because both Petitioner entities in this proceeding allegedly knew of Harrigan (relied on in this proceeding) at the time of the filing of the petition in PGR2021-00078, as evidenced by letters from both Petitioner entities highlighting that

reference as relevant to the validity of the '697 patent. *See* Prelim. Resp. 36 (citing Ex. 2011 at 2; Ex. 2008¹⁵). Patent Owner argues that

because each reference (or a corresponding publication or counterpart) that Petitioner[] raises here was cited during the '697 Patent's prosecution and appears on the face of the '697 Patent, Petitioner[] should have known of each reference upon even a preliminary review of the '697 Patent at least as early as the November 24, 2020 issue date.

Prelim. Resp. 37.

Petitioner states that it does not dispute “pre-petition knowledge” of Harrigan but does dispute “Patent Owner’s mischaracterizing arguments that the newly-raised SafeJet System art is cumulative to Harrigan.” Prelim. Reply 4–5.

Although the facts appear to indicate that the express language of this factor, as stated in *General Plastic*, may weigh in favor of denial, this factor is applied slightly differently in a situation with different petitioners. For example, in *Valve*, this second factor was found to favor denial because, even though the petitioners were not the same entity, the prior art in the later petition had some commonalities with the prior art in the earlier petition. *See Valve*, Paper 11 at 10–11. Here, the record does not support that such commonalities exist. No common references are relied on in PGR2021-00078 and this proceeding. Moreover, contrary to Patent Owner’s position (Prelim. Resp. 37), Petitioner does not rely merely on the SafeJet Presentation. Instead, Petitioner relies on the sale and public use of the SafeJet System “at least as early as January 2009” in the Petition. Pet. 5.

¹⁵ Although Patent Owner does not cite Exhibit 2008, it appears to be the letter referenced in the second sentence in the section addressing this factor. *See* Prelim. Resp. 36.

Specifically, Petitioner also provides declarations from Mr. Olsen (Ex. 1006) and Mr. Markel (Ex. 1007) to explain “the structure and use of the SafeJet System” (Pet. 5) and Dr. Wooley discusses pictures of a “SafeJet Mockup” (shown in Ex. 1023) and drawings of portions of that model (in Ex. 1024) (*see, e.g.*, Wooley Decl. ¶ 42). Petitioner also relies on Exhibits 1031 and 1032 as evidence of the sale of SafeJet perforating guns. *See* Pet. 5. For these reasons, we view this factor as weighing against discretionary denial.

d. Factor 3: whether at the time of filing of the second petition the petitioner already received the patent owner’s preliminary response to the first petition or received the Board’s decision on whether to institute review in the first petition

We view this factor as weighing against discretionary denial. As acknowledged by Patent Owner (Prelim. Resp. 37), the preliminary response in PGR2021-00078 was filed roughly one month *after* the filing of the Petition in this proceeding. *Compare* PGR2021-00078, Paper 7 (filed Aug. 19, 2021), *with* PGR2021-00097, Paper 3 (filed July 21, 2021).

e. Factor 4: the length of time that elapsed between the time the petitioner learned of the prior art asserted in the second petition and the filing of the second petition & Factor 5: whether the petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions directed to the same claims of the same patent

Patent Owner argues that these factors favor denial. *See* Prelim. Resp. 38–40. Specifically, Patent Owner argues that the relevant date is when the two Petitioner entities were made aware of possible infringement of the ’697 patent via letter from Patent Owner’s counsel: September 11, 2020. *See id.* at 38 (citing *Ericsson Inc. v. Uniloc 2017, LLC*, IPR2019-01550, Paper 8 at 14 (PTAB Mar. 17, 2020)). Patent Owner notes that over ten months passed

from those letters until the filing of the Petition here, whereas in *Valve*, a five-month delay weighed this factor in favor of denial. *See id.* at 38–39.

We do not agree with Patent Owner’s understanding of the relevant law. In *Valve*, the Board discusses a five-month delay between the filing of the first petition and the second petition. *See Valve*, Paper 11 at 14. As noted above, the petition in PGR2021-00078 was filed on May 10, 2021, whereas the Petition in this proceeding was filed just over two months later, on July 21, 2021 (Paper 3). At most, this factor is neutral.

*f. Factor 6: the finite resources of the Board &
Factor 7: the requirement under 35 U.S.C.
§ 316(a)(11) to issue a final determination not later
than 1 year after the date on which the Director
notices institution of review*

These two factors are “efficiency considerations.” *Valve*, Paper 11 at 15. Patent Owner argues that both factors weigh in favor of denial. *See* Prelim. Resp. 40–41. Specifically, Patent Owner contends that the petition in PGR2021-00078 and this Petition “represent duplicative attacks raising the cumulative SafeJet references that place unnecessary burdens on the Board’s (and [Patent Owner’s]) finite resources.” *Id.* at 40.

Petitioner responds that “[b]ecause institution would not waste resources or prevent final written decisions from being completed in a timely manner, factors 6 and 7” weigh against denial. Prelim. Reply 7.

We do not view the situation here as leading to significant efficiency concerns. In contrast to the situation in *Valve*, in which the petitions were separated by roughly five months, here, the separation is just over two months. *See Valve*, Paper 11 at 15. In addition, Petitioner here filed only one petition rather than three as in *Valve*. *See id.* Moreover, as discussed above, contrary to Patent Owner’s position, the record does not support that

significant commonalities exist with the prior art in the earlier petition. At most, this factor is neutral.

3. Conclusion

On balance, the factors in this case weigh against exercising discretion to deny under § 324(a) based on a prior petition.

E. The Level of Ordinary Skill in the Art

The level of ordinary skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain factors, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *Id.*

Petitioner contends, with accompanying declaration testimony, that a person having ordinary skill in the art “would have had at least a bachelor’s degree in mechanical engineering, petroleum engineering, or other similar discipline, and at least three years of experience in the design, development, and use of perforating gun systems.” Pet. 26 (citing Wooley Decl. ¶ 22).

Patent Owner states that Petitioner’s proposed definition “is accurate to the extent it includes all three of these activities: design, develop, **and** use,” but states that the Petitioners’ definition is incorrect to the extent Petitioner “suggests that a field technician who ‘uses’ or merely assembles guns could be” one of ordinary skill in the art. Prelim. Resp. 18. Then,

Patent Owner states that “[t]o properly understand all of the issues related to the ’697 Patent, [one of ordinary skill in the art] should be familiar with prior art methods of designing perforating gun systems and operational procedures for a variety of perforating guns, as well as safety issues related to perforating operations.” *Id.* (citing Rodgers Decl. ¶ 98).

With this discussion, we understand Patent Owner to generally agree with Petitioner’s proposed definition of the level of ordinary skill in the art. Because Petitioner’s proposed definition appears consistent with the record at this stage of the proceeding, including the prior art, and because Patent Owner does not dispute Petitioner’s proposed definition, we adopt the definition of the level of ordinary skill in the art proposed by Petitioner for purposes of this Decision. *See GPAC Inc.*, 57 F.3d at 1579.

F. Claim Construction

In post-grant reviews, the Board interprets claim language using the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.200(b). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1313–14. Although extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be considered in the context of the intrinsic evidence. *See id.* at 1317–19.

1. Overview

Petitioner discusses certain claim terms: (1) “tandem seal adapter” in claims 1 and 8; (2) the “first end” and “second end” of the tandem seal adapter in claim 1; and (3) “bulkhead connector element” in claims 9 and 10. *See* Pet. 26–37. Patent Owner discusses those claim terms and also discusses “connected to” in claim 1. *See* Prelim. Resp. 18–28.

Based on the current record and for purposes of this Decision, we discuss below the terms (1) “connected to,” (2) “first end” and “second end” of the tandem seal adapter, and (3) “bulkhead connector element.” We do not discern a need to construe explicitly any of the other claim language discussed in this section or any other claim terms because doing so would not change the result of the analysis below. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (stating that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

2. “connected to”

Element 1.C requires that “the first outer gun carrier is connected to the first end of the tandem seal adapter.” Ex. 1001, 11:27–29 (the “‘connected to’ limitation”). Petitioner does not expressly address this limitation in the claim construction discussion (*see* Pet. 26–37), but implicitly asserts that “connected to” is satisfied by physical contact. *See, e.g.*, Pet. 47 (discussing this limitation and stating that the disposable bulkheads in the SafeJet System “make physical contact” with the outer gun carriers), 72 (similar discussion as to Goodman), 91 (similar discussion as to Harrigan).

Patent Owner asserts that one of ordinary skill in the art would have understood “connected to” as “joined or coupled in a manner that resists separation and not merely by physical contact.” Prelim. Resp. 19. According to Patent Owner, “[m]ere touching together or physical contact alone would not be sufficient for two components to be ‘connected to’ each other” because “the connection must be secure.” *Id.* (citing Rodgers Decl. ¶¶ 104–105). Patent Owner states that “[t]his connection can be achieved by threading and/or o-rings to provide a firm and secure connection between the tandem seal adapter and the gun carrier, but must be contrasted with a relationship in which two components are merely in physical contact.” *Id.* (citing Rodgers Decl. ¶ 106).

In an effort to further develop this issue, we provide the following comments on Patent Owner’s proposed construction, which we are not persuaded to fully adopt at this stage of the proceeding. Although Patent Owner cites to testimony of its declarant on this issue, Dr. Rodgers does not provide any evidence supporting his understanding of the alleged “industry usage” (Rodgers Decl. ¶ 104) and does not cite to any aspect of the ’697 patent—except the entirety of claim 1—in support of the proposed construction.¹⁶ *See id.* ¶¶ 104–106. For example, Dr. Rodgers states that “[w]hile ‘connected to’ may appear readily understandable, it is important in the context of the ’697 Patent claims to expressly define this term as requiring a secure coupling or joining together” (*id.* ¶ 105), but Dr. Rodgers does not explain what language of claim 1 supports that assertion.

¹⁶ In the claim construction section, Patent Owner also cites to the entirety of claim 1, but no other aspect of the Specification. *See* Prelim. Resp. 19.

At trial, the parties should clarify their positions and develop these issues, including providing additional evidence to support their proposed constructions of “connected to.” Because we determine, as discussed below (*see infra* § II.H.2.a.1), that Petitioner has made a sufficient showing that at least the SafeJet System discloses the “connected to” limitation under Patent Owner’s understanding of the scope of its own proposed construction (as to the configuration of o-rings (*see* Prelim Resp. 19)), we need not expressly construe this term at this stage. *See Nidec*, 868 F.3d at 1017.

3. “*first end*” and “*second end*” of the tandem seal adapter

Claim 1 recites a tandem seal adapter having a “first end” and a “second end” and requires that “the first outer gun carrier is connected to the first end of the tandem seal adapter.” Ex. 1001, 11:21–29. Petitioner argues that “[o]utside of the claims, the ‘697 Patent does not mention the ‘first end’ or the ‘second end’ of the TSA, so there is little intrinsic guidance as to the meaning of ends of the TSA.” Pet. 30. Thus, according to Petitioner, “consulting extrinsic evidence is appropriate.” *Id.* (citing *Phillips*, 415 F.3d at 1313). Petitioner states that “[t]echnical and general dictionaries consistently define the term ‘end’ as meaning ‘the farthest or most extreme part or point of something.’” *Id.* (quoting Ex. 1035 at 3). Petitioner asserts that “[t]hese definitions are also consistent with the patent’s use of the term ‘end’ in reference to components other than the TSA” in that “[t]he [S]pecification describes the ‘end(s)’ of the top connector 14 (first end 242 and second end 244 in Figures 11-15), and the ends of pins 50 (first end 51 a and second end 51 b in Figure 5).” Pet. 31 (citing Wooley Decl. ¶ 57).

