

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WERNER CO.,
Petitioner,

v.

LOUISVILLE LADDER, INC.,
Patent Owner.

IPR2019-00336
Patent 7,000,731 B2

Before WILLIAM V. SAINDON, JOHN P. PINKERTON, and
RICHARD H. MARSCHALL, *Administrative Patent Judges*.

MARSCHALL, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

INTRODUCTION

Werner Co. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting institution of an *inter partes* review of claims 8–16, 19, and 20 of U.S. Patent No. 7,000,731 B2 (Ex. 1001, “the ’731 patent”). Louisville Ladder, Inc., (“Patent Owner”) filed a Preliminary Response. Paper 7. Pursuant to 35 U.S.C. § 314, we instituted an *inter partes* review of claims 8–16, 19, and 20 of the ’731 patent on all presented challenges. Paper 10. After institution, Patent Owner filed a Response (Paper 12, “PO Resp.”), to which Petitioner filed a Reply (Paper 19, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 22, “PO Sur-reply”). An oral hearing in this proceeding was held on May 28, 2020, and a transcript of the hearing is included in the record (Paper 33, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 8–16, 19, and 20 of the ’731 patent are unpatentable.

BACKGROUND

A. Real Parties in Interest

Petitioner states that it is the sole real party in interest for Petitioner. Pet. 2. Patent Owner states that it is the sole real party in interest for Patent Owner. Paper 4, 2.

B. Related Matters

The parties identify the following proceeding that may affect, or could be affected by, a decision in this proceeding: *Werner Co. v. Louisville Ladder, Inc.*, No. 3-18-cv-00794-DJH (W.D. Ky.). Pet. 2; Paper 4, 2.

C. The '731 Patent

The '731 patent issued on February 21, 2006, from an application filed on July 30, 2002. Ex. 1001, codes (22), (45). The '731 patent relates to a “cover for an end of a ladder rail” that “includes a shell and a tread.” *Id.* at Abstract. The '731 patent describes a ladder rail end cover designed to achieve certain goals, such as maintaining skid resistance, protecting the end of the ladder rail, reducing susceptibility to wear and tear, allowing inspection of the ladder rail without removal of the cover, and allowing efficient production of the cover. *Id.* at 2:36–45. Figure 3 of the '731 patent is reproduced below.

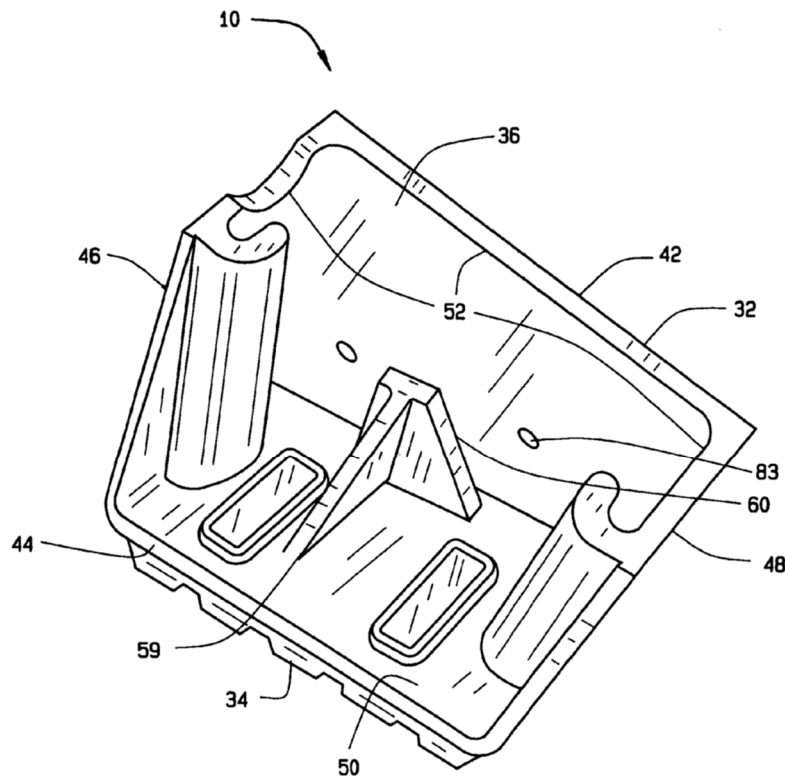


FIG. 3

Figure 3 is an “an inward side perspective view of a cover for an end of a ladder rail.” Ex. 1001, 3:1–2. Figure 3 depicts cover 10 having shell 32 and tread 34. *Id.* at 4:60–62. Shell 32 typically consists of a hard durable material while tread 34 typically consists of a softer, skid-resistant material. *Id.* at 5:6–9. Shell 32 includes opening 36, having channel 52, sized to receive end 14 of front ladder rail 16. *Id.* at 5:15–17, 5:66–6:1. Shell 32 also includes exterior wall 42, interior wall 44, side walls 46 and 48, and lower wall or base 50. *Id.* at 5:46–50. Figure 3 also depicts web engagement member 59 extending upwardly from base 50, and forming slot 60 between engagement member 59 and exterior wall 42, with slot 60 receiving a portion of ladder rail web 31. *Id.* at 6:38–44. In Figure 3, “the shell 32 has a substantially open side or face so that a portion of the ladder rail 16 remains exposed or visible even after the cover 10 has been placed over the end 14 of the ladder rail 16.” *Id.* at 6:61–64.

The '731 patent also describes various methods of attaching tread 34 to the bottom of shell 32. Figures 7 and 8 of the '731 patent are reproduced below.

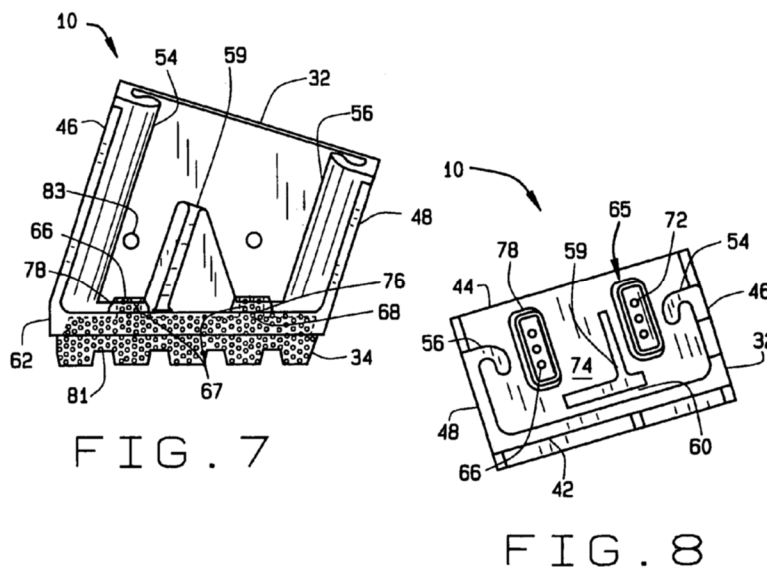


Figure 7 “is an inward side view of the cover shown in FIG. 3,” while Figure 8 “is an upper view of the cover shown in FIG. 3.” Ex. 1001, 3:9–11. Figures 7 and 8 depict shell 32 having “shell interlocking or mating member 65” comprised of raised portions 78 surrounding holes 66. *Id.* at 7:43–55. Figure 7 also depicts tread 34 having portion 67 that flowingly engages shell interlocking member 65. *Id.* at 7:31–34. This arrangement allows engagement between shell interlocking member 65 and tread portion 67 after tread portion 67 has solidified, forming an interlocking bond between shell 32 and tread 34. *Id.* The ’731 patent also describes an interlocking chemical bond between shell 32 and tread 34. *See id.* at 10:31–34, 11:44–12:15. Both the physical bond and chemical bond comprise at least a portion of shell 32 and tread 34. *Id.* at 10:14–18.

The ’731 patent further describes the use of fasteners such as screws or rivets “[i]n addition” to using at least one bond. Ex. 1001, 10:35–45. The advantage of using fasteners in addition to at least one bond, according to the ’731 patent, is an added “margin of safety” should the bond or fastener fail. *Id.* at 10:40–45.

D. Challenged Claims

Petitioner challenges claims 8–16, 19, and 20. Of those, claims 8, 10, 12, and 14 are independent. Claim 8 is reproduced below.

8. A cover for an end of a ladder rail, the cover comprising:
 - a shell formed of at least one material, said shell having a size suitable for engaging the ladder rail, said shell having a first wall with a pair of side walls extending from opposite ends thereof, said shell having an entirely open face opposite said first wall and between said pair of side walls, said open face suitable for exposing a portion of the ladder rail when the ladder rail and said shell are engaged; and

a tread formed of at least one other material, said tread being engaged with said shell at least partially by at least one bond, said at least one bond comprising at least a portion of said shell and at least a portion of said tread.

Ex. 1001, 17:10–24.

E. Asserted Grounds

Petitioner asserts four grounds of unpatentability. Specifically, Petitioner challenges (Pet. 14):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
8–11	102(a)	Louisville Catalog ¹
8–11	102(b)	Louisville Catalog
8–16	103(a)	Plotner, ² Louisville Catalog
8–16	103(a)	Plotner, Louisville Catalog, Werner Brochure ³
19, 20	103(a)	Plotner, Louisville Catalog, Werner Brochure, Modern Plastics Handbook ⁴

¹ Petitioner refers to three documents as the “Louisville Catalogs.” Pet. 7–8 (citing *Louisville Ladder Professional Product Catalog* (distribution list dated May 18, 1999) (Ex. 1002); *Rhino 375 Fiberglass Step Ladder* (Ex. 1003); *Louisville Ladder New Full Line Catalog 2001* (Ex. 1004)). For its assertions, Petitioner relies on a “Rhino 375” ladder shown in each catalog and contends that the relevant disclosure is common to all three catalogs. *Id.* at 8, 14. We do not view Petitioner’s assertions as relying on any improper combination of the Louisville Catalogs, as Patent Owner contends. *See* PO Resp. 20–21. We will refer and cite to the *Louisville Ladder New Full Line Catalog 2001* (Ex. 1004) as the “Louisville Catalog” when addressing Petitioner’s contentions. *See* Tr. 55:21–23 (Petitioner’s counsel stating that “the Board can pick any one of those catalogs because they all show the same ladder, they all show the same feature”).

² U.S. Patent No. 5,636,706, issued June 10, 1997 (Ex. 1005) (“Plotner”).

³ *T7200 Werner Pro Series* (printed April 2000) (Ex. 1006) (“Werner Brochure”).

