

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARROWS UP, LLC,
Petitioner,

v.

OREN TECHNOLOGIES, LLC,
Patent Owner.

IPR2018-01232
Patent 9,682,815 B2

Before MITCHELL G. WEATHERLY, JAMES A. TARTAL, and
PAUL J. KORNICZKY, *Administrative Patent Judges*.

TARTAL, *Administrative Patent Judge*.

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

I. INTRODUCTION

Arrows Up, LLC (“Petitioner”)¹ filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of all claims (claims 1–19) of U.S. Patent No. 9,682,815 B2 (“the ’815 patent”). Pet. 1. We issued a decision to institute an *inter partes* review of these claims. Paper 7 (“Inst. Dec.”). After institution, Oren Technologies, LLC (“Patent Owner”)² filed a Patent Owner Response (Paper 16, “PO Resp.”), to which Petitioner filed a Reply (Paper 20, “Pet. Reply”). Patent Owner further filed a Sur-Reply. Paper 22 (“PO Sur-Reply”). Oral argument was held on October 25, 2019, and a transcript of the hearing appears in the record. Paper 28.

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 (2017). Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2012); 37 C.F.R. § 42.1(d) (2017). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–5 and 7–18 of the ’815 patent are unpatentable. Petitioner has not shown that claims 6 and 19 of the ’815 patent are unpatentable. *See* 35 U.S.C. § 316(e).

¹ Petitioner identifies itself, Broe Management Company LLC d/b/a The Broe Group, OmniTRAX, Inc., OmniTRAX Sand Holdings LLC, Omni AU, LLC, OES Holdings, LLC, and OmniTRAX Holdings Combined, Inc., as real parties in interest. Pet. 82–83.

² Patent Owner identifies itself, SandBox Logistics, LLC, and U.S. Silica Company as real parties in interest. Paper 3, 1.

II. BACKGROUND

A. *Related Proceedings*

Petitioner identifies as related proceedings the following *inter partes* review cases that involve patents that claim priority to the same applications as the '815 patent: *Proppant Express Investments, LLC v. Oren Technologies, LLC*, Case Nos. IPR2017-01917, IPR2017-01918, IPR2017-02103, and IPR2018-00914. Pet. 83. Petitioner has also challenged related patents in *inter partes* review proceedings in Case Nos. IPR2018-01230, IPR2018-01231, and IPR2018-01233.

Petitioner identifies as related proceedings the following district court cases: *SandBox Logistics LLC v. Grit Energy Solutions, LLC*, No. 3:16-cv-00012 (S.D. Tex.), and *SandBox Logistics LLC v. Proppant Express Investments, LLC*, No. 4:17-cv-00589 (S.D. Tex.). Pet. 83. The only related proceeding identified by Patent Owner is a district court case captioned: *Arrows Up, LLC v. US Silica Holdings, Inc., and Sandbox Logistics, LLC*, No. 4:17-cv-1945 (S.D. TX). Paper 3, 2.

B. *The '815 Patent*

The '815 patent, titled “Methods of Storing and Moving Proppant at Location Adjacent Rail Line,” issued June 20, 2017, from U.S. Application No. 15/251,020, filed August 30, 2016. Ex. 1001, codes (21), (22), (45), (54). The '815 patent generally relates to a method of delivering proppant to a well site following a series of steps. *Id.* at Abstract.

Hydraulic fracturing is the propagation of fractures in rock layers to release for extraction fossil fuels such as petroleum, natural gas, and coal seam gas. *Id.* at 2:11–16. Fracturing (also referred to as “fracking” or “fracing”) is done by injecting highly-pressurized fluid through a wellbore to

create new channels in the rock. *Id.* at 2:16–20. “The fracture width is typically maintained after the injection by introducing a proppant into the injected fluid.” *Id.* at 2:20–22. Fracking proppant is a material, “such as grains of sand, ceramic, or other particulates,” used in hydraulic fracturing. *Id.* at 2:22–24. The injection of proppant into the rock fractures prevents the fractures from closing when the injection is stopped. *Id.*

According to the ’815 patent, there is typically a need to ensure a large amount of high quality proppant is available during fracturing operations so that the fracturing operation does not stall and is not forced to use lower quality proppant. *Id.* at 3:6–17. Prior methods of transporting and storing proppant have involved dumping proppant on site and storing proppant in costly silos. *Id.* at 2:50–51, 2:64–66. The ’815 patent describes a system for the storage and transport of proppant that purports to enhance productivity, reduce liabilities, improve safety, and increase profits. *Id.* at 5:25–42. The ’815 patent includes only three figures to illustrate the claimed invention, each of which is reproduced below.

To illustrate an embodiment of the '815 patent, Figure 3 is reproduced below:

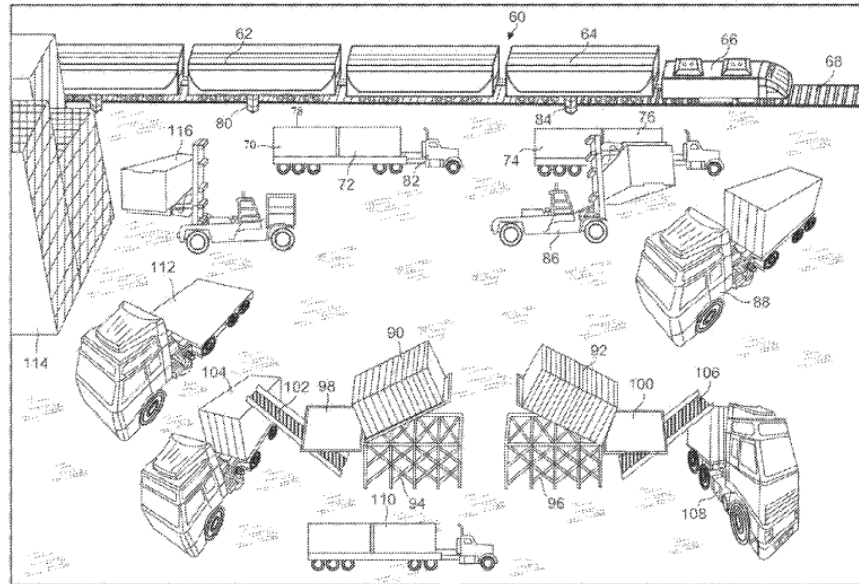
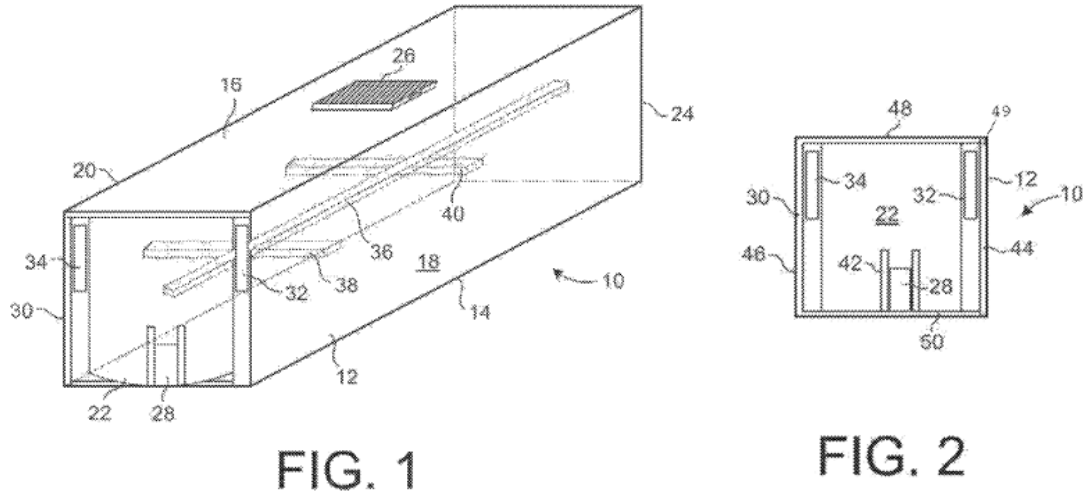


FIG. 3

Figure 3 is an illustration of system 60 of the claimed invention. Ex. 1001, 7:11–12, 8:48. Bulk material train 64 transports proppant to a desired location via vessel 62. *Id.* at 8:50–55. The proppant is then unloaded into containers 70, 72, 74, and 76 on trucks via conveyors 80 and 84. *Id.* at 8:59–9:12. Loader/unloader 86 moves containers 70, 72, 74, and 76 as needed and can remove containers from a truck and place them upon tilting mechanism 94 (or 96). *Id.* at 9:13–20. Tilting mechanism 94 includes a support panel pivotally connected to a frame, which allows the container to be tilted so that the end wall faces at an angle toward hopper 98 into which the proppant is discharged. *Id.* at 9:18–28. Conveyor 102 transports proppant from hopper 98 to pneumatic bulk trailer 104. *Id.* at 9:29–33. Figure 3 also shows empty containers 114 arranged in a stacked configuration and the '815 patent further explains that filled containers may also be stacked until such time as proppant is needed. *Id.* at 9:50–61.