Although we agree, at this stage of the proceeding that the term “end” *includes* the farthest or most extreme part or point of something based on,

for example, the intrinsic usage highlighted by Petitioner (Pet. 31), we also agree with Patent Owner that “end” *is not limited to* that meaning. *See* Prelim. Resp. 20 (“While the ‘furthest or most extreme part or point’ may be an example of or part of an ‘end,’ [one of ordinary skill in the art] would appreciate that the term is not limited as such.” (citing Rodgers Decl. ¶ 118)). As an initial matter, and as noted by Patent Owner, Petitioner’s narrow understanding of the term “end” would exclude the embodiment shown in Figure 19, which, unlike Figures 5 and 11–15 raised by Petitioner (Pet. 31), shows the “first end” and “second end” *of the tandem seal adapter*, as opposed to other structures. *See* Prelim. Resp. 21. Although preferred embodiments should not be read into claims as limitations, a construction that excludes a preferred embodiment “is rarely, if ever, correct and would require highly persuasive evidentiary support” to be sustained. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996). For these reasons and for purposes of this Decision only, we are not persuaded to adopt Petitioner’s narrower proposed understanding of “first end” and “second end” of the tandem seal adapter.

4. “*bulkhead connector element*”

Dependent claims 9 and 10 recite the term “bulkhead connector element.” *See* Ex. 1001, 12:29–38. In relevant part, claim 9 requires “a *bulkhead connector element* positioned within the second outer gun carrier, wherein the second pin connector end is in wireless electrical contact with the *bulkhead connector element*” and claim 10 (which depends from claim 9) requires that “the *bulkhead connector element* is in electrical communication with a second detonator positioned within the second outer gun carrier.” *Id.* (emphasis added).

Petitioner argues that “bulkhead connector element” “does not have a generally understood structural meaning in the art” (Pet. 34) and should be construed “pursuant to 35 U.S.C. §112(f)” (Pet. 36). Patent Owner responds that because the phrase “do[es] not recite the terms ‘means,’ ‘step,’ or ‘for,’ there is a presumption that ‘bulkhead connector element’ does not trigger Section 112(f), which Petitioners have failed to rebut.” Prelim. Resp. 24. According to Patent Owner, one of ordinary skill in the art “reading the claim language would understand sufficiently definite structure for the ‘bulkhead connector element,’ which claim 9 requires to be ‘positioned within the second outer gun carrier’ (providing relative size and location information) and be ‘in wireless electrical contact’ with the second pin connector (providing material and shape information).” *Id.*

We first address whether § 112(f) applies, and if so, turn to the construction. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1351–52 (Fed. Cir. 2015) (en banc in relevant part). The Federal Circuit has “stated that the use of the word ‘means’ in a claim element creates a rebuttable presumption that § 112, para. 6 applies” and that “the failure to use the word ‘means’ also creates a rebuttable presumption—this time that § 112, para. 6 does not apply.” *Id.* at 1348. In assessing whether claim language invokes § 112(f), “the essential inquiry is not merely the presence or absence of the word ‘means’ but whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.” *Id.*

Because “bulkhead connector element” does not include the word “means,” we start from the presumption that § 112(f) does *not* apply. This presumption is not “strong” and can be overcome “if the challenger

demonstrates that the claim term fails to ‘recite sufficiently definite structure’ or else recites ‘function without reciting sufficient structure for performing that function.’” *Williamson*, 792 F.3d at 1349 (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)). Petitioner, relying on the testimony of Dr. Wooley, argues that “‘bulkhead connector element’ does not have a generally understood structural meaning in the art” and that one of ordinary skill in the art “would understand this term as referring to anything that performs the function of connecting to the bulkhead.” Pet. 34 (citing Wooley Decl. ¶¶ 58, 61).

The term “element”—as used in the limitation at issue—has been identified as a generic term, similar to “mechanism,” “means,” and “device,” which “typically do not connote sufficiently definite structure.” *Mass. Inst. of Tech. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir. 2006) (“*MIT*”) (listing these four terms as “generic”). With that understanding, we could view the modifying phrase “bulkhead connector” in the limitation at issue as merely reciting a functional description of the generic “element.” When addressing similar claim limitations—i.e., ones reciting a functional descriptor combined with a generic term—the Federal Circuit has often determined that pre-AIA § 112 ¶ 6 or AIA § 112(f) applies. For example, in *Mas-Hamilton Group v. LaGard, Inc.*, 156 F.3d 1206, 1214 (Fed. Cir. 1998), the court held that the district court was correct to apply pre-AIA § 112 ¶ 6 to the recited “lever moving element” because that limitation was “described in terms of its function not its mechanical structure.” As another example, in *MIT*, the court determined that “colorant selection mechanism” did not connote sufficient structure to one of ordinary skill in the art and that § 112 ¶ 6 applied. *See MIT*, 462 F.3d at 1354. Specifically, the court viewed

“mechanism” as not, by itself, connoting sufficient structure and determined that “colorant selection” was not defined in the specification or otherwise understood to a person of ordinary skill in the art. *Id.* at 1353–54.

Despite the presence of “element,” however, we preliminarily determine that Petitioner has not carried its burden, at this stage of the proceeding, to demonstrate that § 112(f) applies. We view the situation here as similar to that in *Lighting World, Inc. v. Birchwood Lighting, Inc.*, in which the court determined that “connector assembly” recited sufficient structure (such that pre-AIA § 112 ¶ 6 did not apply) because the court determined that the record showed that “connector”—rather than “assembly”—was understood to denote structure. 382 F.3d 1354, 1359–63 (Fed. Cir. 2004), *overruled by Williamson*, 792 F.3d at 1349 (“expressly overul[ing] the characterization of th[e] presumption [based on the absence of ‘means’] as ‘strong’”).

In *Lighting World*, as here, the Specification used the phrase at issue as the name for structure shown in the figures. *See Lighting World*, 382 F.3d at 1361–62. For example, here, as noted by Patent Owner, the ’697 patent depicts a “bulkhead connector element 118” as a specific structure, as shown in, for example, Figure 28, reproduced here with that structure shown in red highlighting:

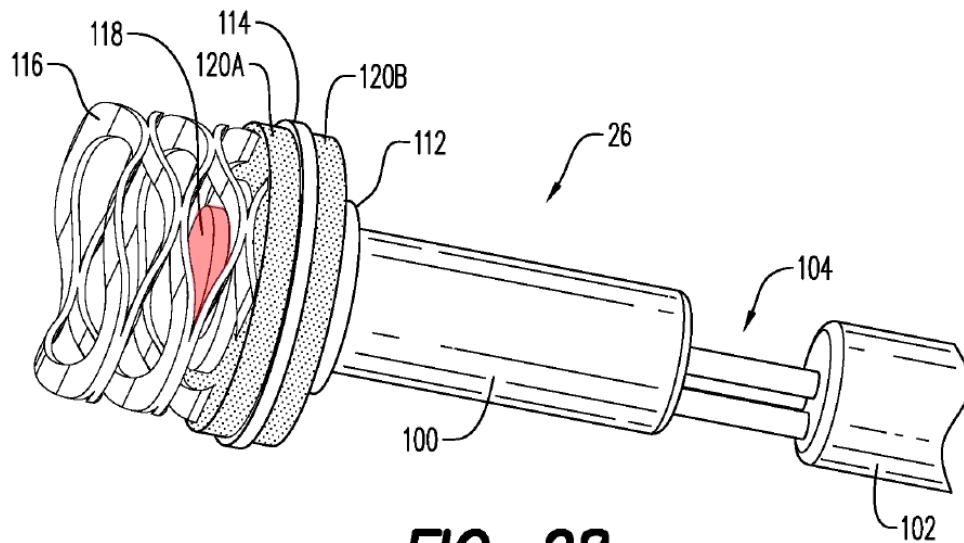


FIG. 28

Ex. 1001, Fig. 28 (highlighting added); *see also* Prelim. Resp 24–25 (discussing how “bulkhead connector element” is used in the ’697 patent). Figure 28 shows a “detailed perspective view” of a detonator. Ex. 1001, 4:49–50. For these reasons, we do not view Petitioner as carrying its burden to show that § 112(f) applies to “bulkhead connector element.”

The fact that the *en banc* court in *Williamson* expressly overruled the *Lighting World* decision based on the application of a “strong” presumption that § 112(f) does not apply in absence of “means,” however, gives us pause as to how the similar facts of *Lighting World* would be assessed under the current law. With that in mind, we continue the discussion assuming that § 112(f) *does* apply to the recited “bulkhead connector element.” If § 112(f) did apply, we would construe that phrase by first identifying the claimed function or functions and then identifying what structure, if any, disclosed in the specification corresponds to the claimed function or functions.

Williamson, 792 F.3d at 1351–52.

As to the first step, Petitioner states that the claimed function is “connecting to the second pin connector end of the bulkhead.” Pet. 36. Patent Owner does not address this issue. *See generally* Prelim. Resp. Assuming that § 112(f) applied, we generally agree with Petitioner’s summary of the function required of the “bulkhead connector element.”

Turning to the second step, Petitioner argues that “the specification fails to disclose *any* sufficient structure that corresponds to the claimed function.” Pet. 36. We do not agree. If § 112(f) applied to “bulkhead connector element,” we determine that the structure disclosed as performing the function above includes at least the structure(s) shown as element 118 in Figures 27, 28, 30, 32, 33, 35A, and 35B, and any “equivalents” thereto. *See* Prelim. Resp. 24 (discussing these figures and Ex. 1001, 8:20–22, 8:37–40).¹⁷ According to Petitioner, “[n]one of the figures . . . show any details of the structure of this element, other than the fact that some portion of it may be circular, as shown in Fig. 30.” Pet. 125. We view the level of detail as adequate, on the current record, to disclose at least one structure corresponding to the “bulkhead connector element.”

G. Effective Filing Date of the Challenged Claims

The Petition provides that, “[i]n the interest of minimizing the issues, Petitioner declines to challenge the priority claims at this time.” Pet. 7 n.1.

¹⁷ Claim construction, in general, is an issue that may be addressed further at trial. Claim construction will be determined at the close of all the evidence and after any hearing. The parties are expected to assert all of their claim construction arguments and evidence in the Petition, Patent Owner’s Response, Petitioner’s Reply, Patent Owner’s Sur-reply, or otherwise during trial, as permitted by our rules.

For purposes of this Decision only, we assume that each of the challenged claims has an effective filing date of July 18, 2013. *See* Ex. 1001, code (30).

H. Asserted Anticipation of Claims 1, 2, 9, and 10 by the SafeJet System

Petitioner asserts that claims 1, 2, 9, and 10 of the '697 patent are anticipated under 35 U.S.C. § 102(a) by the evidence collectively referred to as the SafeJet System. Pet. 8, 38–66. Patent Owner provides arguments specifically addressing this asserted ground. Prelim. Resp. 58–72. We first summarize aspects of the SafeJet System.

1. The SafeJet System

Petitioner states that “[t]he SafeJet System was a perforating gun system from Schlumberger that was on sale and in public use at least as early as January 2009.” Pet. 5. In support, Petitioner relies on (1) the SafeJet Presentation (Ex. 1005); (2) the Declaration of Mr. Olsen (Ex. 1006); and (3) the Declaration of Mr. Markel (Ex. 1007).

The SafeJet Presentation provides information about SafeJet perforating guns allegedly used in a horizontal well off the coast of Norway. *See* Ex. 1005 at 12. A figure from the SafeJet Presentation, showing an exploded view of a perforating gun, is shown below:



Ex. 1005 at 12.

Another image from the SafeJet Presentation is below:



Ex. 1005 at 9. Petitioner describes the image here as showing an outer gun carrier on the top left, and a loading tube and disposable bulkhead on the bottom. Pet. 48. The declarations from Mr. Olsen (Ex. 1006) and Mr. Markel (Ex. 1007)—two former employees of Schlumberger (the manufacturer of the SafeJet System)—explain “the structure and use of the SafeJet System.” Pet. 5. Dr. Wooley discusses pictures of a “SafeJet Mockup” (shown in Ex. 1023) and drawings of portions of that model (in Ex. 1024). *See, e.g.*, Wooley Decl. ¶ 42. Petitioner relies on Exhibits 1031 and 1032 as evidence of the sale of SafeJet perforating guns. *See* Pet. 5.