⁴ Modern Plastics and Charles A. Harper, *Modern Plastics Handbook*, (Charles A. Harper, ed. 2000) (Ex. 1007) (“Modern Plastics Handbook”).

Petitioner also relies on the Declaration of Jon B. Ver Halen. Ex. 1010 (“Ver Halen Declaration”).

Patent Owner relies on the Declaration of Thomas J. Schmitt (Ex. 2002) and the Declaration of Mack A. Quan (Ex. 2003).

ANALYSIS

A. Legal Standards

To prevail in its challenges, Petitioner must prove unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e) (2012); 37 C.F.R. § 42.1(d) (2018). “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burdens of proof in an *inter partes* review).

Petitioner relies on both anticipation and obviousness in its challenges to the claims of the ’731 patent. To anticipate a claim under 35 U.S.C. § 102, “a single prior art reference must expressly or inherently disclose each claim limitation.” *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008). That “single reference must describe the claimed invention with sufficient precision and detail to establish that the subject matter existed in the prior art.” *Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1120 (Fed. Cir. 2002).

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

B. Level of Ordinary Skill in the Art

The level of 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 who is 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). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* In a given case, one or more factors may predominate. *Id.*

Petitioner contends that a “person having ordinary skill in the art would have had a bachelor’s degree in mechanical engineering, industrial engineering or a related field, plus 5–7 years of experience with ladder design or analysis.” Pet. 7. Patent Owner contends that “a POSITA would have had an undergraduate degree in a relevant engineering field (e.g.,

mechanical engineering) with 3–5 years of practical experience in the manufacture, engineering, and/or research, development, and testing of ladders and related components. Of course, more education can supplement relevant experience and vice versa.” PO Resp. 6.

The parties’ proposals do not differ in any respect that would suggest our determination on this issue would impact any of our findings in this case. At oral argument, the parties agreed that no issue in this case turns on the differences in the parties’ respective proposals. *See* Tr. 31:18–24 (Patent Owner’s counsel stating that “we do not believe that that slight difference between Petitioner and Patent Owner would be dispositive of any issue in the case”), 55:25–56:9 (Petitioner’s counsel stating that “all parties and experts agree that there’s no material difference in the proposed level of ordinary skill in the art”).

The parties’ respective proposals differ in the number of years of experience required in the ladder design field; Petitioner proposes 5–7 years of experience, while Patent Owner proposes 3–5 years. Pet. 7; PO Resp. 6. Based on the full record before us, because the asserted references describe problems and solutions of ladder design that are relatively straightforward and presumably understandable with only a few years of industry experience, we apply Patent Owner’s proposal to our analysis because it requires fewer years of that experience.

C. Claim Construction

In *inter partes* reviews, we interpret claims in the same manner used in a civil action under 35 U.S.C. § 282(b). *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340, 51,340, 51,358

(Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)); *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc) (setting forth claim construction approach in district court cases). Under that standard, we generally give claim terms their ordinary and customary meaning, as would have been 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 is generally “less reliable” than the intrinsic record. *See id.* at 1318–19. Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

The parties propose differing constructions for the terms “bond,” “entirely open face,” and “extending upwardly.” We address each limitation in turn below.

1. “Bond”

Petitioner contends that we should construe the phrase “at least one bond, said at least one bond comprising at least a portion of said shell and at least a portion of said tread” (the “bond limitation”) in each of the challenged claims as covering “any type of bond.” Pet. 12. According to Petitioner, “[b]y necessity, a bond between two objects comprises at least a portion of each object.” *Id.* Petitioner further contends that the specification supports its construction by describing three types of bonds—“interlocking mating members, chemical-type bonds, and mechanical fasteners.” *Id.*

(citing Ex. 1001, 10:18–40). Petitioner also relies on claim 1, which is not challenged, and which requires a “bond *independent of mechanical fasteners*.” *Id.* at 13. Petitioner contends that the challenged claims omit this language and, therefore, cover bonds with mechanical fasteners. *Id.* (citing Ex. 1001, 17:10–18:49; Ex. 1010 ¶¶ 111–112). Petitioner also alleges that the prosecution history supports its construction because the Examiner stated that the “independent of mechanical fasteners” language in claim 1 would be given no patentable weight because it was a negative limitation. *Id.* (citing Ex. 1018, 191, 201).

Patent Owner argues that the bond limitation should be construed to mean “at least one means of chemical and/or physical engagement, said at least one engagement means comprising at least a portion of said shell and at least a portion of said tread.” PO Resp. 7. Patent Owner describes the claimed “bond” as including a physical bond, such as an interlocking bond, a chemical bond, or a combination of both. *Id.* at 8 (citing Ex. 1001, 7:28–42, 10:14–29, 11:34–43, 12:64–14:2). Patent Owner takes issue with the breadth of Petitioner’s construction, which includes “any type of bond, *including mechanical fasteners*.” *Id.* at 9. Patent Owner contends that including mechanical fasteners cannot be correct because claim 16 “further” requires “a mechanical fastener,” which would be rendered meaningless if independent claim 14 already included mechanical fasteners. *Id.* Patent Owner also relies on the specification, which distinguishes between the claimed bonds and mechanical fasteners. *Id.* at 10 (citing Ex. 1001, 10:35–45, 14:3–14). Patent Owner further relies on the prosecution history with respect to claim 1. Patent Owner argues that, during prosecution, the limitation “independent of mechanical fasteners” did not narrow the scope of

“bond,” which the Examiner confirmed by treating the limitation as not limiting. *Id.* at 10–11. According to Patent Owner, this prosecution history supports its position that the “bond” limitation already excluded fasteners from its scope. *Id.* at 11–13.

In its Reply, Petitioner contends that the Specification uses the term “bond” broadly to cover a wide range of bonds. Pet. Reply 8–9 (citing Ex. 1001, 1018–21). Petitioner also argues that the claim’s “comprising” transition allows for the inclusion of fasteners, the prosecution history suggests that the limitation should include fasteners, and dependent claim 16 does not mandate Patent Owner’s narrow construction. *Id.* at 9–10. Petitioner also contends that Patent Owner has put a further gloss on its construction by trying to limit the limitation to certain preferred embodiments that discuss bonds formed by flowing the tread material into the shell. *Id.* at 11 (citing Paper 12, 8; Ex. 2002 ¶ 44; Ex. 2003 ¶ 68).

In its Sur-reply, Patent Owner argues that (1) the Specification makes clear that the bond includes more than a physical attachment, such as a fastener or rivet; (2) although the term “comprising” does not exclude fasteners, it “cannot be used to subvert the ordinary and customary meaning of the term ‘bond,’”; and (3) the file history shows that applicants “repeatedly clarified that the ‘bond’ did not include mechanical fasteners.” PO Sur-reply 3–5. Patent Owner also argues that dependent claim 16 supports a broad construction of “bond” in claim 14 because it refers to a “cover of claim 14, further comprising a mechanical fastener,” not that claim 14’s bond “comprises a fastener.” *Id.* at 5.

We agree with Patent Owner that the proper construction of “bond” does not encompass mechanical fasteners. First, as to the claim language,

we disagree with Petitioner's argument that all bonds, including fasteners, necessarily include a portion of the shell and tread as the claim requires. Pet. 12. Instead, the requirement that the bond include a portion of the shell and a portion of the tread suggests something more than a third structure such as a fastener as the bonding structure. In other words, when a fastener joins a tread to a shell, neither the tread nor the shell aids in holding the two together; the fastener performs that "bonding" function. Further, independent claim 14 already requires a "bond," and claim 16, which depends from claim 14, "further" requires a "mechanical fastener" in addition to the bond, without describing it as a species of bond. Ex. 1001, 18:40–41. Reading the "bond" of claim 14 to encompass the "mechanical fastener" of claim 16 would conflict with claim 16's treatment of the mechanical fastener requirement as separate from the bond limitation. As Patent Owner notes, claim 16 does not state that the bond further comprises a fastener; it states that the cover further comprises a fastener. *See* PO Sur-reply 5. This claim structure at least suggests that "bond" in claim 14 does not encompass fasteners. Further, the use of the "comprising" transition language merely allows for the addition of unclaimed fasteners to the independent claims without falling outside the scope of the claims. That well known aspect of the "comprising" language does not mandate a broader reading of "bond" to include fasteners.

Second, we agree with Patent Owner that the Specification distinguishes between the claimed bonds and the use of mechanical fasteners. PO Resp. 9–10. First, in the Background, the Specification stresses the need for a bond that goes beyond the prior art use of mechanical fasteners. *See* Ex. 1001, 2:19–27. Later, in the Detailed Description, the

Specification describes the use of mechanical fasteners as “in addition” to the physical or chemical bonds, and as a further safety feature should the bond fail. *See id.* at 10:35–45; 14:3–14. The most natural reading of these passages supports Patent Owner’s position that fasteners are distinct from, and could optionally be used in addition to, bonds, not that fasteners are a type of bond.

Third, the prosecution history does not support Petitioner’s argument that “bond” must encompass fasteners. For example, the applicants’ statement during prosecution that the claimed bond “independent of mechanical fasteners” in claim 1 does not narrow the scope of the claims, and the Examiner’s apparent agreement does not support Petitioner’s position that the claimed “bond” includes mechanical fasteners. Ex. 1018, 191, 201. The failure of that limitation to narrow claim 1 could also support Patent Owner’s reading that the bond limitation already excluded mechanical fasteners, rendering the additional language superfluous, and does not amount to a clear statement regarding the breadth of the bond limitation. Petitioner’s reliance on further statements by the Examiner during prosecution that gives “bond” a broad construction that includes fasteners does not require such a broad reading here, especially when the applicant consistently maintained its narrower view of the language during prosecution. *See* Pet. Reply 9–10; PO Sur-reply 4–5; Ex. 1018, 191.

Based on the foregoing, we view the claim language, when read in light of the other claims and Specification, as strongly supporting Patent Owner’s construction. The prosecution history contains statements by the Examiner and applicants that support both parties’ positions, and due to that lack of clarity the prosecution history does not require a broader construction

than the claims and Specification indicate. Although we considered Petitioner's declarant testimony in support of its broader construction, we find that testimony at odds with the intrinsic record and not sufficiently persuasive to compel a different construction. *See, e.g.* Ex. 1010 ¶¶ 110–111; *Phillips*, 415 F.3d at 1318 (“[A] court should discount any expert testimony ‘that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history.’” (citation omitted)). Accordingly, we do not adopt Petitioner's proposed construction of the claimed “bond” to include mechanical fasteners. We instead adopt Patent Owner's construction of the “bond” limitation: “at least one means of chemical and/or physical engagement, said at least one engagement means comprising at least a portion of said shell and at least a portion of said tread.” Importantly, the claimed “bond” does not encompass mechanical fasteners.