To illustrate container 12 of the '815 patent, Figures 1 and 2 are reproduced below:



Figures 1 and 2 of the '815 patent are illustrations of proppant storage apparatus 10, including container 12. *Id.* at 7:7–10, 7:17–22, 8:25–26. As shown in the above Figures 1 and 2, container 12 has bottom wall 14, top wall 16, a pair of side walls 18 and 20, and a pair of end walls 22 and 24. *Id.* at 7:19–21. End surface 20 has structural uprights 44 and 46 thereon. *Id.* at 8:39–40. “Similarly, horizontal structural members 48 and 50 will extend between the structural uprights 44 and 46 at the top and bottom of the container 12.” *Id.* at 8:40–42.

According to the '815 patent, the “structural members enhance the integrity of the container so that a large amount of weight can be stacked upon the container 12.” *Id.* at 8:42–45. Proppant may be introduced into container 12 through hatch 26 and may be discharged from container 12 through flow gate 28. *Id.* at 7:29–34. To enhance its integrity, container 12 includes longitudinal member 36 extending from end wall 22 to end wall 24, and cross members 38 and 40 extending from side wall 18 to sidewall 20. *Id.* at 7:67–8:24.

C. Illustrative Claim

Claims 1 and 11 are independent. Claims 2–10 depend from claim 1 and claims 12–19 depend from claim 11. Claim 1 is illustrative of the subject matter and is reproduced below:

1. A method of storing and moving fracking proppant at a desired location in a plurality of separate containers constructed to store fracking proppant therein, the method comprising:
 - a) stacking a plurality of containers separate from a vehicle on top of one another so that a bottom of one of the plurality of containers overlies the top of another one of the plurality of containers to thereby define a stack, the stack positioned at a desired location, the structural integrity of the plurality of containers being enhanced by a plurality of structural uprights positioned to extend from the bottom to the top of each of the plurality of containers and thereby increase the weight carrying capacity of each of the plurality of containers when fracking proppant is positioned therein;
 - b) placing one or more of the plurality of containers from the stack onto one or more trailers of one or more vehicles by use of a container loader/unloader so that the one or more of the plurality of containers from the stack placed onto the one or more trailers defines a first one or more of the plurality of containers from the stack and so that remaining containers of the plurality of containers define a second one or more of the plurality of containers from the stack;
 - c) moving the first plurality of containers when positioned on the one or more trailers away from the stack of the second one or more of the plurality of containers; and
 - d) scaling the number of the plurality of containers according to the amount of proppant required at a particular location, each of the plurality of containers positioned to include an outlet adjacent the bottom for discharge of proppant therefrom, an opening adjacent the top thereof to load proppant therein, a pair of spaced-apart end walls connected to and extending between the bottom and the top, a pair of side walls connected to and extending between the pair of end walls and the top and the bottom, one or more structural support members

positioned to support each of the side walls of the pair of side walls and each of the end walls of the pair of end walls, and a flow gate positioned adjacent the outlet to control flow of proppant through the outlet each of the plurality of containers.

Ex. 1001, 11:58–12:33.

D. References and Expert Testimony

Reference/Expert Testimony	Date	Exhibit No.
US 8,915,691 B2 (“Mintz”)	Dec. 23, 2014	1002
US 2013/0206415 A1 (“Sheesley”)	Aug. 15, 2013	1003
ISO 1496-1: Series 1 Freight Containers—Specification and Testing—Part 1, General Cargo Containers for General Purposes (“ISO 1496-1”)	Aug. 1990	1010
ISO 6346: Freight Containers—Coding, Identification and Marking (“ISO 6346”)	Dec. 1995	1011
ISO/IEC 15416: Information Technology—Automatic Identification and Data Capture Techniques—Bar Code Print Quality Test Specification—Linear Symbols (“ISO 15416”)	Aug. 2000	1012
Robert Schaaf Declaration	May 31, 2018	1004
Fred P. Smith, P.E., C.S.P., Declaration	May 17, 2019	2007
Robert Schaaf Cross-Examination	Apr. 12, 2019	2008
Fred P. Smith Cross-Examination	July 30, 2019	1016

Patent Owner asserts that the testimony of Mr. Schaaf adds no probative weight and should be disregarded because it substantially duplicates statements in the Petition. *See, e.g.*, PO Resp. 17, 24. We are not persuaded that the similarity in content between the Petition and declaration warrants disregarding the declaration. We weigh Mr. Schaaf’s opinions on particular issues in accordance with the underlying support provided for those opinions. *See* 37 C.F.R. § 42.65(a) (2017) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

E. The Asserted Grounds of Unpatentability

In the Petition, Petitioner identified the grounds of unpatentability of claims 1–19 of the '815 patent using “ISO Standards” to collectively refer to ISO 1496-1, ISO 6346, and ISO 15416. Petitioner provided the following table of grounds in the Petition:

Reference(s)	35 U.S.C. §	Claims Challenged
Mintz in combination with ISO Standards	103	1, 3, 5–8, 10–12, 15–19
Sheesley in combination with ISO Standards	103	1–5, 7–18
Mintz	103	1, 3, 5–8, 10–12, 15–19
Sheesley	103	1–5, 7–18

Pet. 3.

As a preliminary matter, Patent Owner argues that the Petition improperly relies on “ISO Standards” as a single prior art reference when it is instead “three separate and distinct printed publications.” PO Resp. 13–14. Patent Owner further suggests that Petitioner was obligated to address every ISO Standard for every challenged claim merely because Petitioner used a short-hand description of the challenges as being based on “ISO Standards.” *Id.* at 52–53.

As we explained in our Institution Decision, we are not persuaded that the use of the term “ISO Standards” in the Petition was improper:

We agree with Patent Owner that Petitioner uses the term “ISO Standards” to refer to the collection of three distinct prior art references, filed as separate exhibits, each with a different publication: ISO 1496-1, ISO 6346, and ISO 15416. *See* Exs. 1010, 1011, 1012. Petitioner’s use of a potentially ambiguous shorthand for three distinct references was an ill-conceived choice that only introduces the potential for confusion, as Patent Owner argues. Nonetheless, we find Petitioner has

sufficiently shown precisely which ISO Standard it relies on in support of every challenge to a claim. For example, in regard to claim 1 Petitioner contends that the “[t]he ISO standard provides that ISO containers must be stackable,” and cites precisely Exhibit 1010 ¶ 6.2. Pet. 21; *see also id.* at 22 (stating that “ISO 1496-1 [Ex. 1010] . . . describes that ISO containers are stackable.”). Under such circumstances, there is no ambiguity as to what ISO Standard Petitioner is relying on and, thus, Patent Owner is not left trying to “figure out” which ISO Standard is applicable. We find Petitioner’s use of “ISO Standards” to refer collectively to three separate prior art references does not warrant denial of the Petition because the Petition sufficiently identifies precisely which ISO Standard is being asserted in regard to each ground and claim challenged.

Inst. Dec. 15–16. Petitioner further confirms that in the Petition it does not rely on ISO Standards as a single prior art reference. Pet. Reply 28–29.

Patent Owner has not shown that it was unable to determine from the Petition what teachings from the references were relied on in support of Petitioner’s contentions or that, subsequent to the Petition, Petitioner altered the references relied on to challenge any particular claim. We conclude Petitioner adequately explained for each claim challenged in the Petition how it relies on ISO 1496-1, ISO 6346, or ISO 15416 as individual publications with respect to each particular limitation.

Based on our review of the Petition, as explained in the Institution Decision, the grounds presented by Petitioner are summarized in the table below:

Reference(s)	35 U.S.C. §	Claims Challenged
Sheesley	103	1–5, 7–18
Sheesley, ISO 1496-1	103	10–18
Sheesley, ISO 6346, ISO 15416	103	5, 7
Sheesley, ISO 1496-1, ISO 6346, ISO 15416	103	16, 17
Mintz	103	1, 3, 5–8, 10–12, 15–19
Mintz, ISO 1496-1	103	1, 3, 5–8, 10–12, 15–19
Mintz, ISO 6346, ISO 15416	103	5, 7, 16, 17
Mintz, ISO 1496-1, ISO 6346, ISO 15416	103	5, 7, 16, 17

Pet. 3, 19–81; Pet. Reply 29; Inst. Dec. 8, 12–35.

III. ANALYSIS

In our analysis of Petitioner’s unpatentability contentions with respect to claims 1–19, we next address the applicable principles of law; the level of ordinary skill in the art; the proposed construction of claim terms; the scope and content of the asserted prior art; and then further analyze Petitioner’s contentions with respect to each alleged ground of unpatentability for purposes of determining whether Petitioner has shown by a preponderance of the evidence the unpatentability of the challenged claims.

A. Principles of Law

Petitioner contends the subject matter of the challenged claims would have been obvious over the asserted prior art. A patent claim is unpatentable as obvious if “the differences between” the claimed subject matter “and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the

art to which said subject matter pertains.” 35 U.S.C. § 103(a).³ An invention “composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). Rather, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *Id.*

An obviousness determination “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); see *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). 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 skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966). In this case, no objective evidence of nonobviousness was introduced by either party.

B. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, 35 U.S.C. § 103 requires us to resolve the level of

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103 effective March 16, 2013. Because the ’815 patent has an effective filing date before March 16, 2013, the pre-AIA version of § 103 applies.

ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. 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).