2. Analysis

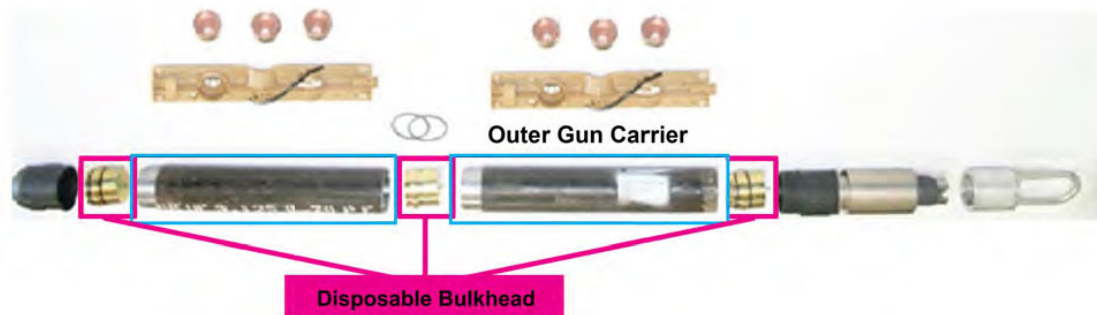
a. Independent Claim 1

For independent claim 1, Petitioner contends that the SafeJet System discloses each limitation. Pet. 38–60. To support its arguments, Petitioner identifies certain aspects of the SafeJet System and explains the significance of each with respect to the corresponding claim limitation. *Id.* Patent Owner argues (1) that the SafeJet System lacks the “connected to” limitation and (2) that Petitioner improperly relies on certain evidence as part of the SafeJet System. *See* Prelim. Resp. 58–71. We have reviewed Petitioner’s contentions with respect to claim 1, and for the reasons below, we determine that the Petition shows more likely than not that Petitioner would prevail in

demonstrating that claim 1 is anticipated by the SafeJet System. Pet. 38–60. We address in turn below each of Patent Owner’s arguments.

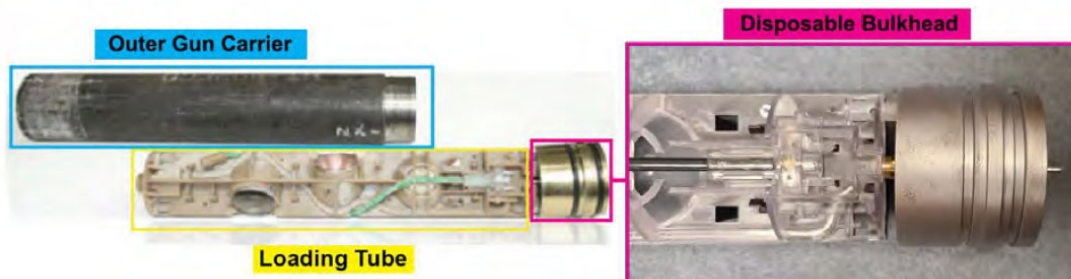
(1) The “Connected to” Limitation

Element 1.C requires that “the first outer gun carrier is connected to the first end of the tandem seal adapter.” Ex. 1001, 11:27–29 (the “connected to” limitation”). As to this limitation, Petitioner provides the following annotated version of an image from page 12 of the SafeJet Presentation (Ex. 1005):



Pet. 47. Petitioner describes the annotated image as showing that “the SafeJet System includes disposable bulkheads (pink) that make physical contact with the outer gun carriers (blue) of adjacent perforating gun systems.” *Id.* (citing Ex. 1005 at 12). Petitioner identifies the “disposable bulkhead” in the SafeJet System as the recited “tandem seal adapter.” *See* Pet. 41.

Petitioner also provides the following annotated version of an image from page 9 of the SafeJet Presentation (Ex. 1005):



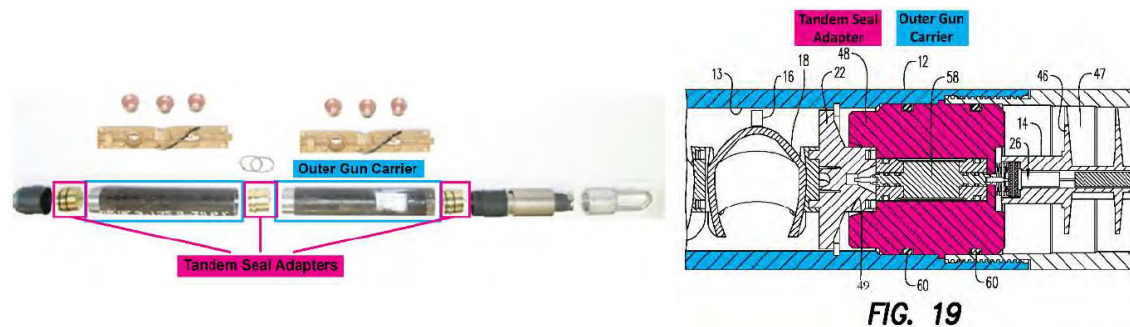
Pet. 48. Petitioner describes the annotated image as showing that “[t]he disposable bulkhead (pink) abuts the loading tube (yellow)” and that “[t]he loading tube is positioned within the outer gun carrier (blue) such that the threads of the outer gun carrier butt up to the bottom lip of the disposable bulkhead.” *Id.* (citing Ex. 1005 at 9; Ex. 1006 ¶ 41; Ex. 1007 ¶¶ 30–31).

Next, Petitioner provides a different annotated version of the same image from page 12 of the SafeJet Presentation shown above:



Pet. 48. Petitioner describes this annotated image as showing that “[t]he first outer gun carrier (blue) screws into the second outer gun carrier (green) over the disposable bulkhead such that the outer gun carriers make physical contact with the disposable bulkhead.” *Id.* (citing Ex. 1005 at 12; Ex. 1006 ¶ 41; Ex. 1007 ¶¶ 29–31).

Petitioner also provides the following side-by-side comparison of the first annotated version of the image from page 12 of the SafeJet Presentation with an annotated version of Figure 19 from the '697 patent:



Pet. 49 (citing Ex. 1005 at 12¹⁸; Ex. 1001, Fig. 19). Petitioner describes these annotated images as showing that “[t]he disposable bulkhead (pink) abuts the carrier (blue) in a similar fashion to how the TSA (pink) abuts the outer gun carrier (blue) in the ’697 Patent.” Pet. 48 (citing Wooley Decl. ¶¶ 72–73). According to Petitioner, “if the ’697 patent provides written-description support for the first end of the TSA being connected to the outer gun carrier by way of physical contact alone, then the SafeJet System discloses this exact same feature.” Pet. 49.

Patent Owner responds that the SafeJet System lacks the “connected to” limitation. *See* Prelim. Resp. 68–71. Specifically, Patent Owner contends that “none of Petitioner[’s] SafeJet System evidence shows or describes a fully assembled SafeJet System perforating gun including an outer gun carrier or the configuration of components within” and that “the SafeJet System evidence shows and describes that the SafeJet System bulkhead is connected to the loading tube, not an outer gun carrier.” *Id.* at 68. Patent Owner asserts that Petitioner “attempt[s] to conflate ‘physical contact’ and ‘connected to.’” *Id.* at 70.

Although we agree with Patent Owner that the images from the SafeJet Presentation do not expressly show the disposable bulkhead in the SafeJet System assembled with the outer gun carrier, Patent Owner is incorrect that “[t]he Petition cites only the SafeJet Presentation to support that the SafeJet System discloses this claimed feature.” Prelim. Resp. 69–70. For the reasons below, considering all the evidence presented—including the declaration testimony of Mr. Olsen and Mr. Markel—we

¹⁸ Petitioner mistakenly cites to page 10 of the SafeJet Presentation as including this image. Pet. 49.

determine, at this stage of the proceeding, that Petitioner has made a sufficient showing that the SafeJet System discloses the “connected to” limitation.

As discussed above (*see supra* § II.F.2), Patent Owner states that a connection falling within the scope of the “connected to” limitation “can be achieved *by threading and/or o-rings* to provide a firm and secure connection between the tandem seal adapter and the gun carrier” Prelim. Resp. 19 (citing Rodgers Decl. ¶ 106) (emphasis added). Patent Owner’s declarant, Dr. Rodgers, agrees. *See* Rodgers Decl. ¶ 106. And Petitioner relies on the presence of o-rings between the disposable bulkhead in the SafeJet System (i.e., the identified “tandem seal adapter”) and the inner surface of the gun carrier when the SafeJet System is assembled. *See* Pet. 47–49 (citing Ex. 1005 at 9, 12; Wooley Decl. ¶¶ 72–73; Ex. 1006 ¶ 41; Ex. 1007 ¶¶ 29–31). For example, in the cited paragraph of his testimony, Mr. Olsen provides the following image of the disposable bulkhead from the SafeJet Presentation:



Ex. 1006 ¶ 41 (reproducing Ex. 1005 at 14). Mr. Olsen describes the depicted “disposable bulkhead” as “a component that is used to electrically connect the perforating guns of the SafeJet System.” *Id.* Mr. Olsen also describes the disposable bulkhead as including o-rings (shown as two black bands):

The outer surface of the disposable bulkhead includes a raised annular shoulder with o-rings located in grooves on either side. The o-rings seal against the inner surface of the outer gun carrier of the perforation guns connected on either side of the disposable bulkhead. The shoulder allows for the disposable bulkhead to be positioned between two connected perforating guns.

Ex. 1006 ¶ 41. The cited testimony of Mr. Markel supports Mr. Olsen’s understanding, providing that, when the SafeJet System is assembled, the disposable bulkheads (such as shown above) “are inserted into each end of the carrier to facilitate connections between perforating guns and isolate the loading tube of each perforating gun from wellbore pressure and pressure from downhole perforating operations.” Ex. 1007 ¶ 30.

Notably, both Mr. Olsen and Mr. Markel highlight how, in the SafeJet System, the o-rings would provide a seal between the inner surface of the gun carrier and the outer surface of the disposable bulkhead. *See* Ex. 1007 ¶ 30 (“The bulkhead has two o-rings to seal against the inner diameter of the carrier, isolating the interior of the carrier from the wellbore and isolating one side of the bulkhead from the other side of the bulkhead.”); Ex. 1006 ¶ 41 (“The o-rings seal against the inner surface of the outer gun carrier of the perforation guns connected on either side of the disposable bulkhead.”). And this functionality—provided by an o-ring—is the same stated by Patent Owner as falling within the scope of the “connected to” limitation. *See* Prelim. Resp. 19 (“This ‘connection’ is described in the ’697 Patent as being

sufficiently secure as to provide a seal between the first gun carrier and the second end of the tandem seal adapter. This connection can be achieved by threading and/or o-rings to provide a firm and secure connection between the tandem seal adapter and the gun carrier . . .”). For these reasons, at this stage of the proceeding and on the current record, we determine that Petitioner has made a sufficient showing that the SafeJet System discloses the “connected to” limitation.

*(2) Arguments Challenging the Adequacy of the
Evidence as to the SafeJet System*

Patent Owner presents two arguments challenging the adequacy of Petitioner’s evidence as to the SafeJet System. *See* Prelim. Resp. 58–68. First, Patent Owner asserts that “[t]he SafeJet Presentation, which is the only documentary evidence that arguably shows features of the SafeJet System before the ’697 Patent priority date, fails to disclose, e.g., the detonator that Messrs. Olsen and Markel state was present in the SafeJet System” and “the alleged SafeJet System feedthru (which Petitioners apply against the claimed pressure bulkhead) possessed by Mr. Olsen (and the configuration of the feedthru within the bulkhead, as in the 2021 bulkhead mockup).” *Id.* at 59 (citing Ex. 1006 ¶¶ 36, 44; Ex. 1007 ¶¶ 20, 24). According to Patent Owner, the declarations “do not include any corroborating information for the alleged feedthru—e.g., when and by whom it was manufactured and obtained, where and how it was maintained, etc.—and the presence of a detonator in the SafeJet System is not evidenced by anything beyond the consultants’ descriptions.” *Id.*

This argument does not identify a deficiency in Petitioner’s positions at this stage of the proceeding. As to the “detonator” in element 1.B, Patent Owner appears correct that Petitioner relies primarily on testimony from Mr.