2. “*Entirely Open Face*”

Independent claim 8 requires a “shell having an *entirely open face* opposite said first wall and between said pair of side walls, said open face suitable for exposing a portion of the ladder rail when the ladder rail and said shell are engaged” (emphasis added). Dependent claim 13 requires a similar limitation, but without a first wall or side walls. *See* Ex. 1001, 18:20–23. Patent Owner contends that we should construe “entirely open face” “to refer to a face of the shell by which the lowermost interior surface and corners of the ladder rail are sufficiently exposed both for inspection during use and proper fitting of the shell.” PO Resp. 13. According to Patent Owner, the ladder industry knew that the bottom ends of fiberglass ladder rails could crack, and conventional brackets or shoes placed on the

ends of the rails would obscure a view of those rails. *Id.* at 13–14 (citing Ex. 2002 ¶¶ 52–53). Patent Owner points to the Specification as describing a solution to this problem in the form of a “substantially open face” of shell 32, which supports construing the claimed “entirely open face” to exclude structures that prevent inspection of the ladder rails. *Id.* at 14–15 (citing Ex. 1001, 1:66–2:5, 7:10–14). Patent Owner also contends that the prosecution history supports this construction, arguing that applicants distinguished the prior art Hurd reference on this basis. *Id.* at 15–17 (citing Ex. 1018, 211, 229, 242–43, 250, 258; Ex. 2004, 50–53, 100–104, Figs. 1, 2, 6).

Petitioner contends that Patent Owner’s proposed construction includes terms that are not found in the claims, Specification, or file history, and therefore the intrinsic record fails to support such a narrow construction. Pet. Reply 3. Petitioner contends that the claim term “face” refers to one side of the shell, which means “entirely open face” refers to the open side or face of shell 32 described in the Specification and depicted in the Figures. *Id.* at 3–4 (citing Ex. 1001, 6:61–64, 6:66–7:2, 11:1–20, Figs. 3, 9). Petitioner argues that claim 8 does not require any particular portion of the ladder rail to be exposed, such as “the lowermost interior surface and corners of the ladder rail,” as set forth in Patent Owner’s proposed construction. *Id.* at 6.

In its Sur-reply, Patent Owner argues that the open face is not limited to one side of the shell, as Petitioner contends, and can be anywhere along the base of the shell, between the sidewalls. PO Sur-reply 6–7 (citing Ex. 1001, Fig. 3; Ex. 1025, 134:3–139:17). Patent Owner further argues that the Specification further supports the view that the entirely open face “is inclusive of the entire area between the side walls.” *Id.* at 8 (citing Ex. 1001,

6:66–7:14). Patent Owner also argues that the portion that must be exposed by the entirely open face “necessarily includes the lowermost interior surfaces and corners,” and argues that the Specification “makes clear” that this was “the fundamental advantage offered by” the claimed end rail cover. *Id.* at 9.

We agree with Petitioner that Patent Owner’s proposed construction for “entirely open face” is too narrow. The crux of Patent Owner’s construction is that “the lowermost interior surface and corners of the ladder rail are sufficiently exposed both for inspection during use and proper fitting of the shell.” PO Resp. 13. The language of claim 8 does not support this construction. Claim 8 defines how much of the ladder rail must be exposed, and merely states that “a portion of the ladder rail” must be exposed when the shell and rail are engaged. Ex. 1001, 17:16–19; *see also id.* at 18:20–22 (claim 13 requiring “said shell defines an entirely open face so that a portion of the ladder rail is exposed”). The claim language does not state that any particular “portion” of the rail, much less “the lowermost interior surface and corners” of the rail, must be exposed. The absence of such specificity in the claim language counsels against reading in that limitation. In addition, the Specification does not suggest that the exposed “portion” of the rail referred to in claim 8 must include those portions identified in Patent Owner’s construction. Instead, the Specification refers broadly to the disadvantages of needing to remove protective boots to inspect the rail, and the need to expose enough of the rail to perform an inspection, without mentioning any specific portions that must be exposed. Ex. 1001, 1:66–2:5, 6:61–7:14. Patent Owner also acknowledges that the claims cover Figures 3 and 9, and Figure 3 shows structures occluding portions of the lowermost

portion of the ladder rail, such as rail flange retainers and web engagement member 59. Patent Owner's effort to construe the claim to cover a face that exposes specific portions of the ladder rail that are somewhat exposed in its own figures, while not allowing for any less exposure of the rail, demands much more precision than the claim language and Specification provide. The prosecution history also fails to provide that specificity, as at most it reveals that the applicants distinguished the claims over prior art that largely surrounded the ladder rail on four sides, exposing only small portions of the rail. *See* Ex. 1018, 250; Ex. 2004, Figs. 1, 2, 6.

Based on the foregoing, we decline to adopt Patent Owner's proposed construction. The parties further dispute whether the claimed "face" corresponds to the plane or missing side opposite exterior wall 42, above interior wall 44 (as Petitioner proposes), or includes any plane along base 50 within the interior of shell 32 (as Patent Owner proposes). *See* Pet. Reply 4–5; PO Sur-reply 6–7. We need not resolve this issue because it appears that Patent Owner's proposal is broader than, and would encompass, the "face" Petitioner identifies, and would therefore fail to aid Patent Owner in its efforts to distinguish over the prior art. Nevertheless, we agree with Petitioner that the more natural reading of "face," in light of the Specification, refers to a single plane on the side opposite exterior wall 42 and above interior wall 44. *See* Ex. 1001, 6:61–7:10. This comports with the "entirely open" aspect of the claim language, as only the side opposite interior wall 42 and above interior wall 44 is shown as "entirely open" in Figures 3 and 9, while the inside of the shell contains structures that render that area not entirely open. *See id.* at Figs. 3, 9.

3. *“Extending Upwardly”*

Independent claim 10 requires a “rail flange retainer extending upwardly from a bottom of said shell.” Patent Owner contends that we should construe “extending upwardly” “to require that the recited rail flange retainers are integral with the shell.” PO Resp. 17 (citing Ex. 2002 ¶ 58). Patent Owner argues that the Specification supports its construction by describing rail flange retainers 54 and 56 that impede twisting of cover 10 with respect to the ladder rail. *Id.* (citing Ex. 1001, 5:47–50, 6:14–24). According to Patent Owner, this makes clear “that the shell of the claimed cover is a unitary construction—a single component—and the respective side walls and rail flange retainers included as part of the shell form a part of that unitary construction.” *Id.* at 17–18 (citing Ex. 2002 ¶ 59). Patent Owner also points to the Specification’s figures as limited to shells having “a one-piece, unitary construction,” and to the description of manufacturing methods employing plastic that would produce only such shells. *Id.* at 18–19 (citing Ex. 1001, 11:18–33, 11:45–12:15, Figs. 3–18; Ex. 2002 ¶¶ 60–61). Patent Owner further contends that the claim language itself, referring to retainers that extend upwardly from “said shell,” when read in light of the Specification, supports Patent Owner’s construction. *Id.* at 19 (citing Ex. 2002 ¶ 62).

Petitioner disagrees with Patent Owner’s “integral” construction and contends that one of ordinary skill in the art “would have known an integral design is necessary only when using certain plastic materials that have limited strength.” Pet. Reply 7 (citing Ex. 2002 ¶¶ 39, 58–61; Ex. 1025, 128:18–129:6). Petitioner argues that stronger plastic or metal shells would not require an integral design and that claim 10 does not limit the shell to a

plastic material that requires integral construction. *Id.* (citing Ex. 2002 ¶ 61; Ex. 1025, 129:12–20, 130:5–12, 153:15–155:6).

In its Sur-reply, Patent Owner argues that the possible use of a stronger shell material such as metal does not counsel against the need for an integral shell. PO Sur-reply 11. According to Patent Owner, “the ’731 Patent is necessarily describing a construction in which the rail flange retainers are integral with the base of the shell.” PO Sur-reply 11 (citing Ex. 2002 ¶ 61).

We agree with Petitioner that “rail flange retainer extending upwardly from a bottom of said shell” in claim 10 does not require rail flange retainers that are integral with the shell base as Patent Owner proposes. First, nothing in the claim language suggests an integral construction, and Patent Owner does not suggest otherwise by arguing that “extending upwardly,” standing alone, requires an integral construction. Second, nothing in the claim language suggests a shell material made of plastic that would necessarily be made using an integral, one-piece construction. Third, while the Specification may disclose integral, one-piece shells, and retainers that help align the ladder rail and impede twisting of the rail, nothing in the Specification suggests that these functions can only be performed by a unitary shell with integral retainers. *See* Ex. 1001, 6:14–24. We recognize that Patent Owner’s declarant reads the Specification as necessarily requiring such a unitary design based on these same passages, but we decline to read such a limitation into the claims where the claim language and Specification remains silent on the need for an “integral” shell, and we find that testimony unpersuasive. *See* Ex. 2002 ¶¶ 59–62. Based on the foregoing, we do not construe “rail flange retainer extending upwardly from

the bottom of said shell” in claim 10 as requiring rail flange retainers that are integral with the shell.

C. Challenges Under 35 U.S.C. § 102(a)/(b) Based on the Louisville Catalog and Under 35 U.S.C. § 103(a) Based on Plotner and the Louisville Catalog.

Petitioner challenges claims 8–11 under 35 U.S.C. § 102(a)/(b) as anticipated by the Louisville Catalog and claims 8–16 under 35 U.S.C. § 103(a) as unpatentable over Plotner and the Louisville Catalog. Pet. 14–48. Petitioner expressly conditions both of these challenges on our adoption of Petitioner’s proposed construction of the bond limitation that includes mechanical fasteners. *Id.* at 14, 21. For the reasons discussed above in our construction of the bond limitation, we reject Petitioner’s proposed construction and conclude that “bond” does not include mechanical fasteners. Accordingly, because we reject Petitioner’s stated premise for these challenges, we conclude that Petitioner has not proven by a preponderance of the evidence that claims 8–11 are anticipated by the Louisville Catalog or that claims 8–16 would have been obvious based on Plotner and the Louisville Catalog.

D. Obviousness of Claims 8–16 Based on the Louisville Catalog, Plotner, and the Werner Brochure

Petitioner challenges claims 8–16 under 35 U.S.C. § 103(a) as unpatentable over the Louisville Catalog, Plotner, and the Werner Brochure. Pet. 49–54. For this ground, Petitioner cites to the asserted references and the Ver Halen Declaration. *Id.* For purposes of this challenge, Petitioner

assumes that we construe the bond limitation in a manner that *excludes* fasteners, consistent with our claim construction above. *Id.* at 49.⁵

Patent Owner, relying on its declarant testimony, contends that the references fail to disclose several limitations of the challenged claims and that one of ordinary skill in the art would not have combined the references. PO Resp. 20–52.