Petitioner proposes that a person having ordinary skill in the art would have had either (a) a bachelor's degree in an engineering or logistics discipline, plus one to two years of experience in hydraulic fracturing and logistical support of fracturing operations, or (b) four to five years of experience in hydraulic fracturing and logistical support for fracturing operations. Pet. 6–7 (citing Ex. 1004 ¶ 35). Patent Owner does not contest Petitioner's asserted level of ordinary skill in the art. *See generally* PO Resp. Based on the evidence provided, including the prior art of record, we agree with Petitioner's proposed level of ordinary skill and also find that the prior art of record further reflects the level of ordinary skill in the art. *See also Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (noting that the prior art of record may reflect the level of ordinary skill in the art).

C. Claim Construction

In an *inter partes* review, “[a] claim in an unexpired patent . . . shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b) (2017); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016) (upholding the use of the

broadest reasonable interpretation standard).⁴ “Under a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.” *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016).

Petitioner proposes constructions for the following claim terms: “desired location,” “adjacent,” and “a flow gate positioned adjacent the outlet to control flow of proppant through the outlet.” Pet. 7–8. Patent Owner argues that statements made by Petitioner about the construction of certain claim terms are incorrect, but further maintains that no claim term requires an express construction. PO Resp. 15–16. We agree with Patent Owner that no claim term requires express construction for purposes of this Decision. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“claim terms need only be construed ‘to the extent necessary to resolve the controversy’” (internal citation omitted)).

D. Scope and Content of the Prior Art

To demonstrate the unpatentability of the challenged claims of the ’815 patent, Petitioner relies on Sheesley, ISO Standards (separately, ISO 1496-1, ISO 6346, and ISO 15416), and Mintz, each of which is briefly summarized below.

⁴ Although the claim construction standard applied in *inter partes* review was changed to the federal court claim construction standard used in a civil action under 35 U.S.C. § 282(b), that change does not apply to this proceeding because the Petition was filed before November 13, 2018, the effective date of the change. *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, 51,344 (Oct. 11, 2018) (now codified at 37 C.F.R. pt. 42 (2019)).

1. Summary of Sheesley

Sheesley, titled “Method and Apparatus for Modifying a Cargo Container to Deliver Sand to a Frac Site,” describes cargo containers for carrying “proppant such as sand from a quarry or source to the frac site.” Ex. 1003, codes (54), (57). In particular, Sheesley discloses a method whereby “cargo containers may be taken directly to the quarry and loaded with sand . . . [and that the] containers can then move through all of the normal modes of transportation including ship, barge, rail or by truck, all the way to the frac site.” *Id.* ¶ 17.

To illustrate an embodiment of the method, Figure 2 of Sheesley is reproduced below:

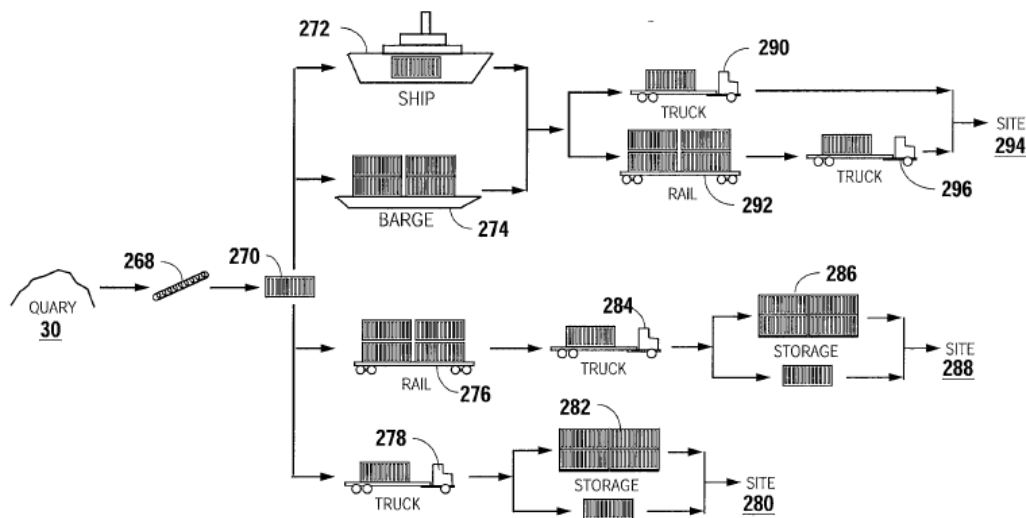


Fig. 2

According to Sheesley, the above Figure 2 depicts the delivery of “sand from the quarry or source to the frac site.” *Id.* ¶ 20. Sand from quarry 30 or source may be loaded by conveyor 268 and into cargo container 270. *Id.* ¶ 78. Containers 270 may be loaded on ship 272, barge 274, rail 276, or

flatbed truck trailer 278. *Id.* If container 270 is loaded on trailer 278, container 270 may be taken directly to fracing site 280 or placed in storage 282 at fracing site 280. *Id.* ¶ 79. Sheesley further discloses that the containers can be stacked and that a container handler can be used to pick up full or empty containers. *Id.* ¶ 83 (referencing Figs. 3, 4).

2. Summary of ISO Standards

According to Petitioner, the “International Organization for Standardization (‘ISO’) is a global federation of standards-setting bodies that promulgates international technical, industrial, and commercial standards,” including uniform standards for shipping containers. Pet. 17 (citing Ex. 1013, 9–10).

ISO 1496-1, titled “Series 1 freight containers – Specification and testing – Part 1: General cargo containers for general purposes,” provides “basic specifications and testing requirements for ISO series 1 freight containers of the totally enclosed general purpose types and certain specific purpose types (closed, vented, ventilated or open top) which are suitable for international exchange and for conveyance by road, rail and sea, including interchange between these forms of transport.” Ex. 1010 ¶ 1.1. Pertinent to Petitioner’s contentions, ISO 1496-1: (1) provides testing specifications “to prove the ability of a fully loaded container to support a superimposed mass of containers;” and (2) states that fork-lift pockets used for handling loaded or unloaded containers may be provided as optional features. *Id.* ¶¶ 5.8.1.1, 6.2.1, Annex C; *see also* Pet. 17–18.

ISO 6346, titled “Freight containers – Coding, identification and marking,” provides “a system for the identification and presentation of information about freight containers” for use “in documentation, control and

communications (including automatic data processing systems), as well as for display on the containers themselves.” Ex. 1011 ¶ 1.1. Pertinent to Petitioner’s contentions, ISO 6346 specifies an identification system including a three letter owner code and a six numeral serial number. *Id.* ¶ 3.1; *see also* Pet. 18.

ISO 15416, titled “Information technology – Automatic identification and data capture techniques – Bar code print quality test specification – Linear symbols,” sets forth a methodology which “provides a basis for grading the quality of bar code symbols in relation to their expected performance when read.” Ex. 1012, Introduction. Pertinent to Petitioner’s contentions, ISO 15416 “specifies the methodology for the measurement of specific attributes of bar code symbols” and “defines a method for evaluating these measurements and deriving an overall assessment of symbol quality.” Ex. 1012 ¶ 1; *see also* Pet. 18.

3. *Summary of Mintz*

Mintz, titled “Apparatus for Transporting Frac Sand in Intermodal Container,” is directed to an internal structure adapted to support and strengthen a container manufactured to International Organization for Standardization (ISO) specifications and a valve apparatus to transfer sand and proppant material from the container to fracking operations. Ex. 1002, code (54), 1:63–2:13. In particular, Mintz discloses, “[h]orizontal and angular peripheral bracing framework to strengthen the side walls of such standard ISO intermodal shipping container.” *Id.* at 2:55–57.

1. Independent Claim 1

Petitioner contends each of the limitations of claim 1 is taught by Sheesley. Pet. 49–61, 81; Pet. Reply 2–8. Patent Owner argues that Sheesley fails to teach “structural uprights,” as discussed below. PO Resp. 38–41; PO Sur-Reply 16–22. For the reasons provided below, we find Petitioner has shown by a preponderance of the evidence that Sheesley teaches every limitation of claim 1.

- a. A method of storing and moving fracking proppant at a desired location in a plurality of separate containers constructed to store fracking proppant therein, the method comprising*

To the extent that the preamble is limiting, Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches a corresponding method of using “modified cargo containers” to transfer sand to frac sites. Pet. 49–50 (citing Ex. 1003, Abstract, ¶¶ 2, 78).

- b. stacking a plurality of containers separate from a vehicle on top of one another so that a bottom of one of the plurality of containers overlies the top of another one of the plurality of containers to thereby define a stack, the stack positioned at a desired location*

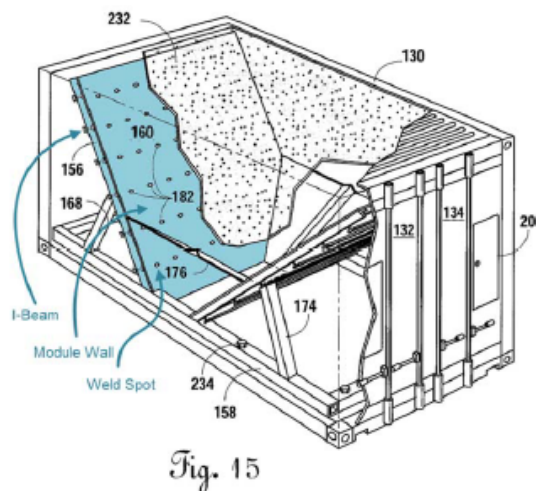
Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches that modified containers filled with proppant may be stacked in a storage location, corresponding to the stacking requirement. *Id.* at 50 (citing Ex. 1003 ¶¶ 18, 21, 23, 84, Figs. 1–3, 5, 7, 8). Indeed, Sheesley expressly states that the “modified frac containers may be stacked in any conventional means” and illustrates containers stacked on top of one another separate from a vehicle. Ex. 1003 ¶ 18, Figs. 2, 3.