Olsen and Mr. Markel. *See* Pet. 45–47. We do not see a deficiency in Petitioner’s position merely due to the reliance on declaration testimony as to the presence of a “detonator” on the SafeJet Board, which Patent Owner does not dispute was present in the SafeJet System. We note also that Dr. Wooley—Petitioner’s expert—shares this understanding of the SafeJet System, as discussed in the same section of the Petition. *See* Wooley Decl. ¶ 71, *cited at* Pet. 46–47.

As to the “pressure bulkhead” recited in element 1.D, Patent Owner again appears correct that Petitioner relies on testimony from Mr. Olsen and Mr. Markel. *See* Pet. 49–51. More specifically though, as the “pressure bulkhead,” Petitioner provides photos of a feedthru connector that was “an actual production piece used in the original SafeJet System” and that was in Mr. Olsen’s possession when contacted by Petitioner SWM. Ex. 1006 ¶¶ 43–44; Ex. 1023 at 8–9 (including photographs of the feedthru). According to Petitioner, this feedthru connector exemplifies the structure in the SafeJet System relied on as the “pressure bulkhead.” *See* Pet. 49–51. Dr. Wooley discusses the “pressure bulkhead” similarly. *See* Wooley Decl. ¶ 74, *cited at* Pet. 50.

As the second of Patent Owner’s two arguments, in a section with the heading “Overview of Petitioners’ SafeJet Evidence,” Patent Owner highlights alleged inadequacies in two parts of the evidence relied on as to the SafeJet System: (1) the SafeJet Presentation (Ex. 1005) and (2) the SafeJet Mockup (shown in Ex. 1023). *See* Prelim. Resp. 60–68. For example, Patent Owner contends that the SafeJet Presentation “does not include any image(s) or description of the assembled SafeJet system, the method of assembling the system, or the configuration of all components in

the assembled system.” *Id.* at 62. As to the SafeJet Mockup, Patent Owner argues that Petitioner has “not specifically identified when or by whom those components were made or obtained, or where or how they have been maintained” and argues that “the internal wiring of the loading tube is not clear or sufficiently identified.” *Id.* at 63 (citing Ex. 1006 ¶¶ 40, 44; Rodgers Decl. ¶ 69).

These arguments do not identify a deficiency in Petitioner’s positions at this stage of the proceeding. As discussed above, Petitioner does not rely *solely* on the SafeJet Presentation or the SafeJet Mockup in the relevant grounds. Instead, Petitioner relies on the sale and public use of the SafeJet System “at least as early as January 2009,” and Petitioner relies on various evidence—including, but not limited to, the SafeJet Presentation and the SafeJet Mockup—as evidence of the structure of the SafeJet System in that time period. *See* Pet. 5–7 (discussing the SafeJet System). Thus, any alleged deficiency in one aspect of the evidence relied on does not necessarily show a deficiency in the relevant grounds overall.

(3) The Remaining Limitations

Patent Owner does not offer any arguments addressing the remaining limitations of claim 1. *See* Prelim. Resp. 58–71. We have reviewed Petitioner’s contentions with respect to the remaining limitations, and determine that the Petition provides a sufficient showing, at this stage of the proceeding, that the SafeJet System satisfies each limitation. *See* Pet. 38–60.

(4) Conclusion

For the reasons above, we determine, based on the current record, that the Petition shows more likely than not that Petitioner would prevail in demonstrating that claim 1 is anticipated by the SafeJet System.

b. Claim 2

For dependent claim 2 (which depends from claim 1), Petitioner contends that the SafeJet System discloses each limitation. Pet. 61–62. Patent Owner does not present any arguments specifically addressing claim 2. We include claim 2 in the context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

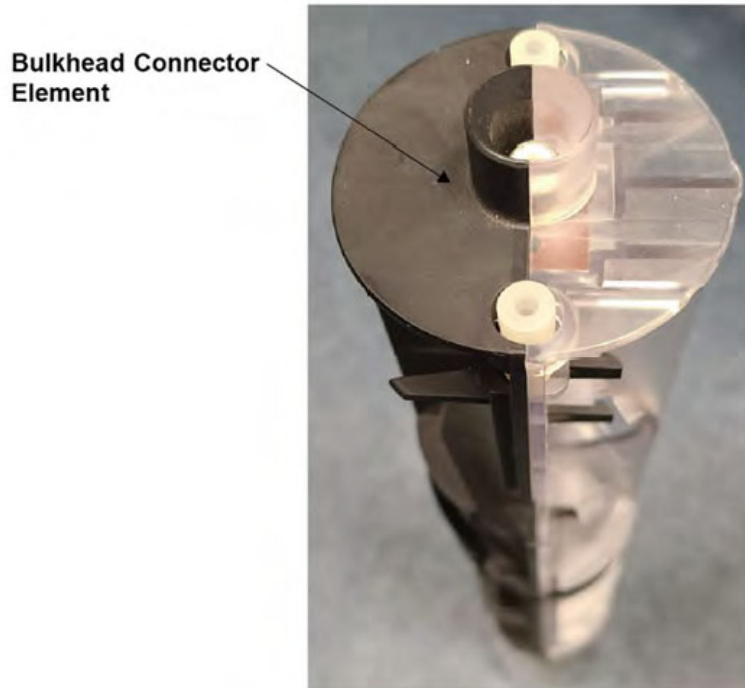
c. Claim 9

For dependent claim 9, Petitioner contends that the SafeJet System discloses each limitation. Pet. 62–64. Specifically, as to the requirement for “a second outer gun carrier connected to the second end of the tandem seal adapter,” Petitioner provides the following annotated version of an image from page 12 of the SafeJet Presentation (Ex. 1005):



Pet. 63. Petitioner describes this annotated image as showing “a second gun connected to the second end of the TSA.” *Id.* Petitioner states that “[t]he SafeJet gun system was designed to connect multiple guns together in one gun string” and that “[t]he loading tube includes a piece at the end.” *Id.*

Petitioner then provides the following image from the Wooley Declaration:



Pet. 63 (citing Wooley Decl. ¶ 87). The image shows a structure with a portion labeled as “Bulkhead Connector Element.” *Id.* Petitioner states that “[t]he piece receives the pin of the feedthru so that the second outer gun carrier is connected to the second end of the TSA.” *Id.* (citing Ex. 1007 ¶ 41).

Patent Owner argues that “[n]one of Petitioner[’s] SafeJet System evidence discloses a second outer gun carrier connected to the second end of the tandem seal adapter, at least because none of the SafeJet System evidence shows or describes two outer gun carriers connected together or to respective first and second ends of a tandem seal adapter.” Prelim. Resp. 72.

At this stage of the proceeding, we question the adequacy of Petitioner’s evidence as to the highlighted aspect of claim 9, as currently understood. As to Petitioner’s reliance on the exploded assembly shown in

the SafeJet Presentation, we agree with Patent Owner that that image does not actually depict “a second outer gun carrier connected to the second end of the tandem seal adapter.” *See* Prelim. Resp. 72. Moreover, in contrast to Petitioner’s presentation as to the “connected to” limitation in claim 1, Petitioner has not adequately explained why the limitation at issue in claim 9 would have reasonably been understood as satisfied by the evidence presented.

We turn now to Petitioner’s discussion as to the second image in this section (from the Wooley Declaration). Although Petitioner persuasively explains, at this stage of the proceeding, why the SafeJet System discloses “a bulkhead connector element positioned within the second outer gun carrier, wherein the second pin connector end is in wireless electrical contact with the bulkhead connector element” as recited in the rest of claim 9, Petitioner has not explained why that “wireless electrical contact” would *also* satisfy the requirement in claim 9 for “a second outer gun carrier connected to the second end of the tandem seal adapter.” Indeed, claim 9 expressly recites that the “bulkhead connector element” is *within* the “second outer gun carrier” (Ex. 1001, 12:31–33), not that that the “bulkhead connector element” is part of the “second outer gun carrier.” The parties should develop these issues at trial.

Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include claim 9 in the context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

d. Claim 10

For dependent claim 10 (which depends from claim 9), Petitioner contends that the SafeJet System discloses each limitation. Pet. 64–66. Patent Owner does not present any arguments specifically addressing claim 10. We include claim 10 in the context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

I. Asserted Anticipation of Claims 1, 2, 9, and 10 by Goodman

Petitioner asserts that claims 1, 2, 9, and 10 of the '697 patent are anticipated under 35 U.S.C. § 102(a) by Goodman. Pet. 8, 66–88. Patent Owner provides arguments specifically addressing this asserted ground. Prelim. Resp. 48–58. We first summarize aspects of Goodman.

1. Goodman

Goodman discloses a pre-assembled perforating gun and a method for pre-assembling a loading tube. *See* Ex. 1026, code (57).

Figure 2 of Goodman is reproduced below:

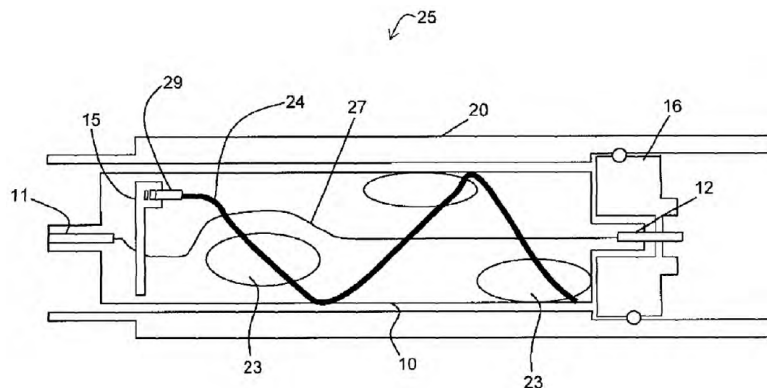


FIG. 2

Figure 2 depicts “a pictorial diagram in partial cross-section of a perforating gun in which a loading tube in accordance with the present

invention is installed.” Ex. 1026, 2:9–11. Figure 2 shows “pressure bulkhead 16 . . . connected to one end of loading tube 10 and the pressure bulkhead 16 engages connector 12.” *Id.* at 3:48–50. Goodman discloses that “pressure bulkhead 16 between perforating guns in the string provides a path for electrical continuity between the earth’s surface and the guns in the string and isolates each loading tube assembly from fluids (e.g., wellbore fluids) transported by adjacent loading tube assemblies.” *Id.* at 3:50–55. Figure 2 also shows detonating cord 24, shaped charges 23, RF-safe initiator 15, and connectors 11 and 12 with wiring 27 between. *See id.* at 3:34–47.

2. Analysis

a. Independent Claim 1

For independent claim 1, Petitioner contends that Goodman discloses each limitation. Pet. 8, 67–83. Patent Owner (1) argues that Petitioner improperly relies on the same structure in Goodman as both the “pressure bulkhead” and the “pin connector assembly” and (2) argues that Goodman does not disclose “a pin connector assembly extending through the pressure bulkhead from a first pin connector end to a second pin connector end.” *See* Prelim. Resp. 54–58. We address each below.