1. *The Louisville Catalog*

The Louisville Catalog discloses a series of ladders as part of Louisville Ladder’s 2001 “Full Line Catalog.” Ex. 1004, 1. Petitioner relies on the “Rhino 375” ladder shown on page 2 of the Louisville Catalog. *Id.* at 2; Pet. 8. Photos depicting the Rhino 375 Ladder from the Louisville Catalog appear below.



⁵ Both parties incorporate their arguments made in the context of the previous challenges as to the Louisville Catalog and Plotner into their arguments for this challenge. *See* Pet. 49 (relying on arguments that the Louisville Catalog and Plotner disclose all limitations of claims 8–16 except the bond limitation); PO Resp. 47 (arguing that the addition of the Werner Brochure to the combination does not cure the deficiencies Patent Owner identified in Petitioner’s Louisville Catalog and Plotner arguments).



The photo on the upper left depicts the entire ladder, the photo on the upper right shows an enlarged photo of the lower portion of the ladder, and the photo on the bottom shows an enlarged view of the bottom of one rail. Ex. 1004, 2; Pet. 9–10. The bottom of the ladder rail includes a “FULL METAL BOOT” on the lower portion of the ladder rails. *Id.* The text accompanying the photos describes the FULL METAL BOOT as “[a]luminum angle feet with thick slip resistant rubber tread. Reinforcement plates wrap around the rail for unsurpassed durability.” *Id.*

2. *Plotner*

Plotner discloses “[a] member for connecting a rail to a horizontal element of a ladder.” Ex. 1005, Abstract. The member includes first portion 30 connected to first horizontal step 104 and second portion 32 connected to ladder rail 102. *Id.* at 2:65–3:6. Second portion 32 includes integral and angled foot 38 that receives bottom 18 of side rail 102. *Id.* at 3:15–21, Figs. 2, 2d, 4, 5c, 6a, 6b. Plotner also discloses foot pad 40 attached to bottom 42 of foot 38. *Id.* at 3:26–30, Figs. 2, 2d, 4, 5c, 6a, 6b.

Plotner discloses various options for attachment of its invention to the bottom of the ladder rail. Plotner discloses members that fit within the inside of the rail or wrap around the outside of the rail. *See* Ex. 1005, 3:54–57, 5:22–26, Figs. 2b, 2c, 6a. In one embodiment, first and second arms connect to central body 75 to form a C-shaped cross section. *Id.* at 3:42–48. Those structures, in combination with second portion flange 79, define channel 81 that receives rail 102 on the outside of the C-shaped cross section. *Id.* at 3:51–57, Figs. 2b, 2c. A second embodiment includes guard section 60 positioned around the rail that extends around rail 102 to protect it. *Id.* at 5:19–26, Figs. 6a, 6c. A third embodiment discloses member 100 that connects to the inside of the rail using central body 75 and to a ladder shoe via shoe attachment portion 155. *Id.* at 8:58–65, 9:11–16, Figs. 8a, 8b, 9a, 9b, 9d.

3. *The Werner Brochure*

The Werner Brochure discloses a “T7200 PRO SERIES” ladder. Ex. 1006. A photo from the Werner Brochure is reproduced below.



The photo above shows the lower portion of the ladder rail in the Werner Brochure. Ex. 1006. The photo shows the ladder rail in yellow, and a “rail shield” in gray. *Id.* Also shown are five black protrusions extending upward from the bottom of the rail shield. *Id.* The photo also depicts a portion of a black tread under the bottom of the rail shield. *Id.*

4. *Independent Claim 8*

For purposes of this challenge to claim 8, Petitioner asserts that the Louisville Catalog discloses all of the claim limitations with the exception of the bond limitation. *See id.* at 14–18, 49. Petitioner also asserts that Plotner teaches all of the limitations of claim 8 with the exception of the bond limitation and the limitation requiring a tread material different from the

shell material, which Petitioner contends the Werner Brochure discloses and would have been obvious based on the Louisville Catalog. *See id.* at 21–29, 49. Petitioner contends that the Werner Brochure discloses the bond limitation and that one of ordinary skill in the art would have been motivated to combine the references to arrive at the claimed invention for a number of reasons. *Id.* at 49–54. Petitioner provides analysis of each limitation in claim 8, with citations to the references in question that correspond to each of the claim limitations. Pet. 14–18, 21–29, 49–54. Petitioner also cites to the relevant declarant testimony. *Id.* (citing various portions of Ex. 1010).

a. Limitations Disclosed by Louisville Catalog

We first address whether Petitioner establishes adequately that the Louisville Catalog discloses all of the limitations of claim 8 with the exception of the bond limitation. The preamble recites a “cover for an end of a ladder rail, the cover comprising.” Petitioner contends that the Louisville Catalog discloses a metal FULL METAL BOOT that “is a cover for the end of a ladder rail.” Pet. 14–15 (citing Ex. 1001, 3:51–53; Ex. 1004, 2; Ex. 1010 ¶ 106). The first limitation in the body of claim 8 requires “a shell formed of at least one material, said shell having a size suitable for engaging the ladder rail, said shell having a first wall with a pair of side walls extending from opposite ends thereof.” Petitioner contends that the FULL METAL BOOT includes a shell made of a first material (metal) “sized to engage the bottom of the ladder rail” and having a first wall and a pair of side walls extending from opposite sides of the first wall. Pet. 15 (citing Ex. 1004, 2; Ex. 1010 ¶ 107). Claim 8 also requires a “tread formed of at least one other material,” i.e., different than the “first material” of the shell. Petitioner alleges that the FULL METAL BOOT includes a “thick

rubber” tread “different from the metal from which the shell is formed.” Pet. 17 (citing Ex. 1004, 2; Ex. 1010 ¶ 109). Patent Owner does not address Petitioner’s arguments and evidence as to these portions of claim 8 or dispute that the Louisville Catalog discloses these limitations.⁶

We are persuaded by Petitioner’s arguments and evidence, and find that the Louisville Catalog discloses a “cover for an end of a ladder rail,” to the extent the preamble limits the claim, and “a shell formed of at least one material” that engages the rail, and has the claimed first wall and side walls, because the Louisville Ladder’s FULL METAL Boot includes these features. *See* Ex. 1004, 2; Ex. 1010 ¶¶ 106–07. We also find that the Louisville Catalog discloses a tread formed of “thick rubber” distinct from the metal shell, which satisfies the limitation requiring a “tread formed of at least one other material.” *See* Ex. 1004, 2; Ex. 1010 ¶ 109).

As noted above in the claim construction analysis, claim 8 also requires “an entirely open face opposite said first wall and between said pair of side walls, said open face suitable for exposing a portion of the ladder rail when the ladder rail and said shell are engaged” (the “entirely open face” limitation). Petitioner contends, with reference to the alleged similarity

⁶ In the circumstances where Patent Owner has chosen not to address or dispute Petitioner’s arguments and evidence, we view Patent Owner’s arguments as waived. *See In re Nuvasive, Inc.*, 841 F.3d 966, 974 (Fed. Cir. 2016) (“Although the Board did not make findings as to whether any of the other claim limitations (such as fusion apertures or anti-migration teeth) are disclosed in the prior art, it did not have to: Nuvasive did not present arguments about those limitations to the Board. . . . The Board, having found the only disputed limitations together in one reference, was not required to address undisputed matters.”); Paper 11, 6–7 (emphasizing that “any arguments for patentability not raised in the response may be deemed waived”).

between the '731 patent's Figure 3 and the FULL METAL BOOT, that the FULL METAL BOOT discloses an entirely open face opposite the first wall. Pet. 16 (citing Ex. 1001, Fig. 3; Ex. 1004, 2; Ex. 1010 ¶ 108). Patent Owner, relying on its proposed construction for "entirely open face," argues that the Louisville Catalog fails to disclose the limitation because its shell "includes a plate opposite the external wall and between a pair of side walls." PO Resp. 22. According to Patent Owner, the plate "severely restricts the inspection of the bottom ends of the ladder rail and, in fact, completely restricts almost the full width of the web portion of the ladder rail from view at the lowermost portion of the rail." *Id.* at 22–23 (citing Ex. 2002 ¶ 65); *see also* PO Sur-reply 12–14. Petitioner, in Reply, contends that the plate in the Louisville Catalog "is not even in the same plane as the face of the shell 'opposite said first wall,' and therefore cannot prevent the 'face' from being 'entirely open.'" Pet. Reply 12 (emphasis removed) (citing Ex. 2002 ¶ 65); *see also id.* at 13–14 (citing Pet. 16; Ex. 1001, Fig. 3; Ex. 1010 ¶¶ 58–59, 63; Ex. 1025, 75:6–76:13, 98:17–99:7, 100:1–3, 132:10–135:6, 136:16–137:9, 145:2–5).

Because Patent Owner premises its argument on a construction of "entirely open face" that we rejected above, we do not find Patent Owner's arguments convincing. We are persuaded by Petitioner's arguments and evidence, and find that the Louisville Catalog discloses a "an entirely open face opposite said first wall and between said pair of side walls, said open face suitable for exposing a portion of the ladder rail when the ladder rail and said shell are engaged." *See* Pet. 16; Pet. Reply 12–14. The Louisville Catalog discloses a shell with an entirely open face opposite the first wall between the side walls, exposing a portion of the ladder rail. *See, e.g.,* Ex.

1004, 2; Pet. Reply 12 (depicting open face with dotted lines). The claim requires nothing further.