- c. the structural integrity of the plurality of containers being enhanced by a plurality of structural uprights positioned to extend from the bottom to the top of each of the plurality of containers and thereby increase the weight carrying capacity of each of the plurality of containers when fracking proppant is positioned therein*

In the Petition, as we discussed in our Institution Decision, Petitioner identifies two alternative arguments corresponding to how Sheesley teaches the “plurality of structural uprights” recited in claim 1. See Inst. Dec. 19–22. First, Petitioner argues that front module wall 160 and rear module wall 162 of Sheesley correspond to the “plurality of structural uprights.” Pet. 51–52 (citing Ex. 1003 ¶¶ 52, 53, 55). Second, Petitioner argues that the corner castings and corner posts shown in the standard cargo container illustrated in Petitioner’s annotated Figure 9 of Sheesley are sufficient to meet the requirements of “structural uprights” recited in claim 1. Pet. 52. We are persuaded by the second argument, not the first, and address each below.

i. front module wall 160 and rear module wall 162

Petitioner provides an annotated version of Figure 15 of Sheesley, reproduced below.



Annotated Figure 15 of Sheesley shows a partial exploded view of cargo container 130 having hopper module 156 inside, including front module wall 160 (in blue) supported by front braces 168. Pet. 52; Ex. 1003 ¶¶ 52, 62. Petitioner asserts that front module wall 160 and rear module wall 162 (shown, but not labeled in Figure 15) “each extend from the bottom to the top of the container.” Pet. 51.

In our Institution Decision, we raised several potential issues with Petitioner’s argument. Specifically, we provided the following discussion to the parties:

Front module wall 160 does not appear to reach the top of the container in Figure 15. Petitioner does explain how a person of ordinary skill would understand from Figure 15 that front module wall 160 is “positioned to extend from the bottom to the top” of the container, as recited by claim 1. *See also* Ex. 1004 ¶ 142 (providing no additional explanation beyond citing Figure 15 to show that the front module wall 160 and rear module wall 162 extend from the bottom to the top of the container). Additionally, we note that Figure 10 of Sheesley illustrates hopper module 156 being inserted into container 130 through door 132 (not shown) and door 134. Ex. 1003 ¶ 51. Petitioner does not address how front module wall 160 and rear module wall 162 are “positioned to extend from the bottom to the top” of the container, yet may be inserted into the container through an opening that does not extend to the top of the container. Further, although Sheesley states that “[a]lternatively, the hopper module 156 may be constructed inside of the cargo container 130,” Petitioner does not rely on this disclosure or otherwise argue in the Petition that it would have been obvious to modify the front module wall 160 and rear module wall 162 to correspond to the claimed “structural uprights” that extend “from the bottom to the top,” as required by claim 1.

Inst. Dec. 21–22.

Notwithstanding the fact that we raised the issue in the Institution Decision, Patent Owner elected not to dispute Petitioner's contention that front module wall 160 and rear module wall 162 "each extend from the bottom to the top of the container." See PO Resp.⁵ As a result, Petitioner argues in reply that Patent Owner waived the argument. Pet. Reply 6. We need not reach the issue of waiver in this case because the burden remains on Petitioner to show that Sheesley teaches the claim limitation, even in the absence of any argument by Patent Owner.

Petitioner makes two arguments in support of its contention, neither of which are supported by evidence identified by Petitioner. First, Petitioner argues that "positioned to extend from the bottom to the top" means nothing more than to "extend vertically," and does not require "physical contact." *Id.* at 6. Thus, Petitioner reads out of the claims any requirement of proximity to the bottom or the top, and instead reads the limitation as only an indication of direction (i.e., any "structural upright" in the vertical plane).

⁵ Patent Owner, instead, argues in response that the front and rear hopper module walls of Sheesley decrease the *volume* available in the modified container such that the *weight* carrying capacity of each container would be smaller than an unmodified container. PO Resp. 39–40. Indeed, claim 1 requires "structural uprights" that "increase the weight carrying capacity of each of the plurality of containers when fracking proppant is positioned therein." However, Patent Owner's argument appears to conflate the volume capacity of the modified container with the weight carrying capacity, which are not the same. Moreover, the claim is not limited to fracking proppant with any particular density, or even only fracking proppant with regard to the weight being carried. Thus, Patent Owner's argument that a reduced volume capacity necessarily reduces the weight carrying capacity of the container is unpersuasive and dependent on assumptions outside the scope of the claims.

Petitioner did not propose such an express definition in the Petition and identifies no persuasive evidence to support that such a broad construction would have been reasonable. Nor has Petitioner directed us to any disclosure in the '815 patent to suggest that an element that does not reach the top of the container nevertheless is “positioned to extend from the bottom to the top,” as required. Second, Petitioner argues that the hopper module 156 may be constructed inside of the cargo container 130. *Id.* We noted as much in the Institution Decision, further pointing out that Petitioner did not rely on this disclosure in the Petition and did not offer any explanation for how such a disclosure would have rendered the claimed limitation obvious. *See* Inst. Dec. 21–22.

In sum, the Petition left Patent Owner and the Board to guess at what Petitioner’s contentions were in regard to how front module wall 160 and rear module wall 162 of Sheesley “each extend from the bottom to the top of the container” when it is clear from the figure relied upon by Petitioner that the module walls do not extend “to the top of the container.” Like the Petition, the declaration of Mr. Schaaf identifies only Figure 15 of Sheesley as showing how front module wall 160 and rear module wall 162 of Sheesley “each extend from the bottom to the top of the container.” Ex. 1004 ¶ 142. Petitioner never argues that it would have been obvious to modify Sheesley to meet the claimed limitation. Thus, based on the arguments presented by Petitioner, we are not persuaded that Figure 15 of Sheesley teaches “a plurality of structural uprights positioned to extend from the bottom to the top of each of the plurality of containers,” as required by the challenged claims of the '815 patent.

ii. corner posts

Petitioner has shown that Sheesley teaches corner posts corresponding to the claimed “plurality of structural uprights positioned to extend from the bottom to the top of each of the plurality of containers.” Pet. 52. In support, Petitioner provides an annotated version of Figure 9 of Sheesley, reproduced below.

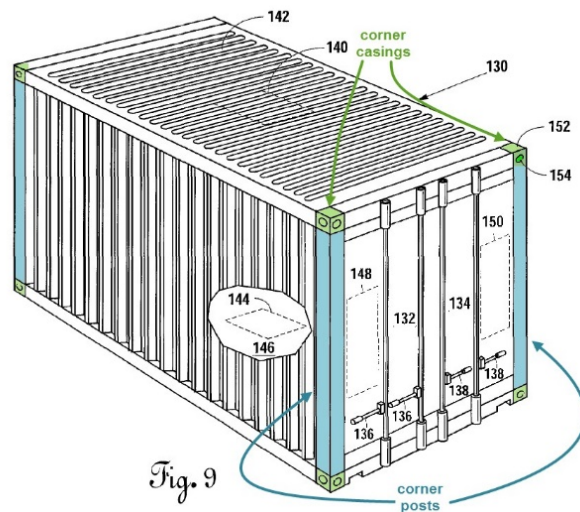


Figure 9 shows “a standard 8 ft.x8-1/2 ft.x20 ft. cargo container 130,” including “eight corner castings 152 [in green] with openings 154 for twist-lock fasteners (not shown).” Ex. 1003 ¶ 50; *see also id.* ¶ 27 (stating that Figure 9 “is a pictorial view of a cargo container illustrating where openings should be cut.”). Thus, Petitioner’s contention is that the corner posts (in blue) shown in the standard cargo container illustrated in Petitioner’s annotated Figure 9 are sufficient to meet the requirements of “structural uprights” recited in claim 1. Petitioner’s contentions are supported without further explanation by Mr. Schaaf. Ex. 1004 ¶ 142.

Patent Owner argues that Petitioner may not rely on corner posts as the recited “structural uprights,” because Petitioner allegedly uses the same elements of Sheesley with respect to the “structural support members”

recited later in claim 1. PO Resp. 40. We find this argument unpersuasive for the reasons provided in our discussion below of the “structural support members” limitation, which explains that the Petition makes sufficiently clear that Sheesley teaches “structural support members” that are distinct from the corner posts Petitioner relies on as corresponding to the claimed “structural uprights.” For substantially the same reasons, we also reject Patent Owner’s argument that Petitioner failed to identify the corner posts of Sheesley as “structural uprights.” See PO Sur-Reply 19–22. Patent Owner offers no other evidence to refute that the corner posts taught by Sheesley are sufficient to correspond to the recited “plurality of structural uprights positioned to extend from the bottom to the top of each of the plurality of containers and thereby increase the weight carrying capacity of each of the plurality of containers when fracking proppant is positioned therein.” In fact, the structural uprights 44 and 46 shown in Figure 2 of the ’815 patent (reproduced above) appear indistinguishable from the corner posts shown in Sheesley Figure 9.