(1) Identifying the Same Structure as the “Pressure Bulkhead” and the “Pin Connector Assembly”

Element 1.D recites “a pressure bulkhead having an outer surface, a first end and a second end, the outer surface of the pressure bulkhead is sealingly received in the bore of the tandem seal adapter.” Ex. 1001, 11:30–33. To address this language, Petitioner provides the following annotated version of a portion of Figure 2 of Goodman:

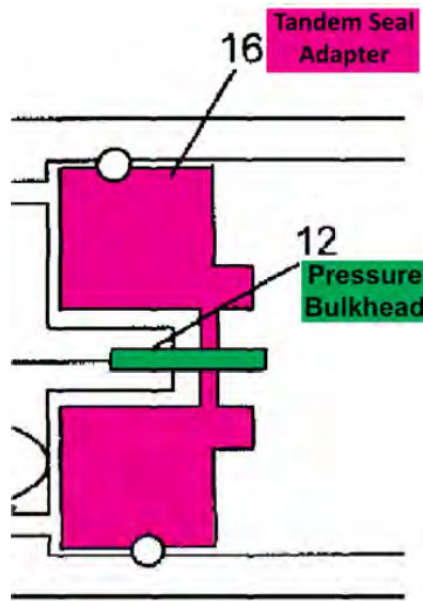
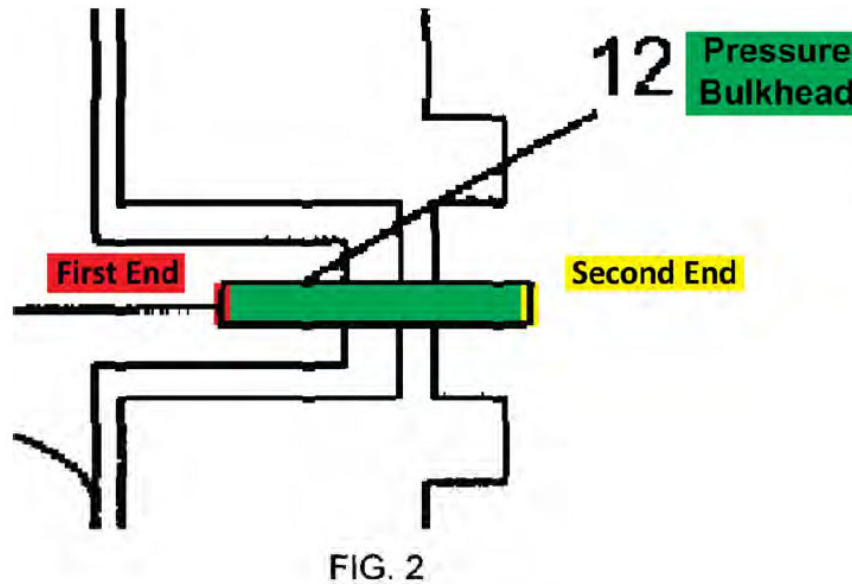


FIG. 2

Pet. 74. Prior to annotation, the full Figure 2 depicts “a pictorial diagram in partial cross-section of a perforating gun in which a loading tube in accordance with the present invention is installed.” Ex. 1026, 2:9–11. In the annotated version of a portion of Figure 2 of Goodman here, Petitioner added (1) a text box identifying element 16 as a “Tandem Seal Adapter,” highlighted in pink and (2) a text box identifying element 12 as a “Pressure Bulkhead,” highlighted in green. Pet. 74.

Petitioner also provides the following annotated version of a portion of Figure 2 of Goodman:



Pet. 76. Prior to annotation, the full Figure 2 depicts “a pictorial diagram in partial cross-section of a perforating gun in which a loading tube in accordance with the present invention is installed.” Ex. 1026, 2:9–11. In the annotated version of a portion of Figure 2 of Goodman here, Petitioner added (1) a text box identifying element 12 as a “Pressure Bulkhead,” highlighted in green, (2) a text box identifying a “First End” of the “Pressure Bulkhead,” highlighted in red, and (3) a text box identifying a “Second End” of the “Pressure Bulkhead,” highlighted in yellow. Pet. 76.

Element 1.E recites “the pressure bulkhead also having a pin connector assembly extending through the pressure bulkhead from a first pin connector end to a second pin connector end.” Ex. 1001, 11:33–36. In support, Petitioner again reproduces the same annotated Figure 2 of Goodman shown immediately above. *Compare* Pet. 75 (addressing element 1.D), *with* Pet. 76 (addressing element 1.E). In the discussion of element

1.E, Petitioner now identifies the green structure as a “connector,” stating that “[t]he connector (green) . . . extends through the pressure bulkhead from a first end (red) to a second end (yellow).” Pet. 76–77.

Patent Owner argues that the Petition improperly relies on the same structure for both the “pressure bulkhead” and the “pin connector assembly.” See Prelim. Resp. 54–57. We agree with Patent Owner’s characterization of Petitioner’s arguments, at least as understood at this stage of the proceeding. For example, although Petitioner refers to the green structures in the annotated figures above as “Pressure Bulkhead,” in the text addressing element 1.D—which does not recite the word “connector”—Petitioner refers to the green structure as a “connector.” See Pet. 74 (addressing the first annotated figure above: “This is shown below, which depicts the connector (green) engaged within the pressure bulkhead (pink).”) ¹⁹, 75 (“The connector has an outer surface (green), a first end (red), and a second end (yellow).”). This is not, however, *per se* improper, as implied by Patent Owner. Whether it is improper to identify one structural element in prior art as allegedly satisfying two different claim elements turns on whether the claim requires the separateness of the two claim elements. Compare *HTC Corp. v. Cellular Commc’ns Equip., LLC*, 701 F. App’x 978, 982 (Fed. Cir. 2017) (noting that “[t]he separate naming of two structures in the claim strongly implies that the named entities are not one and the same structure,” and that it is improper to rely on the same structure of a prior art reference as

¹⁹ With this statement, Petitioner seems to identify element 16 in Goodman as the “pressure bulkhead” (as that structure is highlighted in pink), however, the text in the same annotated figure identifies element 12 as a “Pressure Bulkhead.”

teaching two (or more) separate claim elements) & *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (“Where a claim lists elements separately, ‘the clear implication of the claim language’ is that those elements are ‘distinct component[s]’ of the patented invention.” (alteration in original) (quoting *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004))), *with Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1304 (Fed. Cir. 2011) (“Thus, the specifications and the claims indicate that the ‘retainer member’ and the ‘needle holder’ need not be two separate pieces.”).

At this stage of the proceeding, we view the record as mixed on whether the “pressure bulkhead” and “pin connector assembly” must be separate structures. Claim 1 indicates that the “pin connector assembly” is a subcomponent of the “pressure bulkhead,” reciting, in element 1.E, “the pressure bulkhead *also having* a pin connector assembly.” Ex. 1001, 11:33–34. The rest of element 1.E does not contradict that understanding, requiring that the “pin connector assembly extend[s] through the pressure bulkhead.” *Id.* at 11:34–35.

The Specification provides evidence both supporting and refuting the separateness of these features. For example, Figure 32 seems to depict pressure bulkhead 124 as a *separate* structure from the pin connector assembly within, using separate hatching. *See* Ex. 1001, Fig. 32; 37 C.F.R. § 1.84(h)(3) (“The hatching of juxtaposed different elements must be angled in a different way.”). But the written description of the Figure seems to indicate, in two consecutive sentences, both (1) that the “pressure bulkhead” includes the “pin connector assembly” and (2) that “pin connector assembly” includes the “pressure bulkhead.” *See* Ex. 1001, 8:34–38 (“The bulkhead

124 includes spring connector end interfaces comprising contact pins 126A, 126B, linked to coil springs 128A, 128B. This dual spring pin connector assembly including the bulkhead 124 and coil springs 128A, 128B is positioned within the tandem seal adapter 48 . . .”).

Turning to the applied art, at this stage of the proceeding, the record supports Patent Owner’s view that Goodman does not describe relied-upon connector 12 as more than one component, such that, for example, an identified “pin connector assembly” would be understood as “extending through” an identified “pressure bulkhead.” *See* Prelim. Resp. 54 (“Further, Goodman does not provide *any* drawing or description of *any* aspect of this unnumbered structure which appears simply as a rectangle in Goodman’s figures. *See* FIGS. 2–5.”); *see also* Ex. 1026, 3:31–32, 3:44–50 (discussing connector 12). The parties should develop these issues further at trial.

(2) Lacking Element 1E

In addition to the argument above relating to both elements 1.D and 1.E together, Patent Owner also argues that Goodman does not disclose element 1.E, which, again, recites “the pressure bulkhead also having a pin connector assembly extending through the pressure bulkhead from a first pin connector end to a second pin connector end.” Ex. 1001, 11:33–36; *see* Prelim. Resp. 57–58. As noted above, in support of its position, Petitioner reproduces the annotated Figure 2 of Goodman shown immediately above. *See* Pet. 76. According to Petitioner, “[t]he connector (green) . . . extends through the pressure bulkhead from a first end (red) to a second end (yellow).” Pet. 76–77.

Patent Owner asserts that “Petitioner[] do[es] not argue that Goodman shows the claimed pin connector assembly extending from a first pin

connector end to a second pin connector end” and that, “[i]nstead, Petitioner[] merely describe[s] how *they* have annotated the unnumbered, undescribed rectangle in FIG. 2 of Goodman—as shown above—without regard to the claim language or Goodman’s teachings.” Prelim. Resp. 57 (citing Rodgers Decl. ¶ 139). According to Patent Owner, “[t]he continuous rectangle between the loading tube (10) and bulkhead (16) in Fig. 2 of Goodman does not show how the connectors (12, unnumbered) are connected, and Goodman fails to provide any details regarding the connectors.” *Id.* Patent Owner adds that Goodman fails to disclose element 1.E because “(1) Goodman does not describe the single rectangle in Fig. 2; (2) the connector (12) in Fig. 2 is on the loading tube; (3) a pressure bulkhead, as claimed, is not shown; and (4) the connection between the unnumbered connector and loading tube is inconsistently shown in Goodman.” *Id.* at 57–58 (citing Rodgers Decl. ¶ 140).

At this stage of the proceeding, the record supports Patent Owner’s argument. As an initial matter, for the reasons discussed in the prior section, the parties should address whether the claim language at issue requires the separateness of the “pressure bulkhead” and the “pin connector assembly.” Further, it is unclear whether Petitioner relies on the entirety of element 12 in Goodman as the “pin connector assembly” and also relies on the entirety of element 12 in Goodman as the “pressure bulkhead” (as it appears (Pet. 74–77)). If so, it is unclear how the identified “pin connector assembly” could “extend[] through” *itself*. The parties should develop these issues further at trial.

(3) Conclusion

Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include claim 1 in the context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

b. Claims 2, 9, and 10

For dependent claims 2, 9, and 10 (all of which depend, at least indirectly, from claim 1), Petitioner contends that Goodman discloses each limitation. Pet. 84–88. Patent Owner does not present any arguments specifically addressing claims 2, 9, and 10. We include claims 2, 9, and 10 in the context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

J. Asserted Anticipation of Claims 1, 2, and 8–10 by Harrigan

Petitioner asserts that claims 1, 2, and 8–10 of the ’697 patent are anticipated under 35 U.S.C. § 102(a)(2) by Harrigan. Pet. 8, 88–106. Patent Owner provides arguments specifically addressing this asserted ground. Prelim. Resp. 72–89. We first summarize aspects of Harrigan.

1. Harrigan

Harrigan discloses a modular perforating gun. Ex. 1008, codes (54), (57). Petitioner asserts that Harrigan is prior art to the ’697 patent under 35 U.S.C. § 102(a)(2) via 35 U.S.C. § 102(d)(2) because it has an effective filing date of May 3, 2013, the filing date of U.S. Provisional Patent Application No. 61/819,196 (Ex. 1011, the “Harrigan Provisional”). *See* Pet. 9–14.