Based on the foregoing, we find that Petitioner has established by a preponderance of the evidence that the Louisville Catalog discloses all of the limitations of claim 8 with the exception of the bond limitation.

b. Limitations Disclosed by Plotner

Petitioner asserts that Plotner discloses several of the same limitations of claim 8 as the Louisville Catalog.⁷ Pet. 21–29. For example, Petitioner alleges that Plotner discloses the “cover for an end of a ladder rail” in the preamble. Pet. 21–22 (citing Ex. 1001, 3:51–53; Ex. 1005, Figs. 1, 2, 3, 6, 8; Ex. 1010 ¶ 122). Petitioner also alleges that Plotner discloses “a shell formed of at least one material, said shell having a size suitable for engaging the ladder rail, said shell having a first wall with a pair of side walls extending from opposite ends thereof.” *Id.* at 22–24 (citing Ex. 1001, Fig. 3; Ex. 1005, 3:23–26, 3:41–50, 3:54–57, 5:19–24, Figs. 2b, 2c, 6a; Ex. 1010 ¶¶ 123–126, 128). Patent Owner does not address Petitioner’s argument and evidence as to these limitations of claim 8 or dispute that Plotner discloses these limitations. We are persuaded by Petitioner’s argument and evidence, and find that Plotner discloses a “cover for an end of a ladder rail” and “a shell formed of at least one material” that engages the rail and has the claimed first wall and side walls, because the structure

⁷ Although we already concluded that Petitioner met its burden in showing that the Louisville Catalog discloses all of the limitations of claim 8 with the exception of the bond limitation, we address several of these limitations again because Plotner’s disclosure of certain limitations of claim 8 bears on Petitioner’s combination of Plotner with the Louisville Catalog and the Werner Brochure, and the “entirely open face” issue is relevant to Petitioner’s challenge to claim 13.

shown and described in Plotner at the bottom of its ladder rails includes these features. *See* Ex. 1005, 3:23–26, 3:41–50, 3:54–57, 5:19–24, Figs. 1, 2, 2b, 2c, 3, 6a, 8; Ex. 1010 ¶¶ 122–126, 128.

Petitioner also contends that Plotner discloses two embodiments,⁸ shown in Plotner’s Figures 6b and 8a, which disclose the “entirely open face” limitation in claim 8. Pet. 24–26. Petitioner argues that these embodiments have shells that wrap around the outside of the ladder rail, exposing a portion of the interior of the ladder rail as required by the limitation. *See id.* at 24–25 (citing Ex. 1005, Figs. 6b, 8a; Ex. 1010 ¶ 128). Patent Owner argues that Petitioner mislabels Plotner’s Figure 6b, which does not expose any portion of the ladder rail. PO Resp. 30 (citing Pet. 24; Ex. 1005, Fig. 6b; Ex. 2003 ¶ 33). Patent Owner also argues that Petitioner misinterprets the shell in Plotner’s Figure 8a, which “completely covers” the ladder rail. *Id.* at 31–32 (citing Pet. 25; Ex. 1005, 5:46–47, 5:48–49, Fig. 8a; Ex. 2003 ¶ 35).

In its Reply, Petitioner acknowledges that the embodiment of Figure 6b includes incorrect numeric labels applied by Plotner, but argues that “[b]ased on common sense, one of ordinary skill in the art would have interpreted Figure 6b like Mr. Ver Halen did.” Pet Reply 19–20. As to the embodiment of Plotner’s Figure 8a, Petitioner argues that the supports used in that embodiment expose at least a portion of the lower ladder rail. *Id.* at 17–19 (citing Ex. 1001, 6:64–66; Ex. 1005, 8:61–63, 9:11–16, Figs. 8a, 9a–9e; Ex. 1026, 159:6–160:18, 160:20–162:21, 169:22–172:9). Petitioner also

⁸ Petitioner relies on a third embodiment in the Petition based on Plotner’s Figure 2c, but does not maintain that argument in its Reply, and we need not reach that argument.

refers to a third embodiment, shown in Figures 2e and 5f, that expose a portion of the ladder rail via a window similar to that described by the '731 patent. *Id.* at 18–19 (citing Ex. 1001, 6:64–66; Ex. 1005, Figs. 2e, 5f). Petitioner asserts that, given these teachings, viewed together with the Louisville Catalog, the references teach “exposing a portion of the ladder rail using a cover shell with an entirely open face,” and that it would have been obvious to do so. *Id.* at 19–20 (citing Paper 1, 24–25, 47; Ex. 1010 ¶¶ 127, 128, 171).

In its Sur-reply, Patent Owner argues that the supports shown in Plotner’s Figures 9a–9e “significantly cover the interior of the ladder rail,” and the other options for “cutouts” do not show the bottom end of the rail. PO Sur-reply 19–21 (citing Paper 19, 17–19, 25; Ex. 1005, Figs. 2e, 5f, 8a, 9d). Patent Owner also argues that its interpretation of Plotner’s 6b is more reasonable and supported than Petitioner’s interpretation. *Id.* at 20–21 (citing Ex. 1005, 5:19–25, 6:30–53, Figs., 2–2f, 3a–3h, 6b).

We are persuaded by Petitioner’s arguments and evidence, and find that Plotner discloses the entirely open face limitation in claim 8. As to the embodiment shown in Plotner’s Figure 8a, we agree with Petitioner that Plotner contemplates using the supports shown in Figures 9a–9e in the Figure 8a embodiment. *See* Ex. 1005, 9:11–16 (“As shown in FIG. 8a, . . . a first rail member 28e and a second rail member 28f are used to provide further support. The first rail member 28e and second rail member 28f are preferably of a configuration as described above and shown in FIGS. 9a–9e.”). We also agree with Petitioner that employing the supports of Figures 9a–9e will expose a portion of the interior of the ladder rail. *See id.* at Figs. 9a, 9d; Pet. Reply 17. Patent Owner seems to acknowledge that some

portion of the ladder rail would be exposed if such supports are used, but argues that more must be exposed to meet the claim limitation. PO Sur-reply 19–20. We disagree. We did not adopt Patent Owner’s claim construction for the entirely open face limitation, and as long as some portion of the ladder rail is exposed by the entirely open face, even if not the lowermost portion of the rail or a majority of the interior of the rail, the limitation is disclosed. For similar reasons, we view the exposure of the interior of the ladder rail through the cutouts or windows shown in Plotner’s Figures 2e and 5f as sufficient to meet the limitation as well. *See* Ex. 1005, Figs. 2e, 5f; Ex. 1001, 6:64–66 (describing similar “removed portion” or “window” exposing the rail in the context of the ’731 patent); Pet. Reply 18–19. We also find Petitioner’s explanation of Plotner’s Figure 6b persuasive, and although labelling errors create some confusion, a person of ordinary skill in the art would understand that Figure 6b shows an exposed ladder rail on the interior of the rail, as explained by Mr. Ver Halen. *See* Pet. Reply 19–20; Ex. 1010 ¶ 127.

c. Bond Limitation Disclosed by the Werner Brochure

Petitioner contends that the Werner Brochure discloses the bond limitation—“at least one bond, said at least one bond comprising at least a portion of said shell and at least a portion of said tread.” Pet. 49. Petitioner relies on the photo in the Werner Brochure showing “black studs extending through the base of each ladder foot.” *Id.* at 49–50 (citing Ex. 1006; Ex. 1010 ¶¶ 181–182). According to Petitioner, one of ordinary skill in the art would have understood that the black studs are not mechanical fasteners, and are integral with the tread below the shell, because (1) the “studs extend significantly above the top surface of the shell base,” unlike fasteners

typically having flat heads; and (2) there are six studs, far more than typically present when fasteners are used. *Id.* at 50–51 (citing Ex. 1010 ¶ 183). Petitioner further contends that “[t]he studs enable the tread to be removed with force for replacement purposes, but during normal operation they secure the tread to the shell and prevent any of the edges to be lifted or separated from the shell.” *Id.* at 51 (citing Ex. 1010 ¶ 183). Petitioner also contends that “[t]he studs would have been formed when the tread was made, probably using injection molding, and they are sized to fit through holes in the base of each foot and to hold the tread securely in place.” *Id.*

Patent Owner argues that “the Werner Brochure does not clearly depict the bond, if any, that is used” to secure its tread to its shell. PO Resp. 49 (citing Ex. 2003 ¶ 67). Patent Owner also argues that Mr. Ver Halen “cannot be sure” of the bond used, and admits that the photo partially obscures the alleged studs. *Id.* (citing Ex. 1010 ¶ 99). According to Patent Owner, “[i]t is entirely unclear from the photos in the Werner Brochure whether the black studs in the images” meet the requirements of the bond limitation. *Id.* (citing Ex. 2003 ¶ 67). Patent Owner further argues that “it is not even clear whether the ‘black studs’ identified in Werner Brochure are integral with the tread of the foot pad shown in the Werner Brochure.” *Id.* Even if the black studs are integral with the foot pad in the Werner Brochure, Patent Owner contends that the connection would still fail to meet the claim requirement that the bond include a portion of the shell and a portion of the tread. *Id.* at 50 (citing Ex. 2003 ¶ 68). Patent Owner argues that merely pressing the black studs through a hole and maintaining a connection through friction, for example, would not be the type of

“interlocking bond” described in the Specification that includes a portion of the shell and tread. *Id.* at 50–51 (citing Ex. 1001, 7:30–42; Ex. 2003 ¶ 68).

In its Reply, Petitioner argues that “Mr. Ver Halen’s testimony is detailed and reliable,” and addressed the content of the photos, known bonding techniques, and specific reason why the black studs are integral with the tread. Pet. Reply 25–26 (citing Ex. 1010 ¶¶ 181–186). Petitioner also contends that Patent Owner reads in limitations from the Specification, such as the specific interlocking bond formed by overmolding plastic, which goes beyond the claim requirements. *Id.* at 26–27 (citing Paper 12, 50–51; Ex. 1001, 11:59–63, 11:67–12:1, 12:64–13:24, 18:42–45).

In its Sur-reply, Patent Owner argues that it does not seek to read in limitations from the Specification, and overmolding is just one method of producing a physical means of engagement. PO Sur-reply 27. Patent Owner maintains that the Werner Brochure lacks the required physical engagement if the black studs are merely pressed into place and mere friction holds the two pieces in place. *Id.*

As discussed above, we adopt Patent Owner’s proposed construction for the bond limitation —“at least one means of chemical and/or physical engagement, said at least one engagement means comprising at least a portion of said shell and at least a portion of said tread.” As Patent Owner stated in its Sur-reply, and then again at the oral hearing, it does not seek to alter this construction by reading in further approaches from the Specification. *See* PO Sur-reply 26–27; Tr. 30:16–21. Accordingly, the issue is whether the Werner Brochure employs physical engagement means that includes a portion of both the shell and tread because Petitioner does not

assert that the Werner Brochure employs a chemical engagement mechanism.