- d. placing one or more of the plurality of containers from the stack onto one or more trailers of one or more vehicles by use of a container loader/unloader so that the one or more of the plurality of containers from the stack placed onto the one or more trailers defines a first one or more of the plurality of containers from the stack and so that remaining containers of the plurality of containers define a second one or more of the plurality of containers from the stack*

Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches the “placing” limitation, including stacking containers of proppant in storage locations (Ex. 1003 ¶ 18, Fig. 2), using trailers to transport cargo containers to storage or fracking sites (*id.* ¶¶ 80, 87), and

using a “Rough Terrain Cargo Handler,” corresponding to a “loader/unloader,” to move filled containers (*id.* ¶ 83). Pet. 53. Petitioner reasons that a person of ordinary skill would have understood from Sheesley that containers could be transported on trailers from the storage site to the fracking site. *Id.* Mr. Schaaf also explains the “placing” limitation is taught by Sheesley for the following reason:

in the process of loading a container from a stack onto the trailer, the container being loaded is necessarily removed from the stack and placed on the trailer, resulting in at least that container being on the trailer, with the remaining containers remaining in the stack.

Ex. 1004 ¶ 146.

- e. moving the first plurality of containers when positioned on the one or more trailers away from the stack of the second one or more of the plurality of containers*

Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches the “moving” limitation, including stacking and transporting containers, and that “transporting containers towards a well site necessarily requires that the containers are moved away from where the containers were located.” Pet. 54–55 (citing Ex. 1003 ¶¶ 2, 25, 78, 80, 86, 88, Figs. 2, 7). Petitioner has further shown that a person of ordinary skill would have understood from Sheesley that the containers may be moved away from one another in stages, rather than all at once. *Id.* at 55 (citing Ex. 1004 ¶ 149).

- f. scaling the number of the plurality of containers according to the amount of proppant required at a particular location*

Petitioner has shown (and Patent Owner does not dispute) that a person of ordinary skill would have understood from Sheesley the importance of having the required amount of proppant at the well site for

fracking to keep the fractures created through fracking open and the oil and gas flowing. Pet. 55–56 (citing Ex. 1003 ¶¶ 8, 9). Sheesley also explains the increased costs associated with the failure to unload trucks carrying proppant when they arrive. *Id.* at 56 (citing Ex. 1003 ¶ 11). Petitioner reasons that a person of ordinary skill would have understood the need to have the correct amount of proppant at a particular location, corresponding to the requirement of claim 1. *Id.* Accordingly, Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches the “scaling” limitation.

g. each of the plurality of containers positioned to include an outlet adjacent the bottom for discharge of proppant therefrom, an opening adjacent the top thereof to load proppant therein

Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches that a lower hatch is placed in bottom hole 144 cut into bottom 146 of cargo container 130 which “may be opened to remove the sand therefrom,” corresponding to the recited “outlet,” and an upper hatch placed in top hole 140 cut into top 142 of cargo container 130, which may be “used to load sand in the cargo container,” corresponding to the recited “opening adjacent to the top.” Pet. 56–58 (citing Ex. 1003 ¶¶ 14, 16, 21, 50, 57, 66, Figs. 10, 15).

h. a pair of spaced-apart end walls connected to and extending between the bottom and the top, a pair of side walls connected to and extending between the pair of end walls and the top and the bottom

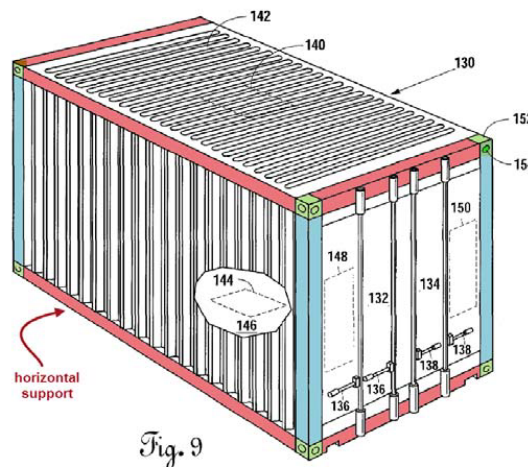
Petitioner has shown (and Patent Owner does not dispute) that Figure 9 of Sheesley teaches a container with a pair of end walls and a pair of sidewalls, as recited by claim 1. Pet. 59 (citing Ex. 1003 ¶ 50).

- i. *one or more structural support members positioned to support each of the side walls of the pair of side walls and each of the end walls of the pair of end walls*

Petitioner has shown that “Sheesley discloses that the modified container contains one or more structural support members at the *corners* and *edges* positioned to support each of the side walls of the pair of side walls and each of the end walls of the pair of end walls.” Pet. 59 (emphasis added) (citing Ex. 1003, Figs. 9, 10). Additionally, Petitioner has shown that Sheesley teaches modifying a standard ISO container and that all ISO containers “must meet certain strength requirements” pursuant to ISO 1496-1. *Id.* at 60 (citing Ex. 1010 ¶¶ 5.1, 5.2, 5.3.1, 6.3, 6.4).

Petitioner also shows how Sheesley teaches “structural support members” *in the Petition* as recited by claim 1 in discussing claim 9, which depends from claim 1 and further recites “wherein the one or more structural support members of each of the plurality of containers further includes a plurality of horizontal structural members extending between the plurality of structural uprights.” Ex. 1001, 13:1–7.

Petitioner provides an annotated and colored version of Figure 9 of Sheesley, reproduced below.



Pet. 79. As noted above, Figure 9 illustrates standard cargo container 130, and was annotated by Petitioner to show horizontal supports (red) extending between the corner structural supports (green). *Id.*; *see also* Ex. 1004 ¶ 214. Thus, contrary to Patent Owner’s argument addressed above, the Petition makes clear that Sheesley teaches both the claimed “structural uprights” (shown in blue) and “structural support members” (shown in red). *See also* Pet. 64 (explaining in regard to challenged claim 11 that Figure 9 of Sheesley teaches horizontal supports extending between the end and side walls corresponding to the recited “structural support members”). Patent Owner offers no other evidence to refute that the horizontal supports taught by Sheesley are sufficient to correspond to the recited “one or more structural support members positioned to support each of the side walls of the pair of side walls and each of the end walls of the pair of end walls.” In fact, the “horizontal structural members 48 and 50” shown in Figure 2 of the ’815 patent (reproduced above) appear indistinguishable from the horizontal supports shown in Sheesley Figure 9.

j. a flow gate positioned adjacent the outlet to control flow of proppant through the outlet each of the plurality of containers

Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches bottom hole 144 “with lower hatch 214 having a wedge-shaped slot 216 therein in which the lower sliding door 218 opens and closes the lower opening 220,” corresponding to the recited flow gate. Pet. 60–61 (quoting Ex. 1003 ¶ 57).

k. Summary

Petitioner has shown that Sheesley teaches every limitation of claim 1 and, for the reasons provided above, we conclude that Petitioner has shown

by a preponderance of the evidence that independent claim 1 is unpatentable as obvious over Sheesley.

2. Independent Claim 11

Petitioner contends each of the limitations of claim 11 is taught by Sheesley, alone, or in combination with ISO 1496-1. Pet. 61–68; Pet. Reply 8–17. Patent Owner argues that Sheesley fails to teach limitations regarding “positioning prongs of a forklift” and “structural uprights,” as discussed below. PO Resp. 41–49; PO Sur-Reply 16–22. For the reasons provided below, we find Petitioner has shown by a preponderance of the evidence that Sheesley teaches every limitation of claim 11.

- a. A method of storing and moving fracking proppant at a desired location in a plurality of separate containers constructed to store fracking proppant therein, the method comprising*

To the extent that the preamble is limiting, Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches a corresponding method of using “modified cargo containers” to transfer sand to frac sites. Pet. 61 (citing Ex. 1004 ¶ 167); *see also id.* at 49–50 (citing Ex. 1003, Abstract, ¶¶ 2, 78).

- b. removing fracking proppant from a railcar*

Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches a delivery scenario involving hauling proppant in containers by railcar and transferring the containers to truck trailers, corresponding to the recited “removing fracking proppant from a railcar.” Pet. 61–62 (citing Ex. 1003 ¶¶ 17, 19, 42, 49, 77, 78, 80, 81, claim 15, claim 21, Fig. 1).