Figure 1A of Harrigan is reproduced below:

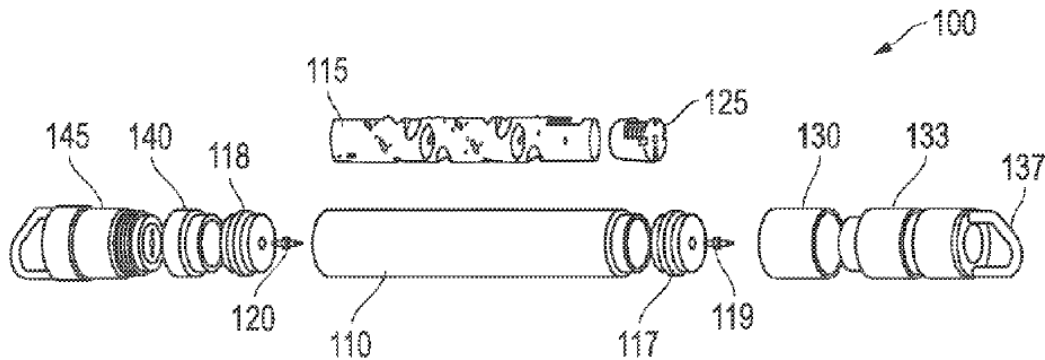


FIG. 1A

Figure 1A is “an exploded perspective view of an embodiment of a cohesively enhanced modular perforating gun.” Ex. 1008 ¶ 11. Modular perforating gun 100 includes “a carrier 110 that is configured for accommodating a loading tube 115,” which is, in turn, “configured to accommodate a host of shaped charges [(unnumbered)] for a perforating application in a well 180.” *Id.* ¶ 22. Loading tube 115 is also configured to accommodate an initiator assembly module 125, which triggers the charges for perforating the surrounding formation. *Id.* ¶¶ 10, 22, 23. Harrigan discloses that “carrier 110 and loading tube 115 may be sealed off at either end by bulkheads 117, 118” such that “explosive shaped charges may be safely isolated within the downhole environment until the time of the perforating application.” *Id.* ¶ 24. In addition, “each bulkhead 117, 118 may have a modular feedthru 119, 120 to ultimately provide electrically connectivity between internal components such as the initiator assembly module 125 and communications from surface.” *Id.*

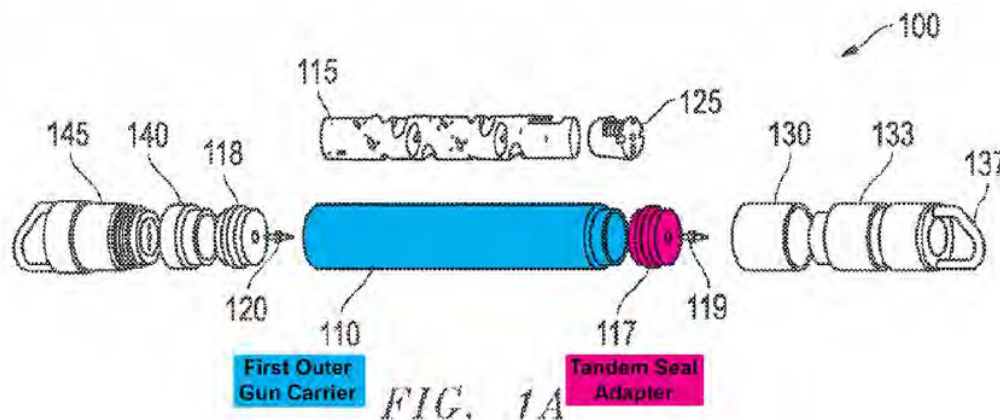
2. Analysis

a. Independent Claim 1

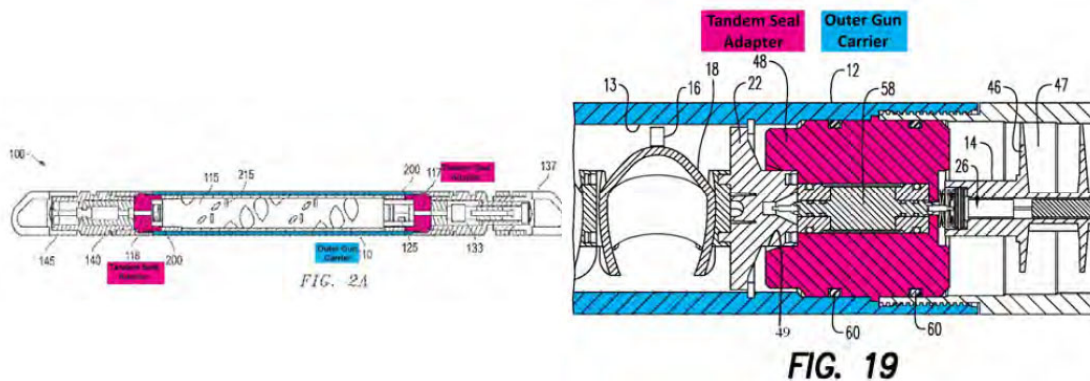
For independent claim 1, Petitioner contends that Harrigan discloses each limitation. Pet. 88–101. Patent Owner argues that Harrigan lacks the “connected to” limitation. *See* Prelim. Resp. 72–86.

(1) The “Connected to” Limitation

The “connected to” limitation in element 1.C requires that “the first outer gun carrier is connected to the first end of the tandem seal adapter.” Ex. 1001, 11:27–29. As to this limitation, Petitioner provides the following annotated version of Figure 1A of Harrigan:



Petitioner also provides the following side-by-side comparison of an annotated version of Figure 2A of Harrigan with an annotated version of Figure 19 of the '697 patent:



Pet. 92. Prior to annotation, Figure 2A of Harrigan is “a side cross-sectional view of the perforating gun showing chamfered centralizing rings ensuring cohesive fit between a loading tube and carrier” (Ex. 1008 ¶ 13) and Figure 19 of the '697 patent is “an enlarged detailed side cut view of a portion of the perforation gun system including a bulkhead and stackable charge holders shown in FIG. 1” (Ex. 1001, 4:30–32). In the annotated version of Figure 2A of Harrigan, Petitioner added (1) a text box and blue highlighting identifying element 110 as an “Outer Gun Carrier” and (2) a text box and pink highlighting identifying elements 117/118 as “Tandem Seal Adapter.” Pet. 92. In the annotated version of Figure 19 of the '697 patent, Petitioner added (1) a text box and blue highlighting identifying element 12 as an “Outer Gun Carrier” and (2) a text box and pink highlighting identifying element 48 as a “Tandem Seal Adapter.” *Id.* As to this pair of images, Petitioner states that “[t]he pressure bulkhead 117, 118 (pink) is connected to carrier 110 (blue) in a similar fashion to how the TSA 48 (pink) is connected to the outer gun carrier 12 (blue) in the '697 Patent.” Pet. 91–92 (citing Wooley Decl. ¶¶ 116–117).

Patent Owner argues that Harrigan and the Harrigan Provisional do not disclose the “connected to” limitation. *See* Prelim. Resp. 84–86. Specifically, Patent Owner first asserts that Petitioner’s position as to this limitation “stems from the baseless assertion that a tandem seal adapter in physical contact with an outer gun carrier is ‘connected to’ the outer gun carrier” even though, according to Patent Owner, “[t]his is not a reasonable reading of the ’697 Patent or the claimed feature, which requires more than mere physical contact.” *Id.* at 84 (citing Rodgers Decl. ¶ 155).

As discussed above (*see supra* § II.F.2), we do not expressly construe the “connected to” limitation at this stage. Even if we were to construe that limitation under Petitioner’s construction (i.e., as in physical contact with), we agree with Patent Owner that Petitioner has not adequately demonstrated that the Harrigan Provisional—on which Petitioner relies for the necessary effective filing date to antedate the challenged claims (*see* Pet. 9–14)—discloses the “connected to” limitation. *See* Prelim. Resp. 84–85 (discussing how “the Harrigan Provisional does not disclose ‘the first outer gun carrier is connected to the first end of the tandem seal adapter,’ in any event”).

Here, as generally acknowledged by Petitioner, Harrigan is entitled to claim the benefit of an earlier filing date under 35 U.S.C. § 120 based on the Harrigan Provisional. *See* MPEP § 2154.01(b) (“Determining When Subject Matter Was Effectively Filed Under AIA 35 U.S.C. [§] 102(d)”). In that situation, section 102(d)(2) provides that “[f]or purposes of determining whether a[n] . . . application for patent,” such as the application underlying Harrigan, “is prior art to a claimed invention under subsection (a)(2), such . . . application shall be considered to have been effectively filed, with respect to *any subject matter described in the . . . application . . . as of the*

filing date of the earliest such application *that describes the subject matter.*” 35 U.S.C. § 102(d)(2) (emphasis added). Thus, Patent Owner accurately states that the disclosures in Harrigan are “only effective as prior art for subject matter supported by the Harrigan Provisional.” Prelim. Resp. 73 (citing Rodgers Decl. ¶¶ 72–78).

In the discussion of element 1.C, as noted by Patent Owner, Petitioner does not cite to or discuss the Harrigan Provisional *at all*. See Pet. 91–92; see Prelim. Resp. 74 (“In fact, Petitioners and their expert, Dr. Wooley, do not cite the Harrigan Provisional at all as allegedly teaching either a first outer gun carrier (claim 1) or a second outer gun carrier (claim 9) ‘connected to’ a tandem seal adapter.” (citing Rodgers Decl. ¶ 76)). Moreover, as also noted by Patent Owner, in the paragraphs of the Wooley Declaration cited in that section of the Petition, Dr. Wooley does not cite to or discuss the Harrigan Provisional. See Wooley Decl. ¶¶ 116–117; Prelim. Resp. 74.²⁰ For these reasons, at this stage of the proceeding, we determine that Petitioner has not made a sufficient showing that Harrigan discloses the “connected to” limitation with an effective filing date prior to claim 1.

(2) Conclusion

Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include claim 1 in the

²⁰ Patent Owner also discusses additional, but more generalized, alleged failings of the Harrigan Provisional (*see* Prelim. Resp. 75–80) and Harrigan (*see id.* at 80–83) in a section ostensibly providing an “Overview of the Harrigan References.” *Id.* at 73–83.

context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

b. Claim 2

For dependent claim 2 (which depends from claim 1), Petitioner contends that Harrigan discloses each limitation. Pet. 102–03. Patent Owner does not present any arguments specifically addressing claim 2. We include claim 2 in the context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

c. Claim 8

Claim 8 depends directly from claim 1, adding the requirement for “a spring-loaded electrical connection positioned adjacent to the tandem seal adapter.” Ex. 1001, 12:26–28. Petitioner contends that Harrigan discloses the additional limitation. Pet. 103–04. Patent Owner argues that Harrigan does not. *See Prelim. Resp.* 86–89.