We are persuaded by Petitioner’s argument and evidence that the Werner Brochure discloses black studs integral with the tread, that the black studs are not fasteners, and that the black studs perform the function of retaining the tread on the shell using physical engagement. *See* Pet. 49–51; Pet. Reply 25–26. We credit Mr. Ver Halen’s detailed explanation of why one of ordinary skill in the art would have interpreted the Werner Brochure in that manner over the competing testimony of Mr. Quan, who merely repeated Patent Owner’s assertion that the Werner Brochure was too unclear. *See* Ex. 1010 ¶¶ 182–183; Ex. 2003 ¶¶ 67–68. We are also persuaded that the Werner Brochure discloses the necessary “physical engagement” even if it merely relies upon a friction fit between the tread and shell, contrary to Patent Owner’s assertions. We again credit Mr. Ver Halen’s description of the studs as “sized to fit through the holes in the base of each foot and to hold the tread securely in place.” Ex. 1010 ¶ 183; *see also id.* at ¶ 187 (“The tread may simply be pressed to the bottom of the shell until the studs pop through the holes in the shell.”). Even if such an interaction relies on friction to hold the tread and shell together, it necessarily relies on physical interaction between a portion of both the tread and shell in order to remain secured in place, satisfying that aspect of the claim language and our construction of the claimed “bond.” Patent Owner suggests that something more is required, and hints that a bond with more “interlocking” aspects is required, but neither the claim language nor Patent Owner’s own proposed construction, which we adopted and which Patent Owner does not seek to alter, requires some sort of *interlocking* physical engagement that goes

beyond the forcing tread studs through the shell holes with a friction fit. To the extent that Patent Owner seeks to have us construe our construction by narrowly defining “physical engagement” to only certain types of interlocking engagements, physical engagement, we decline to do so.⁹

Based on the foregoing, we find that Petitioner has established that the Werner Brochure teaches or suggests, and at a minimum renders obvious, the claimed “bond.”

5. *Independent Claim 10*

Claim 10 includes many of the same limitations as claim 8, and for those limitations, Petitioner’s arguments and evidence track those addressed above in the context of claim 8. *See* Pet. 18–20, 31–36, 49. For example, Petitioner asserts that the Louisville Catalog discloses the same preamble, “shell” limitation,¹⁰ and “tread formed of at least one other material” limitations in claim 10 for the same reasons as claim 8. *Id.* at 18–20. Petitioner also asserts that Plotner discloses the preamble and shell limitation for the same reasons discussed above, and relies on the Werner Brochure for the bond limitation in the same manner for all claims. *Id.* at 31, 49. With the exception of the bond limitation arguments we addressed and rejected

⁹ Patent Owner’s attempt to read “interlocking” into its construction also begs the question of how much interlocking engagement is necessary. Forcing black studs through a hole smaller than the studs so that they pop out the other side and retain the tread on the shell, as Mr. Ver Halen describes, would fall within an ordinary mean of “interlocking.” *See* Ex. 1010 ¶¶ 183, 187.

¹⁰ The shell limitation common to both claim 8 and claim 10 includes the following language: “a shell formed of at least one material, said shell having a size suitable for engaging the ladder rail, said shell having a first wall with a pair of side walls extending from opposite ends thereof.” Ex. 1001, 17:12–15, 17:29–32.

above, Patent Owner does not address Petitioner's argument and evidence as to these portions of claim 10 or dispute that the references disclose these limitations. For the same reasons discussed above addressing the same limitations in claim 8, we find that Petitioner has established that the Louisville Catalog and Plotner disclose the preamble and shell limitation common to both claims, the Louisville Catalog discloses a "tread formed of at least one other material," and the Werner Brochure discloses the bond limitation.

Claim 10 differs from claim 8 in that it does not include an "entirely open face" limitation and adds the following "rail flange retainer" limitation:

said shell further comprising: a rail flange retainer extending upwardly from a bottom of said shell and disposed adjacent at and in parallel relation to said first wall, said rail flange retainer being sized to engage the ladder rail between said rail flange retainer and the wall and being sized to expose a lower portion of the ladder rail when the ladder rail is engaged between the first wall and said rail flange retainer.

Ex. 1001, 17:32–41. Petitioner argues that both the Louisville Catalog and Plotner discloses the rail flange retainer limitation. Pet. 19–20, 32–35. As to the Louisville Catalog, Petitioner contends that the FULL METAL BOOT includes rail flange retainers that extend upwardly from the bottom of its shell and expose a lower portion of the ladder rail as required by the limitation. *Id.* at 19–20 (citing Ex. 1004, 2; Ex. 1010 ¶ 117). Petitioner points to rail flange retainers parallel to the first wall in the FULL METAL BOOT shown in the Louisville Catalog, which hold the bottom of the rail between the retainers and the first wall. *See id.* Patent Owner argues that Petitioner improperly relies on a two-piece metal shell, leaving a small gap between the bottom of the rail flange retainers and the bottom/base of the shell. PO Resp. 27–28 (citing Pet. 19; Ex. 1004, 2; Ex. 1010 ¶ 107; Ex.

2002 ¶ 75). According to Patent Owner, this gap shows that the rail flange retainers “are not integral with the bottom of the shell and do not extend upwardly from a bottom of the shell in the Louisville Catalogs.” *Id.* at 28 (citing Ex. 2002 ¶ 76); *see also* PO Sur-reply 17–18.

Because Patent Owner premises its argument on the adoption of its proposed “integral” construction for the “rail flange retainer extending upwardly” limitation, which we rejected above, we are not persuaded by Patent Owner’s argument that the Louisville Catalog’s FULL METAL BOOT fails to disclose the limitation because the rail flange retainers are not integral with its base. *See* PO Resp. 27–28; Pet. Reply 16; PO Sur-reply 17–18. We are persuaded by Petitioner’s argument and evidence, and find that the Louisville Catalog discloses the rail flange retainer limitation. *See* Pet. 19–20; Ex. 1004, 2; Ex. 1010 ¶ 117. We need not determine whether Plotner also discloses the limitation as Petitioner asserts. *See* Pet. 32–35; Pet. Reply 21.

Claim 10 also requires “said bottom of said shell defining a perimeter, said rail flange retainer positioned substantially inwardly of an edge of said perimeter opposite said first wall.” Petitioner contends that the Louisville Catalog positions its rail flange retainers “substantially inwardly of the edge of the perimeter opposite the first wall of the FULL METAL BOOT.” Pet. 20 (citing Ex. 1004, 2; Ex. 1010 ¶ 118). As Petitioner puts it, the FULL METAL BOOT rail flange retainers “are recessed from the edge of the shell.” *Id.* In its Patent Owner Response, Patent Owner does not separately address Petitioner’s assertion that the Louisville Catalog discloses this limitation, or contest Petitioner’s arguments and evidence on this point. *See* PO Resp. 27–28 (limiting dispute as to the Louisville Catalog to the rail

flange retainer limitation addressed above). Petitioner noted the lack of any dispute on this point in its Reply. *See* Pet. Reply 23 (“Louisville does not dispute that the Louisville Catalogs showed rail flange retainers that were positioned substantially inwardly of the edge of the base opposite the first wall.”). In its Sur-reply, Patent Owner argues for the first time that the Louisville Catalog’s FULL METAL BOOT does not disclose this limitation. *See* PO Sur-reply 24–25.

Patent Owner’s arguments made for the first time in its Sur-reply are waived because they were not made in the Patent Owner Response, and Petitioner relied on their absence to its detriment and was deprived of the chance to present arguments and evidence in its Reply to rebut Patent Owner’s assertions. *See* Paper 11, 6–7 (emphasizing that “any arguments for patentability not raised in the response may be deemed waived”); Pet. Reply 23 (noting Patent Owner’s lack of dispute on this issue).

Even if Patent Owner did not waive its argument, we are persuaded by Petitioner’s arguments and evidence, and find that the Louisville Catalog’s FULL METAL BOOT discloses a “bottom of said shell defining a perimeter, said rail flange retainer positioned substantially inwardly of an edge of said perimeter opposite said first wall.” Neither party proposed a formal construction for the “substantially inwardly” limitation, supported by intrinsic or extrinsic evidence. Further, the Specification of the ’731 patent does not define or use the term “substantially inward.” At most, the Specification provides examples in its figures of approximate distances the rail flange retainers are disposed away from the perimeter of the shell, which presumably fall within the scope of “substantially inwardly.” *See* Ex. 1001, Figs. 3, 8, 9, 14. These examples, however, do not define the minimum

distance necessary to fall within the scope of the claim term. At the oral hearing, Patent Owner's counsel was unaware of any function the "substantially inward" requirement served. Tr. 43:22–25. Given this lack of guidance from the intrinsic and extrinsic record and the parties' briefing, we decline to limit "substantially inwardly" to any distance shown in the figures, or any other fixed distance. When applied to the Louisville Catalog's FULL METAL BOOT, we agree with Petitioner that the rail flange retainers are positioned substantially inwardly from the edge of the shell perimeter because the retainers are noticeably recessed from that edge. *See* Pet. 20; Ex. 1004, 2; Ex. 1010 ¶ 118. We note that Petitioner's declarant testimony remains unrebutted on this issue, even if we considered Patent Owner's argument in its Sur-reply. *See* PO Sur-reply 24–25 (not citing any declarant testimony); Tr. 43:15–21 (Patent Owner acknowledging its experts did not address the meaning of the term). We find the testimony of Mr. Ver Halen credible on this point. We do not determine whether Plotner also discloses this limitation.

Based on the foregoing, Petitioner has established that the combination of the Louisville Catalog and the Werner Brochure (with or without the addition of Plotner) discloses all of the limitations of claim 10.

6. *Dependent Claims 9 and 11*

Dependent claims 9 and 11 depend from independent claims 8 and 10, respectively, and further require a shell having "a base including a slanted portion." Ex. 1001, 17:25–26, 17:50–51. Petitioner argues that both the Louisville Catalog and Plotner discloses a shell base with a slanted portion. Pet 18, 21, 29–31, 36. As to Plotner, Petitioner argues that it was well known to employ slanted bases on ladders because the "ladder rails do not

stand at a perfect vertical during operation” and the slanted base allows the base or tread to lie flat during use. Pet. 29 (citing Ex. 1010 ¶ 135).

Petitioner asserts that the base can be slanted from right to left or front to rear, or both, to accommodate angled ladder rails, and that Plotner discloses both approaches. *Id.* at 29–30 (citing Ex. 1005, Figs. 2d (depicting left to right slant to accommodate ladder rails that are wider on bottom than on the top, such as most stepladders), 2e (depicting front to rear slant); Ex. 1010 ¶¶ 136–138). Petitioner also relies on Plotner’s disclosure of specific slant angles for its shell base. *Id.* at 30 (citing Ex. 1005, 9:36–60, Figs. 11a, 12a; Ex. 1010 ¶ 139). Petitioner argues that it would have been obvious to incorporate the slanted base on embodiments that do not depict a slanted base. *Id.* at 31 (citing Ex. 1010 ¶ 140). Patent Owner argues that Petitioner’s arguments based on the Louisville Catalog lack merit, but does not address or otherwise dispute Petitioner’s argument and evidence as to Plotner’s disclosure of a slanted base. *See* PO Resp. 26–27 (addressing Louisville Catalog).