- c. *storing the proppant in a plurality of containers separate from the railcar, each container of the plurality of containers comprising:
an opening adjacent the top thereof to receive proppant into the container, a pair of spaced-apart end walls connected to and extending between the bottom and the top, and a pair of sidewalls connected to and extending between the pair of end walls and the top and the bottom, and one or more structural support members extending between the pair of end walls and one or more structural support members extending between the side walls,
an outlet positioned in a substantially central portion of the container to discharge proppant therefrom, and
a flow gate positioned adjacent the outlet to control flow of proppant through the outlet;
transporting one or more of the plurality of containers with one or more vehicle trailers;
removing the one or more of the plurality of containers from the one or more vehicle trailers*

Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches the “storing,” “transporting,” and “removing” limitations. Pet. 62–66 (citing Ex. 1004 ¶¶ 172–183); *see also id.* at 50 (describing “storing proppant”) (citing Ex. 1003 ¶¶ 18, 21, 23, 84, Figs. 1–3, 5, 7, 8), 58 (describing “an opening adjacent the top” of the container (citing Ex. 1003, Abstract, ¶¶ 14, 16, 50, Fig. 10), 59 (describing “end walls” and “sidewalls”) (citing Ex. 1003 ¶ 50, Fig. 9), 64 (describing horizontal supports corresponding to “structural support members”) (citing Ex. 1003, Fig. 9), 56–57 (describing an “outlet”) (citing Ex. 1003, Abstract, ¶¶ 16, 21, 50, 57, 66, Fig. 15), 60–61 (describing a “flowgate”) (citing Ex. 1003 ¶¶ 16, 57, 66), 54–55 (describing “transporting” containers) (citing Ex. 1003 ¶¶ 2, 25, 78, 80, 86, 88, Fig. 7), 53–54 (describing “removing” containers) (citing Ex. 1003 ¶¶ 25, 78, 80, 83, 87, 88, Fig. 7).

- d. positioning prongs of a forklift in one or more slots positioned adjacent the bottom of each of the plurality of containers in a defined region to thereby enhance lifting and positioning of the containers for stacking and moving the plurality of containers; and*

Claim 11 requires “positioning prongs of a forklift.” The ’815 patent does not address a forklift outside of the claims and the container illustrated in the ’815 patent appears to lack forklift pockets. There is no dispute that Sheesley also does not expressly describe container slots into which prongs of a forklift may be inserted to lift or position the container. Accordingly, we are not persuaded that Sheesley, alone, teaches “positioning prongs of a forklift.”

Petitioner also contends that Sheesley modifies a standard cargo container and that ISO 1496-1 teaches “forklift pockets” as optional features for containers. Pet. 66 (citing Ex. 1010 ¶ 5.8.1, Annex C). Petitioner reasons that a person of ordinary skill in the art “would have been motivated to combine the teachings of the specific container disclosed in ISO 1496-1 to the general ISO container teachings disclosed in Sheesley in order to facilitate transferring the container, because ISO 1496-1 teaches an optimal and widely adopted method of effectuating the container movement described in Sheesley.” *Id.* at 67–68. We agree.

Patent Owner argues that Sheesley describes the use of a Rough Terrain Container Handler (“RTCH”) to pick up and stack containers, not a forklift, and that the use of the RTCH “is preferable to the use of a forklift” because well sites tend to be rough. PO Resp. 41–46. Patent Owner further argues that, because Sheesley uses trailers to transport containers, “[i]t would be much more difficult, if not impossible, to place Sheesley’s

containers on its trailers using a forklift.” *Id.* at 45. Patent Owner further argues that Petitioner fails to show obviousness because “whether a [person of ordinary skill in the art] *could* have modified Sheesley’s container to add forklift pockets and use a forklift for discrete tasks does not mean that one *would* have done so.” PO Sur-Reply 22–24.

We find Patent Owner’s arguments not persuasive. Petitioner explains that claim 11 is directed to moving containers at any “desired location” at any point in the supply chain, not exclusively at rough well sites. We agree with Petitioner that a person of ordinary skill in the art would have understood the benefit of having “multiple methods of effectuating the container movement described in Sheesley.” Pet. Reply 14–15. We credit the testimony of Mr. Schaaf, who explains as follows:

Indeed, as Sheesley discloses, the entire purpose of a modular container is to able to move the container “through all of the normal modes of transportation including ship, barge, rail or by truck, all the way to the frac site.” Ex. 1003 (Sheesley) ¶[0017]. Thus, it is my opinion that a [person of ordinary skill in the art] would have been motivated to combine the teachings of the specific container disclosed in ISO 1496-1 Standard to the general ISO container teachings disclosed in Sheesley in order to facilitate transferring the container, because ISO 1496-1 Standard teaches an optimal and widely-adopted method of effectuating the container movement described in Sheesley.

Ex. 1004 ¶ 186. We have considered Mr. Smith’s contrary testimony and find it unpersuasive because it is inconsistent with ISO 1496-1, which makes clear that the use of forklifts to move containers with slots was routine, and because the alleged preference for an RTCH at rough well sites is beyond the scope of claim 11, which recites such use “at a desired location” not limited to any particular site conditions. *See* Ex. 2007 ¶¶ 62–68.

- e. scaling the number of containers at the desired location according to the amount of proppant required at a particular location,*

Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches the “scaling the number of containers” limitation. Pet. 68 (citing Ex. 1004 ¶ 189); *see also id.* at 55–56 (citing Ex. 1003 ¶¶ 8, 9, 11, 79–81, Fig. 2; Ex. 1004 ¶¶ 152, 153).

- f. each of the plurality of containers has a plurality of structural uprights positioned to extend from the bottom to the top of each of the plurality of containers at intervals between the side walls and the end walls to thereby increase the weight carrying capacity of each of the plurality of containers.*

Petitioner contends the “structural uprights” recited in claim 11 are indistinguishable from the “structural uprights” of claim 1 and are obvious over Sheesley for the same reasons as provided in the Petition for claim 1. Pet. 68. For the reasons explained above with regard to claim 1, Petitioner has shown by a preponderance of the evidence that the corner posts of Sheesley correspond to “structural uprights positioned to extend from the bottom to the top of each of the plurality of containers,” but Petitioner has not shown that front module wall 160 and rear module wall 162 correspond to this limitation.

For purposes of claim 11, the issue that remains is whether the corner posts of Sheesley are “at intervals between the side walls and the end walls,” which is not a limitation present in claim 1. The term “intervals” does not appear in the Specification of the ’815 patent outside of claim 11 and neither party expressly proposed a construction for this claim language. Petitioner, by arguing in the Petition that claim 11 would have been obvious for the

same reasons as claim 1 on this point, has taken the position that the corner posts of Sheesley are “at intervals between the side walls and the end walls.” Neither the Petition nor Mr. Schaaf’s declaration, however, provides any additional explanation. See Ex. 1004 ¶ 190.⁶

Patent Owner argues that “corner posts are located at the corners of the container, which in no way puts them at intervals between either the side walls or the end walls.” PO Resp. 49–50. Claim 11, however, does not recite “intervals between *either* the side walls *or* the end walls,” as Patent Owner suggests, but instead requires “intervals between the side walls *and* the end walls.” Mr. Smith was asked during his deposition whether the structural uprights 44 and 46 of the ’815 patent are at intervals between the sidewalls and the end walls, and he indicated that he had not “really looked at it” and had no opinion on that. Ex. 1016, 123:20–124:11. Upon further questioning, Mr. Smith indicated that structural uprights 44 and 46 were probably not at intervals “because at intervals means you are going to have it divided up into pieces so to speak,” but he could not identify anything in Figures 1 or 2 of the ’815 patent that met such a definition. *Id.* at 126:4–128:20. Counsel for Patent Owner was also asked during the hearing what “intervals” means, repeatedly, but proposed no construction, suggested applying the “plain meaning,” and noted that “for many

⁶ During the oral argument, when counsel for Petitioner was asked whether the expert on behalf of Petitioner “provided anything in regards to what the ‘interval’ refers to or means” he responded affirmatively and indicated that he would provide a citation later in the hearing. Paper 28, 24:1–8. Counsel failed to provide any citation later in the hearing and our review of the record fails to disclose any place where Mr. Schaaf provided any opinion on what “interval” refers to or means.

straightforward terms, it's so simple it's hard to describe.” Paper 28, 45:13–48:2.

Petitioner argues in reply that a structural upright at the corners (i.e., a “corner post”) is positioned between a side wall and an end wall, as required by claim 11. Pet. Reply 8–10. As support, Petitioner explains that the '815 patent must disclose “a plurality of structural uprights . . . at intervals between the side walls and the end walls,” as claimed, that the only “structural uprights” disclosed by the '815 patent are corner posts identified in Figure 2 as “structural uprights 44 and 46,” and, therefore, corner posts are necessarily “at intervals between the side walls and the end walls,” as used in the '815 patent. We agree. Under the broadest reasonable interpretation, Petitioner, who bears the burden, has sufficiently shown that a corner post is “between a side wall and an endwall,” as that is the only structure disclosed by the '815 patent that corresponds to the claim language. Moreover, Patent Owner has provided no persuasive evidence or explanation to rebut this conclusion.

g. Summary

Petitioner has shown both that Sheesley in combination with ISO 1496-1 teaches every limitation of claim 11 and a sufficient rationale for combining the two references. For the reasons provided above, we conclude that Petitioner has shown by a preponderance of the evidence that independent claim 11 is unpatentable as obvious over Sheesley and ISO 1496-1. Petitioner has not shown that claim 11 would have been obvious over Sheesley, alone, because Petitioner did not establish that Sheesley teaches or otherwise renders every limitation of claim 11 obvious.