Specifically, Petitioner provides the following annotated version of Figure 5A of Harrigan:

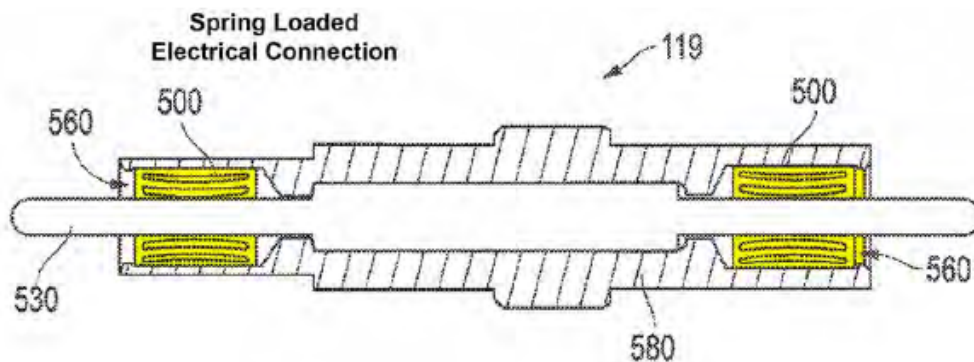


FIG. 5A

Pet. 103. Prior to annotation, Figure 5A is “a side cross-sectional view of an embodiment of a modular feedthru assembly for coupling a bulkhead to the

initiator assembly module of FIGS. 3A and 3B.” Ex. 1008 ¶ 19. In the annotated version of Figure 5A here, Petitioner added (1) a text box identifying a “Spring Loaded Electrical Connection” and (2) yellow highlighting identifying element 500. Pet. 103. According to Petitioner, “Harrigan discloses claim 8 at least by disclosing a spring positioned adjacent to the bulkhead.” *Id.* Petitioner adds that “[t]he bow spring (yellow) defines the inner diameter of the barrel insert securing the pin connector in place” (Pet. 104 (citing Ex. 1008 ¶ 43)) and “[t]he bow springs help ensure that a secure ground contact is maintained between the initiator assembly module on one end and the connector on a second end” (*id.* (citing Wooley Decl. ¶ 127)). According to Petitioner, the Harrigan Provisional “notes repeatedly that the device includes ‘[s]pring-loaded connectors to prevent shock-related disconnections.’” *Id.* (citing Ex. 1011 at 2, 7) (alteration in original).²¹

Patent Owner argues that neither Harrigan nor the Harrigan Provisional “discloses a separate spring-loaded electrical connection—i.e., that is not part of the feedthru—positioned adjacent to the tandem seal adapter” in that “the ‘contact springs’ of the Harrigan Provisional are part of the feedthru, shown in FIG. 5, that Petitioners apply against the claimed pressure bulkhead having a pin connector assembly.” Prelim. Resp. 86. In support, Patent Owner compares claims 3–5, which, according to Patent Owner, generally require “a spring-loaded electrical connection that is part of the pressure bulkhead having a pin connector assembly according to claim

²¹ Based on the express reference to “[t]he Harrigan Provisional” (Pet. 104), we understand Petitioner’s citation to Exhibit 1013 to have been intended as a citation to Exhibit 1011.

1” to claim 8, which, according to Patent Owner, generally requires “a separate spring-loaded electrical connection that the electrical connection assembly of claim 1 *further* comprises.” *Id.* at 87 (underlined emphasis added). Patent Owner also highlights an alleged disclosure of “an exemplary separate spring-loaded electrical connection positioned adjacent to the tandem seal adapter, according to claim 8,” in the Specification. *See id.* at 87–88 (citing Ex. 1001, 6:30–32, 7:58–60; Rodgers Decl. ¶ 161).

At this stage of the proceeding, this argument by Patent Owner does not identify a deficiency in the Petition. To accept Patent Owner’s argument, we would have to construe claim 8 as *not including* a “spring-loaded electrical connection” positioned in the “pin connector assembly” based on claims 3–5 specifying that their “pin connector assembly” further comprise one or more “spring loaded contact pin”(s). *See* Prelim. Resp. 88–89 (arguing that Harrigan and the Harrigan Provisional do not disclose the limitation in claim 8 under the proposed construction). We decline to do so at this stage of the proceeding.

First, Patent Owner appears to assume that “spring-loaded electrical connection” in claim 8 has the same meaning as “spring loaded contact pin” in claims 3–5. Second, and more importantly, with this argument, Patent Owner implicitly takes the position that two sets of dependent claims—here, claims 3–5 and claim 8—each depending from the same independent claim, can *only* cover *mutually exclusive* subject matter. Patent Owner, however, does not identify case law supporting that proposition. Here, claim 8 depends directly from claim 1 and does not specify the location of the recited “spring-loaded electrical connection.” We decline to limit claim 8 to the location in a preferred embodiment, such as Figure 19, as argued by

Patent Owner (Prelim. Resp. 87–88). *See Anchor Wall Sys., Inc. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 1306–07 (Fed. Cir. 2003) (stating that “the mere fact that the patent drawings depict a particular embodiment of the patent does not operate to limit the claims to that specific configuration”). The parties should develop these issues as appropriate.

Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include claim 8 in the context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

d. Claim 9

For dependent claim 9, Petitioner contends that Harrigan discloses each limitation (to the extent not indefinite). Pet. 104–05. Patent Owner argues that neither Harrigan nor the Harrigan Provisional discloses “a second outer gun carrier connected to the second end of the tandem seal adapter” as recited in claim 9. *See* Prelim. Resp. 89. Petitioner takes the position that the limitation at issue “is disclosed in Harrigan[,] which teaches that a modular perforating gun may be connected to ‘another modular gun component,’ and that the disclosed guns may be ‘provided in series.’” Pet. 105 (citing Ex. 1008 ¶¶ 21, 40).

Even assuming that Harrigan would be understood as disclosing the limitation at issue, as noted by Patent Owner, Petitioner does not cite to or discuss the Harrigan Provisional *at all* in relation to claim 9. *See* Pet. 104–05; *see* Prelim. Resp. 74 (“In fact, Petitioners and their expert, Dr. Wooley, do not cite the Harrigan Provisional at all as allegedly teaching either a first outer gun carrier (claim 1) or a second outer gun carrier (claim 9) ‘connected

to’ a tandem seal adapter.” (citing Rodgers Decl. ¶ 76)). Moreover, as also noted by Patent Owner, in the paragraphs of the Wooley Declaration cited in that section of the Petition, Dr. Wooley does not cite to or discuss the Harrigan Provisional. *See* Wooley Decl. ¶¶ 128–129; Prelim. Resp. 74.

Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include claim 9 in the context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

e. Claim 10

For dependent claim 10 (which depends from claim 9), Petitioner contends that Harrigan discloses each limitation. Pet. 105–06. Patent Owner does not present any arguments specifically addressing claim 10. We include claim 10 in the context of this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

K. Asserted Obviousness of Claim 8 Based on the SafeJet System and Backhus

Petitioner asserts that claim 8 of the ’697 patent would have been obvious under 35 U.S.C. § 103 based on the SafeJet System and Backhus. Pet. 8, 107–12. Patent Owner provides arguments specifically addressing this asserted ground. Prelim. Resp. 90–95. We first summarize aspects of Backhus.

1. Backhus

In this asserted ground, Petitioner relies on Backhus, in addition to the SafeJet System (summarized above (*see* § II.H.1)). Backhus discloses a

spring-loaded connection between a first subsystem and a second subsystem of a perforating gun. *See* Ex. 1010, code (57), 22:5–12.

Figure 4B of Backhus is reproduced below:

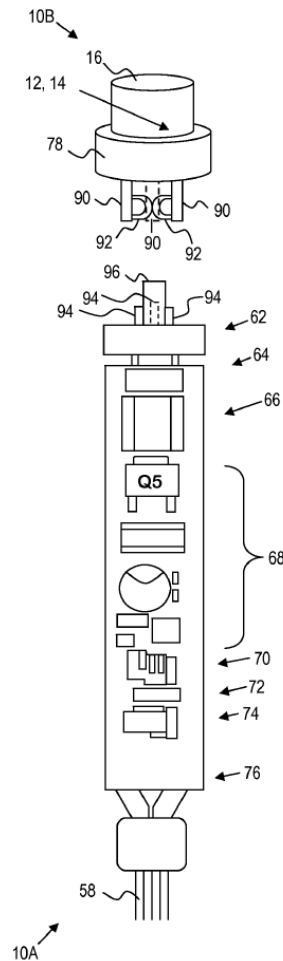


FIG. 4B

Backhus describes Figure 4B as “a schematic illustration of an alternative two-component detonator system.” Ex. 1010, 6:1–2. In particular, Backhus discloses that non-energetics-based detonator (NEBD) 10A has “a first pair of interface legs 90 [that] are separated apart by the insulating layer 96 and each leg 90 is spring biased against a corresponding one of the conductive contacts 94” of second NEBD 10B. *Id.* at 22:5–12.

Backhus explains that “the spring loaded conductors defining the self shunting features 92 of the first pair of interface legs 90 provide both a self shunting function and an electrical connection that couples the series circuit of the high voltage switch 12 and the initiator circuit 14.” *Id.* at 22:9–12.

2. Analysis

For dependent claim 8, Petitioner contends, in the alternative, that the proposed combination of the SafeJet System and Backhus discloses each limitation. Pet. 107–12. Specifically, Petitioner asserts that although the SafeJet System does not expressly disclose the added limitation of claim 8, “it would have been obvious to modify th[at] system[] to include the well-known feature of a spring-load[ed] electrical connection,” as taught by Backhus, and there would have been “ample motivation[]” and a “reasonable expectation of success in making the straightforward modifications to spring-load an electrical connection.” Pet. 106–07, 107–12 (addressing just this asserted ground). Petitioner first discusses why the SafeJet System and Backhus are analogous art (Pet. 106–07 (citing Wooley Decl. ¶¶ 131–132)) and then discusses why one of ordinary skill in the art “would have been motivated to consult other references,” aside from the SafeJet System (Pet. 108 (citing Wooley Decl. ¶¶ 133–134)). Then, Petitioner discusses the relied-upon aspects of Backhus (Pet. 109–10 (citing Wooley Decl. ¶ 132)) and why one of ordinary skill in the art would have been motivated to modify the SafeJet System, based on Backhus, with a reasonable expectation of success (Pet. 111–12 (citing Wooley Decl. ¶¶ 136, 138–141, 143)).

Patent Owner challenges the articulated reasons to combine the SafeJet System and Backhus for various technical reasons. *See* Prelim. Resp. 90–95. For example, Patent Owner argues that (1) “a spring-loaded

electrical connection would not be desirable at the bulkhead/loading tube interface in the SafeJet System, especially at the positions of the shock absorbers” and that, “[w]ere the plastic components spring-loaded electrical contacts, further redesign would be necessary to ensure that the bulkhead is constrained to be concentric within the carrier” (*id.* at 90, 91); (2) “the RCA-style connections between the feedthru and the loading tube in the SafeJet system would discourage the use of the spring-loaded electrical connections because it would risk disconnecting and/or damaging the electrical connection(s)” (*id.* at 91); (3) to the extent one of ordinary skill in the art “would hypothetically seek to modify the entire connection configuration of the SafeJet System to incorporate a spring-loaded electrical connection according to the challenged claims, they would not look to Backhus for teaching and would not arrive at the claimed subject matter in any event,” in part, because “the goals of the connector configuration in the detonator of Backhus are very different than for a selective perforating gun system” (*id.* at 93); and (4) Petitioner and Dr. Wooley “provide no explanation of how the electrical connection between subsystems in Backhus could be incorporated into the SafeJet system” (*id.* at 94). At this stage of the proceeding, these arguments raise numerous factual issues not adequately developed in the record. The parties should develop these issues as appropriate at trial.

Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

L. Asserted Obviousness of Claim 8 Based on Goodman and Backhus

Petitioner asserts that claim 8 of the '697 patent would have been obvious under 35 U.S.C. § 103 based on Goodman and Backhus. Pet. 8, 113–15. Patent Owner provides arguments specifically addressing this asserted ground. Prelim. Resp. 96.

1. Asserted References

In this asserted ground, Petitioner relies on Goodman (summarized above (*see supra* § II.I.1)) and Backhus (summarized above (*see* § II.K.1)).

2. Analysis

For dependent claim 8, Petitioner contends, in the alternative, that the proposed combination of Goodman and Backhus discloses each limitation. Pet. 106–07, 113–15. Specifically, Petitioner asserts that although Goodman does not expressly disclose the added limitation of claim 8, “it would have been obvious to modify th[at] system[] to include the well-known feature of a spring-load[ed] electrical connection,” as taught by Backhus, and there would have been “ample motivation[]” and a “reasonable expectation of success in making the straightforward modifications to spring-load an electrical connection.” Pet. 106–07, 113–15 (addressing just this asserted ground). Petitioner first discusses why Goodman and Backhus are analogous art (Pet. 106–07 (citing Wooley Decl. ¶¶ 131–132)) and then discusses why one of ordinary skill in the art “would have been motivated to consult other references” aside from Goodman (Pet. 113). Then, Petitioner cites the prior discussion of the relied-upon aspects of Backhus (Pet. 114) and discusses why one of ordinary skill in the art would have been motivated to modify Goodman, based on Backhus, with a reasonable expectation of success (Pet. 114–15 (citing Wooley Decl. ¶¶ 144–151)).