We are persuaded by Petitioner’s arguments and evidence, and find that Plotner discloses a shell base with a slanted portion, for the reasons set forth by Petitioner. *See* Pet. 29–31; Ex. 1005, Figs. 2d, 2e, 11a, 12a; Ex. 1010 ¶¶ 135–140. We do not reach whether the Louisville Catalog also discloses this limitation.

7. *Claims 12–16*

Independent claims 12 and 14 and dependent claims 13, 15, and 16 overlap in many respects with the claims addressed above. Petitioner asserts that the combination of the Louisville Catalog, Plotner, and the Werner Brochure discloses all of the limitations of these claims. *See* Pet. 37–45, 49–

52. Patent Owner does not raise any additional arguments with respect to the limitations in these claims. Instead, Patent Owner argues that the references fail to disclose the bond limitation (found in all claims) and the entirely open face limitation (claim 13), which we addressed above.

Independent claims 12 and 14 begin with the same preamble as claims 8 and 10 and the same portion of the following shell limitation: “a shell formed of at least one material, said shell having a size suitable for engaging the ladder rail.” Ex. 1001, 18:1–4, 18:24–27. Petitioner argues that both the Louisville Catalog and Plotner disclose these limitations for the same reasons discussed above in the context of claim 8. *See* Pet. 14–15, 21–24, 37, 41–42. Petitioner also argues that the Louisville Catalog discloses “a tread formed of at least one other material and the bond limitation,” for the same reasons as addressed above in the context of claim 8. *See id.* at 38, 43, 49. Patent Owner does not address or dispute Petitioner’s arguments and evidence in support of Petitioner’s contention that both the Louisville Catalog and Plotner disclose these limitations, with the exception of Patent Owner’s arguments as to the bond limitation, which we addressed above. For the same reasons set forth above, we find that the Louisville Catalog discloses the preamble, the shell limitation, and the tread; Plotner discloses the preamble and shell limitation; and the Werner Brochure discloses the bond limitation.

Claim 12 includes the following limitations that do not appear in the other claims:

said shell having a base with a slanted portion, said base having a lower surface, said slanted portion comprising at least a portion of said lower surface, said shell further comprising:
a perimeter wall; and

a cavity defined by said perimeter wall and said lower surface of said base, said cavity positioned beneath said lower surface of said base of said shell

...

said cavity receiving a portion of said tread therein, a volume of said cavity being increased by said slanted portion of said base.

Ex. 1001, 18:4–12, 18:17–19. Petitioner argues that Plotner discloses a shell having a slanted portion for the same reasons Petitioner set forth in the context of claim 9. Pet. 37 (citing Ex. 1010 ¶¶ 151–153). Petitioner also argues that Plotner discloses foot 38 having a perimeter wall that extends downward to define a cavity below lower surface 42 of foot 38. *Id.* at 37–38 (citing Ex. 1005, Figs. 1, 4; Ex. 1010 ¶ 154). As to the limitation requiring the cavity to receive a portion of the tread and the slanted portion to increase the volume of the cavity, Petitioner argues that Plotner discloses the cavity with and without tread 40 installed, and that the slanted portion increases the available cavity volume in the same manner as the slanted portion disclosed in the Specification. *Id.* at 39–40 (citing Ex. 1001, 10:7–9, Fig. 6; Ex. 1005, 3:29–30, Figs. 1, 4; Ex. 1010 ¶¶ 156–158). Patent Owner does not address or dispute Petitioner’s arguments and evidence on these points. We are persuaded by Petitioner’s arguments and evidence, and find that Plotner discloses the claimed shell having a slanted portion and cavity as required by claim 12. *See* Ex. 1005, 3:29–30, Figs. 1, 4; Ex. 1010 ¶¶ 154, 156–158.

Claim 14 includes the following limitations that do not appear in the other claims:

said shell having a skirt extending downwardly therefrom

...

said skirt covering at least another portion of said tread, said skirt having a lower edge in generally parallel spaced relation with a

bottom of said tread and positioned above said bottom of said tread.

Ex. 1001, 18:27–28, 18:33–36. Petitioner argues that Plotner’s foot 38 includes a downwardly extending perimeter wall that defines a skirt and receives a tread, with the lower edge of the skirt generally parallel to and spaced from the bottom of the tread. Pet. 42–43 (citing Ex. 1005, Figs. 1, 4, 6a, 8a; Ex. 1010 ¶¶ 161–162, 164). Patent Owner does not address or dispute Petitioner’s arguments and evidence on these points. We are persuaded by Petitioner’s arguments and evidence, and find that Plotner discloses the claimed skirt covering a portion of the tread, with the lower edges of each in generally parallel and spaced relation to one another as required by claim 14. *See* Ex. 1005, Figs. 1, 4, 6a, 8a; Ex. 1010 ¶¶ 161–162, 164.

Claim 13 depends from claim 12 and further requires that the shell “defines an entirely open face so that a portion of the ladder rail is exposed through the entirely open face when the ladder rail and said shell are engaged.” Petitioner argues that both the Louisville Catalog and Plotner disclose the “entirely open face” limitation.¹¹ Pet. 16, 24–26, 41. Relying

¹¹ Petitioner raises the Louisville Catalog argument in the context of claim 8, but mentions it again in the context of claim 13 and the challenge based on the Louisville Catalog, Plotner, and the Werner Brochure broadly refers back to Petitioner’s earlier contentions in its challenges to claims 8–16. *See* Pet. 49; Pet. Reply 19–20. We view Petitioner’s challenge to claim 13 based on the Louisville Catalog, Plotner, and the Werner Brochure as including reliance upon the Louisville Catalog (and Plotner) as disclosing the “entirely open face” limitation in claim 13. Patent Owner fully briefed the issue of claim construction and whether the Louisville Catalog discloses this limitation in the context of claim 8, and the same arguments apply to the slightly broader version of the limitation in claim 13. *See* PO Resp. 2, 13–17, 21–24, 30–33; PO Sur-reply 5–10, 12–15, 18–22.

on its proposed claim construction, Patent Owner argues that both the Louisville Catalog and Plotner fail to disclose the claimed “entirely open face.” PO Resp. 21–24, 30–33. As discussed above, we decline to adopt Patent Owner’s proposed construction of “entirely open face” and find that the Louisville Catalog and multiple embodiments in Plotner disclose an entirely open face that exposes a portion of the ladder rail when the ladder rail and shell are engaged, as required by claim 8. The references disclose claim 13’s “entirely open face” limitation because that limitation, while very similar to claim 8, does not require “opposite said first wall and between said pair of side walls” and is therefore broader than claim 8 in that respect. Accordingly, we apply the same reasons we found that the Louisville Catalog and Plotner disclose the entirely open face limitation of claim 8 to claim 13.

Claim 15 depends from claim 14 and further requires a tread having “at least one color that is different than at least one color of said shell.” Petitioner argues that the Louisville Catalog depicts a silver metal shell and black rubber tread that satisfies the limitations of claim 15. Pet. 44 (citing Ex. 1004, 2; Ex. 1010 ¶¶ 165, 177). Patent Owner does not address or dispute Petitioner’s arguments and evidence on these points. We are persuaded by Petitioner’s arguments and evidence, and find that the Louisville Catalog discloses the claimed tread having “at least one color that is different than at least one color of said shell.” *See* Ex. 1004, 2; Ex. 1010 ¶¶ 165, 177.

Claim 16 depends from claim 14 and further requires “a mechanical fastener engageable with said tread and said shell.” Petitioner argues that the Louisville Catalog discloses using rivets, which are mechanical

fasteners, “to bond the tread to the shell of the FULL METAL BOOT.” Pet. 45 (citing Ex. 1001, 2:19–22; Ex. 1010 ¶¶ 166–167, 178). Patent Owner does not address or dispute Petitioner’s arguments and evidence on these points. We are persuaded by Petitioner’s arguments and evidence, and find that the Louisville Catalog discloses the claimed mechanical fastener engaging the tread and the shell. *See* Ex. 1004, 2; Ex. 1010 ¶¶ 166–167, 178.

Based on the foregoing, we find that the combination of the Louisville Catalog, Plotner, and the Werner Brochure discloses all of the limitations of claims 8–16.

8. *Combination*

As to the reason to combine the Louisville Catalog and Plotner, Petitioner argues that one of ordinary skill in the art would naturally have looked to designs from two of the largest ladder manufacturers when “looking for features to mitigate wear and tear in a commercial ladder.” Pet. 45–46 (citing Ex. 1010 ¶¶ 168–171). Petitioner also asserts that the general features, such as ladder rail covers, shells, and treads, “were generally interchangeable” and combining them as Petitioner proposes “would have involved routine application of known ladder features” with “predictable results.” *Id.* at 46 (citing Ex. 1010 ¶ 170). As to the addition of the Werner Brochure to the combination, Petitioner argues that it, like Plotner, comes from one of the largest ladder suppliers and, like the Louisville Catalog and Plotner, would have been considered by one of ordinary skill in the art for design features that would mitigate wear and tear. *Id.* at 52 (citing Ex. 1006; Ex. 1010 ¶ 186; Ex. 1011 ¶¶ 9–10). Petitioner also argues that it “would have been a simple substitution of the tread with studs from the Werner

brochure in place of the rivets of the Louisville Catalogs.” *Id.* (citing Ex. 1010 ¶ 187). Petitioner relies on several motivations for the addition of the studs in the Werner Brochure tread, including cost reduction, ease of assembly, and ease of tread replacement. *Id.* at 52–53 (citing Ex. 1010 ¶ 187).

As to the Louisville Catalog/Plotner combination, Patent Owner argues that Plotner discloses a ladder with an improved knee brace and “has no relevance to the ’731 patent.” PO Resp. 28–29 (citing Ex. 1005, 1:13–20, 1:23–40; Ex. 2003 ¶ 31). Patent Owner also asserts that “Plotner is far afield from the disclosure of the Louisville Catalogs.” PO Resp. 42 (citing Ex. 2003 ¶ 56). Patent Owner asserts that Plotner’s “primary object . . . is to provide a ladder that has a member connected to both the ladder rail and the first step in order to support the first step.” *Id.* (citing Ex. 1005, Abstract; Ex. 2003 ¶ 56). This “improved knee brace” of Plotner, according to Patent Owner, distinguishes Plotner’s primary purpose from the Louisville Catalog’s FULL METAL BOOT, which does “not address providing support to the first step of the ladder” and instead focused on “durability and sure footing.” *Id.* at 42–43 (quoting Ex. 1002, 10) (citing Ex. 1005, 1:41–48, Figs. 1, 2-2f, 3-3F; Ex. 2003 ¶¶ 56–57). Patent Owner also argues that combining the references would render Plotner unsuitable for its intended purpose, a knee brace. *Id.* at 43–44 (citing Ex. 2003 ¶¶ 57–59; MPEP 2143.01(VI)). Patent Owner also views Petitioner’s stated reasons for the combination as lacking and driven by hindsight, with a failure to establish a reasonable expectation of success. *Id.* at 45–47 (citing Pet. 46–47; Ex. 1010 ¶ 133; Ex. 2003 ¶¶ 60–63). As to the addition of the Werner Brochure to the combination, Patent Owner relies on the same arguments made against the

combination of the Louisville Catalog and Plotner. *See id.* at 51–52 (citing Ex. 2003 ¶¶ 54–63, 69).