3. Dependent Claims 2 and 14

Claims 2 and 14 recite transporting proppant by railcar to a desired location in certain quantities, which Petitioner has shown (and Patent Owner does not dispute) is taught by Sheesley. Pet. 69–70 (citing Ex. 1003 ¶¶ 2–4, 16, 17, 19, 42, 49, 50, 77, 78). We conclude that Petitioner has shown by a preponderance of the evidence that claim 2, which depends from claim 1, is unpatentable as obvious over Sheesley. We also conclude that Petitioner has shown by a preponderance of the evidence that claim 14, which depends from claim 11, is unpatentable as obvious over Sheesley and ISO 1496-1.

4. Dependent Claims 3 and 15

Claims 3 and 15 recite positioning containers of proppant “adjacent a fracturing operation of a production field.” Corresponding to this limitation, Petitioner has shown (and Patent Owner does not dispute) that “Sheesley explains that modified containers can be ‘loaded on flatbed truck trailer’ and ‘taken directly to the fracing site 280 or placed in storage 282 at the fracing site 280.’” *Id.* at 71 (quoting Ex. 1003 ¶ 79). We conclude that Petitioner has shown by a preponderance of the evidence that claim 3, which depends from claim 1, is unpatentable as obvious over Sheesley. We also conclude that Petitioner has shown by a preponderance of the evidence that claim 15, which depends from claim 11, is unpatentable as obvious over Sheesley and ISO 1496-1.

5. Dependent Claim 12

Claim 12 recites stacking containers on top of one another “to thereby define a stack to reduce the footprint of the stored containers.” Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches that “modified frac containers may be stacked in any conventional means,” and

that Sheesley illustrates stacked containers “so that a bottom of one of the plurality of containers overlies the top of another one of the plurality of containers,” as required by claim 12. *Id.* at 50, 80; Ex. 1003 ¶¶ 18, 23, 84, Figs. 1, 3, 5, 7, 8. We conclude that Petitioner has shown by a preponderance of the evidence that claim 12, which depends from claim 11, is unpatentable as obvious over Sheesley and ISO 1496-1.

6. Dependent Claims 4 and 13

Claims 4 and 13 further require that a certain number of containers are positioned in two adjacent stacks. Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches that “modified frac containers may be stacked in any conventional means,” and that containers “can be stacked up to seven containers high.” Pet. 72–73 (quoting Ex. 1003 ¶¶ 6, 18). Claim 4 further recites “wherein the one or more structural support members include a plurality of support bars.” Petitioner has shown that Sheesley teaches “that the modified container contains one or more structural support members at the corners and edges positioned to support each of the side walls of the pair of side walls and each of the end walls of the pair of end walls.” *Id.* at 59 (citing Ex. 1003, Figs. 9, 10); *see also id.* at 59–60, 74. The arguments presented by Patent Owner regarding structural support members are addressed above with regard to claim 1. Patent Owner does not raise any additional arguments with respect to the “support bars” recited in claim 4.

We conclude that Petitioner has shown by a preponderance of the evidence that claim 4, which depends from claim 1, is unpatentable as obvious over Sheesley. We also conclude that Petitioner has shown by a

preponderance of the evidence that claim 13, which depends from claims 11 and 12, is unpatentable as obvious over Sheesley and ISO 1496-1.

7. Dependent Claims 5 and 16

Claim 5 recites “tracking the amount of proppant on hand at the desired location with bar-codes or logging mechanisms” and claim 16 similarly recites “tracking the amount of proppant on hand at a location with bar-codes or logging mechanisms.” Petitioner contends that such tracking would have been obvious in light of the importance of proppant to the fracking operation and “the industry’s widespread adoption of precisely this practice.” *Id.* at 74–76 (citing Ex. 1004 ¶ 202). Mr. Schaaf supports Petitioner’s contention, but his opinion is of limited value, because his opinion fails to disclose what it is based upon and identifies no supporting evidence. *See* Ex. 1004 ¶ 207 (opining without identifying any support that “logging such information through bar codes was extremely common in the industry”). We conclude that Petitioner has not shown that Sheesley, alone, teaches the requirements of claim 5, or that Sheesley and ISO 1496–1, together teach the requirements of claim 16.

Alternatively, Petitioner also contends as follows: (1) Sheesley utilizes modified standard cargo containers governed by ISO standards, (2) ISO 6346 “provides for marking each ISO container with a unique code,” and (3) ISO 15416 “provides for a standardized methodology governing bar codes.” Pet. 75. Petitioner reasons, and we adopt as our own findings, as follows:

In particular, ISO 6346 provides for marking each ISO container with a unique code. Ex. 1011 3. ISO 6346 further provides that containers may be marked with “maximum payload, or net mass.” Ex. 1011 5.2. [A person of ordinary skill

in the art] would understand that Sheesley's standard cargo containers may be marked in accordance with ISO 6346, and that these codes could be used to communicate information about the proppant containers, including amount of proppant. Ex. 1004 ¶205. [A person of ordinary skill in the art] would further understand that these codes may be logged, including with a logging mechanism. Ex. 1004 ¶205. Further, ISO 15416 provides for a standardized methodology governing bar codes. Ex. 1012 1. [A person of ordinary skill in the art] would understand that standard cargo containers may be tracked using bar codes, as this method of tracking is contemplated and regulated by the ISO, which promulgates regulations for standard cargo containers. Ex. 1004 ¶206. Further, [a person of ordinary skill in the art] would understand that the bar codes taught by ISO 15416 may be used to track an amount of proppant in a container. Ex. 1004 ¶206. [A person of ordinary skill in the art] would be motivated to combine the modified container disclosed in Sheesley with the tracking capabilities disclosed in the ISO standards. Ex. 1004 ¶207. Sheesley discloses using a container modified from a standard cargo container. Ex. 1003 ¶[0002]-¶[0004]; ¶[0016]; ¶[0050]. The ISO promulgates standards that govern standard cargo containers. Ex. 1011 1.1. Moreover, [a person of ordinary skill in the art] would expect reasonable success in combining Sheesley's modified containers with standards promulgated by the ISO, because logging such information through bar codes was extremely common in the industry. Ex. 1004 ¶207.

Id. at 75–76. Patent Owner does not dispute Petitioner's contentions with regard to claims 5 and 16.

We conclude that Petitioner has shown by a preponderance of the evidence that claim 5, which depends from claim 1, is unpatentable as obvious over Sheesley, ISO 6346, and ISO 15416. We also conclude that Petitioner has shown by a preponderance of the evidence that claim 16, which depends from claim 11, is unpatentable as obvious over Sheesley, ISO 1496-1, ISO 6346, and ISO 15416.

8. Dependent Claims 7 and 17

Claims 7 and 17 recite “tracking the mesh size of the proppant in the containers at the location with bar-codes or logging mechanisms.” For the reasons provided above, Petitioner has shown that it would have been obvious in light of Sheesley, ISO 6346, and ISO 15416 to track the *amount* of proppant on hand at the desired location with bar-codes or logging mechanisms, as required by claims 5 and 16. Petitioner further explains in the Petition that Sheesley teaches that the type of sand used in fracking is “very critical,” and further reasons that a person of ordinary skill in the art would have understood that in addition to the amount of proppant on hand, it also would have been obvious to a person of ordinary skill in the art to track information about the proppant in the containers, including mesh size, “because the characteristics of the proppant is critical to the fracking process and there may be multiple types of proppant at the fracking site.” *Id.* at 76–77 (citing Ex. 1004 ¶ 209; Ex. 1003 ¶ 10).

Patent Owner argues that merely showing that a person of ordinary skill “could” have modified the asserted prior art to render claims 7 and 17 obvious is “legally insufficient,” and that Petitioner “provided no rationale or articulated reasoning” to show why such a modification would have been made. PO Resp. 50–51; PO Sur-Reply 28. We disagree.

Petitioner has persuasively shown that a person of ordinary skill would have been motivated to track “the mesh size of the proppant in the containers at the location with bar-codes or logging mechanisms,” precisely because the type of proppant used is critical to the process and there may be more than one type of proppant on a site. We conclude that Petitioner has shown by a preponderance of the evidence that claim 7, which depends from

claim 1, is unpatentable as obvious over Sheesley, ISO 6346, and ISO 15416. We also conclude that Petitioner has shown by a preponderance of the evidence that claim 17, which depends from claim 11, is unpatentable as obvious over Sheesley and ISO 1496-1, ISO 6346, and ISO 15416. Petitioner, however, has not shown that Sheesley, alone, teaches the requirements of claim 7, or that Sheesley and ISO 1496-1, together teach the requirements of claim 17, for the same reasons explained above with regard to claims 5 and 16.

9. Dependent Claims 8 and 18

Claims 8 and 18 further recite “staging a plurality of empty containers at a proppant site.” Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches this limitation, including that modified containers may be filled with proppant from the source such that a person of ordinary skill in the art would have known that to fill containers, empty containers must be at the site. Pet. 77 (citing Ex. 1003 ¶¶ 17, 19, 42, 49, 77, 78, 84, 85, Figs. 1, 5, 7, 8; Ex. 1004 ¶¶ 211–12).

We conclude that Petitioner has shown by a preponderance of the evidence that claim 8, which depends from claim 1, is unpatentable as obvious over Sheesley. We also conclude that Petitioner has shown by a preponderance of the evidence that claim 18, which depends from claim 11, is unpatentable as obvious over Sheesley and ISO 1496-1.