Patent Owner challenges the articulated reasons to combine Goodman and Backhus for the same technical reasons discussed in the context of the prior ground based on the SafeJet System and Backhus. *See* Prelim. Resp. 96. As noted above, at this stage of the proceeding, these arguments raise numerous factual issues not adequately developed in the record. The parties should develop these issues as appropriate at trial.

Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

M. Asserted Obviousness of Claim 8 Based on SafeJet System and Harrigan

Petitioner asserts that claim 8 of the '697 patent would have been obvious under 35 U.S.C. § 103 based on the SafeJet System and Harrigan. Pet. 8, 116–18. Patent Owner provides arguments specifically addressing this asserted ground. Prelim. Resp. 96–97.

1. Asserted References

In this asserted ground, Petitioner relies on the SafeJet System (summarized above (*see* § II.H.1)) and Harrigan (summarized above (*see* § II.J.1)).

2. Analysis

For dependent claim 8, Petitioner contends, in the alternative, that the proposed combination of the SafeJet System and Harrigan discloses each limitation. Pet. 106–07, 116–18. Specifically, Petitioner asserts that although the SafeJet System does not expressly disclose the added limitation of claim 8, “it would have been obvious to modify th[at] system[] to include

the well-known feature of a spring-load[ed] electrical connection,” as taught by Harrigan, and there would have been “ample motivation[.]” and a “reasonable expectation of success in making the straightforward modifications to spring-load an electrical connection.” Pet. 106–07, 116–18 (addressing just this asserted ground). Petitioner first discusses why the SafeJet System and Harrigan are analogous art (Pet. 106–07 (citing Wooley Decl. ¶¶ 131–132)) and then discusses why one of ordinary skill in the art “would have been motivated to consult other references” aside from the SafeJet System (Pet. 116). Then, Petitioner discusses the relied-upon aspects of Harrigan (Pet. 116–17) and why one of ordinary skill in the art would have been motivated to modify the SafeJet System, based on Harrigan, with a reasonable expectation of success (Pet. 117–18 (citing Wooley Decl. ¶¶ 156–159)).

Patent Owner argues that “Schlumberger did, in fact, combine the SafeJet System with the feedthru shown in the Harrigan Provisional” but that “[n]either the SafeJet System nor the Harrigan references, alone or in combination, discloses each and every feature of claim 8 of the ’697 Patent.” Prelim. Resp. 96–97 (citing Rodgers Decl. ¶¶ 179–180). As discussed above (*see supra* § II.J.2.c), at this stage of the proceeding, Patent Owner does not identify a deficiency in Petitioner’s position that Harrigan satisfies the additional limitation of claim 8.

Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

N. Asserted Obviousness of Claim 8 Based on Goodman and Harrigan

Petitioner asserts that claim 8 of the '697 patent would have been obvious under 35 U.S.C. § 103 based on Goodman and Harrigan. Pet. 9, 118–20. Patent Owner provides arguments specifically addressing this asserted ground. Prelim. Resp. 97.

1. Asserted References

In this asserted ground, Petitioner relies on Goodman (summarized above (*see* § II.I.1)) and Harrigan (summarized above (*see* § II.J.1)).

2. Analysis

For dependent claim 8, Petitioner contends, in the alternative, that the proposed combination of Goodman and Harrigan discloses each limitation. Pet. 106–07, 118–20. Specifically, Petitioner asserts that although Goodman does not expressly disclose the added limitation of claim 8, “it would have been obvious to modify th[at] system[] to include the well-known feature of a spring-load[ed] electrical connection,” as taught by Harrigan, and there would have been “ample motivation[]” and a “reasonable expectation of success in making the straightforward modifications to spring-load an electrical connection.” Pet. 106–07; Pet. 118–20 (addressing just this asserted ground). Petitioner first discusses why Goodman and Harrigan are analogous art (Pet. 106–07 (citing Wooley Decl. ¶¶ 131–132)) and then discusses why one of ordinary skill in the art “would have been motivated to consult other references” aside from Goodman (Pet. 118–19 (citing Wooley Decl. ¶ 160)). Then, Petitioner cites the prior discussion of the relied-upon aspects of Harrigan (Pet. 119) and discusses why one of ordinary skill in the art would have been motivated to modify Goodman, based on Harrigan, with

a reasonable expectation of success (Pet. 119–20 (citing Wooley Decl. ¶¶ 161–166)).

Patent Owner argues that “Goodman and the Harrigan References are different iterations of the SafeJet System” but that “[n]either Goodman nor the Harrigan references, alone or in combination, discloses each and every feature of claim 8 of the ’697 Patent.” Prelim. Resp. 97 (citing Rodgers Decl. ¶¶ 181–183). As discussed above (*see supra* § II.J.2.c), at this stage of the proceeding, Patent Owner does not identify a deficiency in Petitioner’s position that Harrigan satisfies the additional limitation of claim 8.

Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

O. Asserted Lack of Written Description Support for Claims 1, 2, and 8–10

Petitioner asserts that claims 1, 2, and 8–10 of the ’697 patent lack adequate written description support under 35 U.S.C. § 112(a) because, according to Petitioner, the Specification “fails to describe a first outer gun carrier ‘connected to the first end of the tandem seal adapter’ or a second outer gun carrier ‘connected to the second end of the tandem seal adapter’” under the construction of “end” proposed by Petitioner. *See* Pet. 120–24; *see also id.* at 30–32 (proposing to construe “end” as “farthest or most extreme part or point”). Patent Owner provides arguments addressing Petitioner’s proposed construction of “end.” *See* Prelim. Resp. 20–23.

As discussed above (*see supra* § II.F.3), at this stage of the proceeding, we are not persuaded to adopt Petitioner’s narrow proposed

understanding of “first end” and “second end” of the tandem seal adapter. Thus, at this stage of the proceeding and on the current record, we determine that Petitioner has not made a sufficient showing that claims 1, 2, and 8–10 lack adequate written description support on this basis. Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

P. Asserted Indefiniteness of Claims 9 and 10

Petitioner asserts that claims 9 and 10 of the ’697 patent are indefinite because 35 U.S.C. § 112(f) applies to the phrase “bulkhead connector element” but the Specification fails to disclose adequately structure for performing the required function. *See* Pet. 124–26. For the reasons above (*see supra* II.F.4), we do not view Petitioner as carrying its burden to show that § 112(f) applies to “bulkhead connector element.” Moreover, even assuming that § 112(f) did apply, we alternatively view the Specification as providing adequate disclosure on the current record.

For these reasons, at this stage of the proceeding and on the current record, we determine that Petitioner has not made a sufficient showing that claims 9 and 10 are indefinite on this basis. Because the Petition shows more likely than not that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see supra* § II.H.2.a), we include this asserted ground in the instituted post-grant review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

Q. Asserted Lack of Enablement of Claim 2

Petitioner asserts that claim 2 lacks adequate enabling disclosure under 35 U.S.C. § 112(a). Pet. 9, 127–28. Patent Owner provides arguments addressing this asserted ground. Prelim. Resp. 26–28.²² Dependent claim 2 recites an “electrical connection assembly” in which “it is not possible to interrupt the electrical signal from the first pin connector end to the second pin connector end.” Ex. 1001, 11:48–50.

Petitioner asserts that “there are many scenarios where it would be possible to interrupt an electrical signal from one end of a contact pin to the other,” including “unintentional damage or deterioration preventing an electrical path between the first pin connector end to the second pin connector end, or intentional disassembly or destruction of the electrical path between the first pin connector end to the second pin connector end.” Pet. 127 (citing Wooley Decl. ¶ 179). Thus, Petitioner argues, “[t]here is no conceivable design for an electrical connector that is so robust that it is ‘not possible’ for the signal to be interrupted when an adjacent gun assembly is detonated.” Pet. 128 (citing Wooley Decl. ¶¶ 180–181) (emphasis omitted). According to Petitioner, “regardless of the amount of experimentation undertaken, one of ordinary skill in the art would not be able to make and use the invention of claim 2” because “[u]nlimited imagination and infinite experiments would be needed to demonstrate that it is ‘not possible’ to interrupt the signal.” *Id.* (citing Wooley Decl. ¶ 182).

Patent Owner responds that “Petitioner[] attempt[s] to demonstrate a lack of enablement by providing a laundry list of arbitrary ‘scenarios where

²² Although Patent Owner’s argument is in a section on claim construction, the discussion addresses the alleged lack of enablement.

it would be possible to [generally] interrupt an electrical signal from one end of a contact pin to the other.” Prelim. Resp. 26 (quoting Pet. 127–28). According to Patent Owner, “the enablement standard does not require that [one of ordinary skill in the art,] having read the specification[,], could generally practice any claim feature, in isolation, in any application or context.” *Id.* Patent Owner contends that one of ordinary skill in the art “would have a firm understanding for the materials, assembly, and electrical concepts required to carry out the invention of claim 2.” *Id.* (citing Rodgers Decl. ¶ 125). Then, Patent Owner asserts that the ’697 patent “sets forth and claims a more robust wireless assembly.” *Id.* at 27 (citing Ex. 1001, 6:13–15). According to Patent Owner, one of ordinary skill in the art “would understand how to make and use the claimed invention without undue experimentation based on this teaching in the ’697 Patent, along with common knowledge.” *Id.* (discussing Rodgers Decl. ¶¶ 126–128).

For purposes of this Decision, we are persuaded that the Petition shows more likely than not that Petitioner would prevail in demonstrating that claim 2 is not enabled by the Specification. “[T]o be enabling, the specification of a patent must teach those skilled in the art how to make and use *the full scope of the claimed invention* without undue experimentation.” *Trs. of Boston Univ. v. Everlight Elecs. Co.*, 896 F.3d 1357, 1362 (Fed. Cir. 2018) (alteration in original) (emphasis added). We consider certain factors to determine whether a disclosure satisfies the enablement requirement, including:

- (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the

predictability or unpredictability of the art, and (8) the breadth of the claims.

In re Wands, 858 F.2d 731, 737 (Fed. Cir. 1988).

As argued by Petitioner, the disclosures identified lack adequate direction or guidance (factor 2 above) as to how to make the “electrical signal” truly uninterruptable, as required to enable the *full scope* of the limitations at issue (factor 8). This is supported by the testimony of Dr. Wooley, who identifies “many scenarios where it would be possible to interrupt an electrical signal from one end of a contact pin to the other.” Wooley Decl. ¶ 179. Further supporting that the full scope of the limitations at issue is not enabled, both Patent Owner and its declarant argue as if the limitation at issue merely requires a *less interruptible* electrical signal (as compared to the prior art) rather than one that it is “not possible to interrupt,” as recited. *See, e.g.*, Prelim. Resp. 27 (discussing a “*more* robust wireless assembly” (emphasis added)); Rodgers Decl. ¶¶ 127–128 (same). Although the record is less developed as to the other *Wands* factors, the evidence as to factors 2 and 8 weighs in favor of Petitioner’s position. Accordingly, we determine, based on the current record, that the Petition shows more likely than not that Petitioner would prevail in demonstrating that claim 2 is invalid for lack of enablement.

III. CONCLUSION

For the reasons above, we determine that the Petition shows more likely than not that Petitioner would prevail with respect to at least one of challenged claims 1, 2, and 8–10 of the ’697 patent. At this stage of the proceeding, no final determination has yet been made with regard to the patentability of any of the challenged claims or any underlying factual or

legal issues, including the construction of claim terms. The final determination will be based on the record as developed during the post-grant review.

IV. ORDER

Accordingly, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 324(a), a post-grant review is hereby instituted as to claims 1, 2, and 8–10 of the '697 patent on all asserted grounds;

FURTHER ORDERED that pursuant to 35 U.S.C. § 324(c) and 37 C.F.R. § 42.4, post-grant review shall commence on the entry date of this Decision, with notice hereby given of the institution of a trial.

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Patent 10,844,697 B2

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