In its Reply, Petitioner argues that Patent Owner concedes that the three references teach the majority of claim limitations in an overlapping manner, and one of ordinary skill in the art “would have known that Plotner was relevant to ladder rail covers and that its teachings could be combined with similar and complementary features from the Louisville Catalogs.” Pet. Reply 23 (citing Pet. 45–48; Ex. 1010 ¶¶ 33, 95, 168–171). Petitioner also argues that Patent Owner’s argument that Plotner’s knee brace renders it incompatible with the Louisville Catalog’s FULL METAL BOOT is belied by the fact that Plotner discloses rail guards “remarkably similar to the FULL METAL BOOT, and like Plotner the Louisville Catalogs show a knee brace to support the bottom step.” *Id.* at 24 (citing Paper 12, 43–44; Ex. 2003 ¶¶ 58–59). Petitioner further contends that even if “the FULL METAL BOOT features were unsuitable for use with Plotner’s knee brace” other features, such as those in the challenged claims, could have been combined. *Id.*

In its Sur-reply, Patent Owner argues that the overlapping features of the references are not enough to provide a reason for the proposed combination. PO Sur-reply 25 (citing Ex. 2003 ¶¶ 56–57). Patent Owner also stresses that the FULL METAL BOOT was not located anywhere near the knee brace that was the focus of Plotner, and that one “looking to modify the knee brace of Plotner would not have looked to the Louisville Catalogs.” *Id.* at 26–27 (citing Ex. 1005, 1:17–20; Ex. 2003 ¶¶ 56–57, 62). Patent Owner further argues that the proposed modifications “would require a substantial reconstruction” of Plotner’s supporting members, which “would

undermine Plotner’s stated purpose of providing support to a first step of a ladder.” *Id.* (citing Ex. 2003 ¶ 58).

We disagree with Patent Owner’s assertion that Plotner “has no relevance to the ’731 patent” merely because it discloses a brace for strengthening the horizontal first step of a ladder. PO Resp. 29. We are persuaded by Petitioner’s argument, supported by credible testimony from Mr. Ver Halen, that one of ordinary skill in the art would have considered Plotner together with the other references when considering features for shells and treads at the bottom of the ladder rail. Pet. 45–46; Ex. 1010 ¶¶ 168–171. Patent Owner focuses heavily on the knee brace Plotner discloses, but virtually ignores Plotner’s descriptions of various shell structures at the bottom of the ladder rails that serve the same purposes as the Louisville Catalog’s FULL METAL BOOT. *See* Ex. 1010 ¶ 169; Ex. 1005, Figs. 2, 6a, 8a. Plotner devotes considerable content to descriptions of aspects of the “second portion 32” of its member 100 that attaches to the bottom of the ladder rail in a number of embodiments—it does not focus exclusively on the “first portion 30” that attaches to the first step as Patent Owner suggests. *See, e.g.*, Ex. 1005, 2:65–3:33, 5:19–26, 6:30–53, 8:58–65. The failure to acknowledge and address these overlapping approaches to similar problems, as if Plotner only cared about supporting the first step of the ladder, undermines the credibility of Patent Owner’s arguments, including its argument that features of Plotner’s shell and tread on the end of its ladder rail would not have been suitable for combination with features from the Louisville Catalog’s FULL METAL BOOT shell and tread.

We are persuaded by Mr. Ver Halen’s testimony that the general features, such as ladder rail covers, shells, and treads, “were generally

interchangeable within the knowledge and abilities of those of ordinary skill in the art at the time.” Ex. 1010 ¶ 170. Patent Owner’s declarant Mr. Quan states that the combination would require modifications that may lessen the capabilities of Plotner’s knee brace, rendering it unsuitable for its intended purposes, but such broad statements do not imply that Plotner would be rendered unsuitable. *See* Ex. 2003 ¶ 58. Instead, they suggest, at most, that one of skill in the art would need to weigh any potential advantages when incorporating aspects of the Louisville Catalog FULL METAL BOOT, which could potentially lower the ability to support the first step of the ladder. *See id.*; *see also Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (“The fact that the motivating benefit comes at the expense of another benefit . . . should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.”). On the whole, we credit the testimony of Mr. Ver Halen because it is more consistent with Plotner’s disclosure, and we find that Petitioner has established by a preponderance of the evidence that one of ordinary skill in the art would have had a reason to combine the Louisville Catalog, Plotner, and the Werner Brochure.

9. Conclusion

“Once all relevant facts are found, the ultimate legal determination [of obviousness] involves the weighing of the fact findings to conclude whether the claimed combination would have been obvious to an ordinary artisan.” *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1361 (Fed. Cir. 2017) (citing *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)).

Above, based on full record before us, we provide our factual findings regarding (1) the level of ordinary skill in the art, (2) the scope and content of the prior art, (3) any differences between the claimed subject matter and the prior art, and (4) objective evidence of nonobviousness.

In particular, we find that (1) Patent Owner’s proposed level of ordinary skill in the art is consistent with the art of record; (2) the asserted references teach all the limitations of claims 8–16; (3) one of ordinary skill in the art would have had a reason to combine the identified components in the Louisville Catalog, Plotner, and the Werner Brochure, with a reasonable expectation of success; and (4) there is no persuasive objective evidence of nonobviousness in the record. Weighing these underlying factual determinations, a preponderance of the evidence persuades us that claims 8–16 of the ’731 patent are unpatentable over Louisville Catalog, Plotner, and the Werner Brochure.

E. Obviousness of Claims 19 and 20 Based on Plotner, the Louisville Catalog, the Werner Brochure, and the Modern Plastics Handbook

Petitioner challenges claims 19 and 20 under 35 U.S.C. § 103(a) based on the Louisville Catalog, Plotner, the Werner Brochure, and the Modern Plastics Handbook. Pet. 14, 54–65. Claims 19 and 20 both depend from independent claim 14. Ex. 1001, 18:46–49. Claim 19 requires the “at least one other material” of the shell to comprise a “copolymer,” while claim 20 requires the “at least one other material” of the tread to comprise a “thermoplastic elastomer.” *Id.*

Petitioner argues that Plotner and the Werner Brochure disclose a shell made of plastic, and one of ordinary skill in the art considering various plastics at the time of invention would have found it obvious to use a

copolymer. Pet. 55–59. Petitioner supports its argument with reference to the Modern Plastics Handbook as well as the Ver Halen Declaration. *See id.* (citing Ex. 1007, 1.40, 1.60–1.63, 8.13–8.16; Ex. 1010 ¶¶ 101, 191–202). As to claim 20, Petitioner argues that the Louisville Catalog discloses a “rubber” material for its tread, the Werner Brochure teaches an injection molded tread with integrated studs, and another reference, a Werner Catalog,¹² discloses the use of “polyvinyl feet,” which are thermoplastic polymers. *Id.* at 60–61. Petitioner also supports its argument with references to the Modern Plastics Handbook and the Ver Halen Declaration. *See id.* at 60–63 (citing Ex. 1007, 3.1–3.4, 3.8–3.14, 3.26, 8.17; Ex. 1010 ¶¶ 203–213). Petitioner further contends that it would have been obvious to combine the references for the reasons addressed above with respect to the previous challenge, and that one of ordinary skill in the art would have further considered a plastics reference book such as the Modern Plastics Handbook for guidance on useful materials for the application in question. Pet. 63–65 (citing Ex. 1010 ¶¶ 214–216).

Patent Owner relies on the same arguments made above in the context of the previous challenges, and the dependency of claims 19 and 20 from independent claim 14. PO Resp. 52–53. Patent Owner does not raise any additional arguments specific to claims 19 and 20 or the use of the Modern Plastics Handbook. *Id.* We are persuaded by Petitioner’s arguments and evidence, and find that the combination of the Louisville Catalog, Plotner, the Werner Brochure, and the Modern Plastics Handbook disclose or render

¹² *Werner Climbing Products*, copyright 1996 (Ex. 1009) (“Werner Catalog”). Petitioner relies on the Werner Catalog as reaffirming its argument, rather than relying on the Werner Catalog as another reference in the proposed combination. *See* Pet. 60–61.

obvious all of the limitations of claims 19 and 20, and that one of ordinary skill in the art would have been motivated to combine the references in the manner proposed by Petitioner. *See* Pet. 55–65; Ex. 1007, 1.40, 1.60–1.63, 3.1–3.4, 3.8–3.14, 3.26, 8.13–8.17; Ex. 1010 ¶¶ 101, 191–216.

In summary, we find that (1) Patent Owner’s proposed level of ordinary skill in the art is consistent with the art of record; (2) the asserted references teach all the limitations of claims 19 and 20; (3) one of ordinary skill in the art would have had a reason to combine the identified components in the Louisville Catalog, Plotner, the Werner Brochure, and the Modern Plastics Handbook with a reasonable expectation of success; and (4) there is no persuasive objective evidence of nonobviousness in the record. Weighing these underlying factual determinations, a preponderance of the evidence persuades us that claims 19 and 20 are unpatentable as obvious over the Louisville Catalog, Plotner, the Werner Brochure, and the Modern Plastics Handbook.

CONCLUSION¹³

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
8–11	102(a)	Louisville Catalog		8–11
8–11	102(b)	Louisville Catalog		8–11
8–16	103(a)	Plotner, Louisville Catalog		8–16
8–16	103(a)	Plotner, Louisville Catalog, Werner Brochure	8–16	
19, 20	103(a)	Plotner, Louisville Catalog, Werner Brochure, Modern Plastics Handbook	19, 20	
Overall Outcome			8–16, 19, 20	

¹³ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 8–16, 19, and 20 of U.S. Patent No. 7,000,731 B2 have been shown, by a preponderance of the evidence, to be unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

PETITIONER:

Charles McMahon
Brian Jones
McDERMOTT WILL & EMERY
cmcMahon@mwe.com
bajones@mwe.com

PATENT OWNER:

Terry L. Wright
STITES & HARBISON, PLLC
twright@stites.com