10. Dependent Claim 9

Claim 9 recites, in part, positioning the outlet in a “substantially central portion of the bottom of the container.” Petitioner has shown (and Patent Owner does not dispute) that Sheesley teaches an opening

approximately centered in the bottom of the container. *Id.* at 56, 57, 78; Ex. 1003 ¶¶ 16, 21, 50, 57, Fig. 15.

Claim 9 further recites “a plurality of horizontal structural members extending between the plurality of structural uprights.” The “horizontal structural members” limitation of claim 9 was discussed above in regard to Petitioner’s contentions with respect to the recited “structural support members” of claim 1, from which claim 9 depends. Petitioner has shown that Sheesley teaches horizontal supports corresponding, as illustrated in red in Petitioner’s annotated version of Sheesley Figure 9, which correspond to both the “structural support members” limitation of claim 1 and the more narrow “horizontal structural members” limitation of claim 9. *See* Pet. 59, 60, 79. Patent Owner does not advance any additional arguments concerning claim 9 beyond the arguments also made with regard to claim 1, discussed above. *See* PO Resp. 38–40; PO Sur-Reply 16–22. We conclude that Petitioner has shown by a preponderance of the evidence that claim 9, which depends from claim 1, is unpatentable as obvious over Sheesley.

11. Dependent Claim 10

Claim 10 recites that the loader/unloader “comprises a forklift” which is positioned in slots in the container for positioning the container. This additional limitation is substantially the same as what is required in claim 11, discussed above, and Petitioner relies on the same contentions for both claim 10 and claim 11. Pet. 66–68, 80. Patent Owner does not advance any additional arguments concerning claim 10 beyond the arguments made with regard to claim 11, discussed above. *See* PO Resp. 41–46, 51–52. For the same reasons provided above with regard to the similar limitation of claim 11, we conclude that Petitioner has shown by a preponderance of the

evidence that claim 10, which depends from claim 1, is unpatentable as obvious over Sheesley and ISO 1496-1, but not over Sheesley, alone.

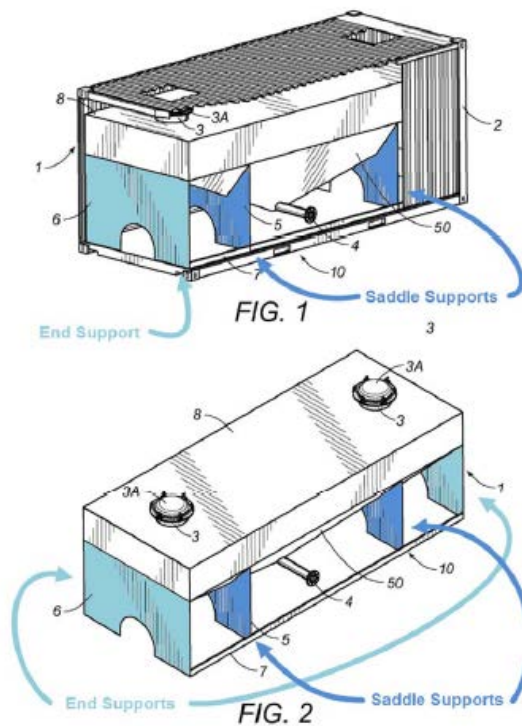
F. Alleged Obviousness Over Mintz, Alone, or Over Combinations of Mintz and ISO Standards

Petitioner contends that the subject matter of claims 1, 3, 5–8, 10–12, and 15–19 would have been obvious over Mintz, alone, or in combination with ISO Standards. Pet. 19–49, 81. As explained above, ISO Standards consists of three separate prior art references—ISO 1496-1, ISO 6346, and ISO 15416—and we understand Petitioner’s contentions as to each challenged claim to be based on the particular ISO standards expressly alleged in the Petition to be applicable to the recited limitations. *See, e.g., id.* at 44–46 (expressly applying Mintz, ISO 6346, and ISO 15416 to claims 5 and 16 with “bar-codes or logging mechanism” limitations).

Claim 1 recites, among other things, “the structural integrity of the plurality of containers being enhanced by a plurality of structural uprights positioned to extend from the bottom to the top of each of the plurality of containers.” Claim 11 recites “each of the plurality of containers has a plurality of structural uprights positioned to extend from the bottom to the top of each of the plurality of containers.” Petitioner relies on the same arguments to show both limitations of claims 1 and 11 would have been obvious over the asserted prior art. *Id.* at 43; Ex. 1004 ¶ 118.

Petitioner contends that Mintz discloses “brace and truss support assembly 10,” which “comprises each of pair of longitudinal basal cross-braces 7 fixedly interconnected at each end thereof with one of pair of end supports 6 and intermediately thereof with plurality of saddle supports 5.” Pet. 23 (quoting Ex. 1002, 4:56–61).

Petitioner provides annotated versions of Figures 1 and 2 of Mintz, reproduced below.



Id. at 24. Annotated Figure 1 illustrates a perspective view and annotated Figure 2 illustrates an isometric view of frac sand transport apparatus 1, including saddle supports 5 (shown in dark blue), end supports 6 (shown in light blue), and roof 8. *Id.*; Ex. 1002, 4:46–51. Frac sand transport apparatus 1 is within intermodal container 2, only partially shown in Figure 1.

According to Petitioner, “these end supports and saddle supports are structural uprights positioned to extend from the bottom to the top of each of the plurality of containers.” Pet. 23–24. Mr. Schaaf supports Petitioner’s contention, but provides no additional explanation and identifies no other evidence to support his opinion. Ex. 1004 ¶¶ 73–74. As we noted in our

Institution Decision, Petitioner does not explain in the Petition how a person of ordinary skill would have understood from Figures 1 and 2 that saddle supports 5 or end supports 6 are “positioned to extend from the bottom to the top” of the container, as recited by claims 1 and 11, when Petitioner’s annotated figures clearly show the saddle supports and end supports do not reach the top of the container. *See* Inst. Dec. 32–33. In its Response, Patent Owner raises the same argument, asserting that “Mintz’s end supports and saddle supports do not extend from the bottom to the top of its container as claimed.” PO Resp. 21.

Petitioner first argues in reply that “positioned to extend from the bottom to the top” means nothing more than to “extend vertically.” Pet. Reply 6, 19. Thus, Petitioner reads out of the claims any requirement of proximity to the bottom or the top, and instead reads it as only an indication of direction. Petitioner did not propose such an express definition in the Petition and identifies no persuasive evidence to support that such a broad construction would have been reasonable. Nor has Petitioner directed us to any disclosure in the ’815 patent to suggest that an element that does not reach the top of the container nevertheless is “positioned to extend from the bottom to the top,” as required.

Second, Petitioner argues that because Sheesley and Mintz both teach the use of a modified ISO shipping container, and because Petitioner argued in the Petition that the corner posts of the container taught by Sheesley correspond to the claimed “structural uprights,” Mintz must also teach this limitation. *Id.* at 18–20. Petitioner does not direct us to any place in the Petition to show that this argument was properly raised, much less supported by Mr. Schaaf or any other evidence of record. We determine that

Petitioner's argument, first raised in its Reply, is improper under Rule 42.23(b) which provides that a "reply may only respond to arguments raised in the corresponding opposition or patent owner response." *See also Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369–70 (Fed. Cir. 2016); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,767 (Aug. 14, 2012) (explaining that a "reply that raises a new issue or belatedly presents evidence will not be considered"). We conclude that Petitioner has not properly shown by a preponderance of the evidence that Mintz teaches a "plurality of structural uprights positioned to extend from the bottom to the top of each of the plurality of containers," as required by both independent claims challenged by Petitioner. Accordingly, Petitioner has not shown that any claim of the '815 patent would have been obvious over Mintz, alone, or in combination with ISO Standards.

IV. CONCLUSION

Weighing the evidence of the disclosure of the references, the competing testimony, and the reasoning to combine the references, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–5 and 7–18 of the '815 patent are unpatentable. Petitioner has not shown that claims 6 and 19 of the '815 patent are unpatentable.⁷

⁷ 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).

Our final determination in this case is summarized in the table below:

Claims	35 U.S.C. §	Reference(s)	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 7–18	103	Sheesley	1–4, 8, 9	5, 7, 10–18
10–18	103	Sheesley, ISO 1496-1	10–15, 18	16, 17
5, 7	103	Sheesley, ISO 6346, ISO 15416	5, 7	
16, 17	103	Sheesley, ISO 1496-1, ISO 6346, ISO 15416	16, 17	
1, 3, 5–8, 10–12, 15–19	103	Mintz		1, 3, 5–8, 10–12, 15–19
1, 3, 5–8, 10–12, 15–19	103	Mintz, ISO 1496-1		1, 3, 5–8, 10–12, 15–19
5, 7, 16, 17	103	Mintz, ISO 6346, ISO 15416		5, 7, 16, 17
5, 7, 16, 17	103	Mintz, ISO 1496-1, ISO 6346, ISO 15416		5, 7, 16, 17
Overall Outcome			1–5, 7–18	6, 19

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–5 and 7–18 of the '815 patent have been shown to be unpatentable;

FURTHER ORDERED that claims 6 and 19 of the '815 patent have not been shown to be unpatentable; and

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

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