

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARROWS UP, LLC,
Petitioner,

v.

OREN TECHNOLOGIES, LLC,
Patent Owner.

IPR2018-01231
Patent 9,617,066 B2

Before KEVIN W. CHERRY, MICHAEL L. WOODS, and
PAUL J. KORNICZKY, *Administrative Patent Judges*.

WOODS, *Administrative Patent Judge*.

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

I. INTRODUCTION

Arrows Up, LLC (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of all claims (claims 1–6) of U.S. Patent No. 9,617,066 B2 (“the ’066 patent”). Pet. 1. We issued a decision to institute an *inter partes* review of these claims. Paper 7.

After institution, Oren Technologies, LLC (“Patent Owner”) filed a Patent Owner Response (Paper 14, “PO Resp.”), to which Petitioner replied (Paper 22, “Pet. Reply”). Patent Owner also filed a Sur-Reply to Petitioner’s Reply. Paper 24, “PO Sur-Reply.”

Oral argument was held on October 17, 2019, and the transcript of the hearing has been entered as Paper 29.

We have jurisdiction under 35 U.S.C. § 6. 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); 37 C.F.R. § 42.1(d). 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 1, 2, and 4–6 of the ’066 patent are unpatentable. See 35 U.S.C. § 316(e). Petitioner has not shown that claim 3 is unpatentable.

A. Related Proceedings

Petitioner identifies the following *inter partes* review proceedings that involve patents that claim priority to the ’066 patent: IPR2017-01917,

IPR2017-01918, IPR2017-02103, and IPR2018-00914. Pet. 74. Petitioner also identifies the following lawsuits: *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.). *Id.*

In addition, we note that Petitioner has filed petitions in the following proceedings requesting institution of *inter partes* review of additional patents with priority claims that overlap that of the '066 patent: IPR2018-01230, IPR2018-01232, and IPR2018-01233.

B. The '066 Patent (Ex. 1001)

The '066 patent is titled “Method for Delivering, Transporting, and Storing Proppant for Delivery and use at a Well Site.” Ex. 1001, code (54). Proppant is a material, such as sand, used in hydraulic fracturing (also known as “fracking” or “fracing”). *Id.* at 1:35–49. Hydraulic fracturing is the propagation of fractures in rock layers to release for extraction fossil fuels, such as petroleum, natural gas, and coal. *Id.* at 1:36–41. The injection of proppant into the rock fractures helps to prevent the fractures from closing. *See id.* at 1:45–49. Typically, large amounts of proppant are required during hydraulic fracturing. *Id.* at 2:3–4. There is a need to ensure proppant is available during fracturing operations; otherwise, fracturing may stall. *Id.* at 2:33–40.

The '066 patent describes a system for delivering proppant that purports to enhance productivity (*id.* at 4:55), reduce liabilities (*id.* at 4:60–61), improve safety (*id.* at 4:64), and increase profits (*id.* at 5:3). To

illustrate an embodiment of the '066 patent, we reproduce its Figure 3, below:

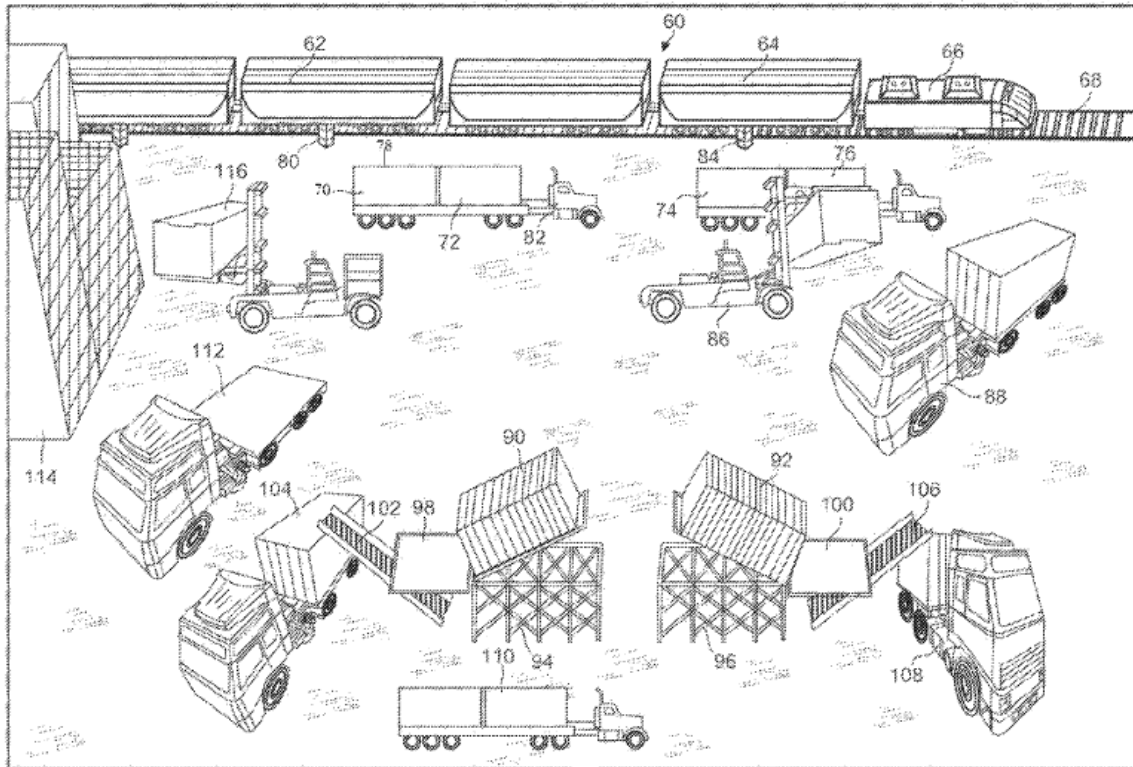


FIG. 3

According to the '066 patent, Figure 3 illustrates system 60 “of the present invention.” *Id.* at 6:39–40, 8:8. Bulk material train 64 transports proppant to a desired location via vessel 62. *Id.* at 8:8–10. The proppant is then unloaded into containers 70, 72, 74, 76, which may be supported on a bed of a truck. *Id.* at 8:26–36. Loader/unloader 86 moves containers 70, 72, 74, 76 as needed. *Id.* at 8:41–43. Containers 114 are shown stacked and empty, but filled containers may also be stacked. *Id.* at 9:11–22.

To illustrate one of the '066 patent's containers, we reproduce Figure 1, below:

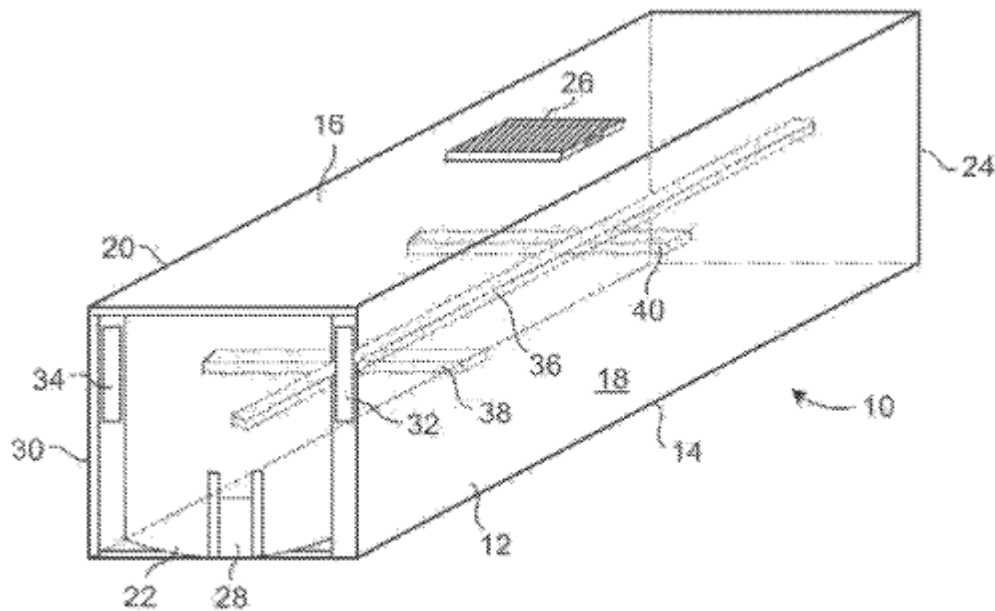


FIG. 1

As shown in the above Figure 1, container 12 has bottom wall 14, top wall 16, side walls 18, 20, and end walls 22, 24. *Id.* at 6:46–49. As can also be seen, end wall 22 is recessed inwardly and has a generally convex shape. *Id.* at 6:62–67.

C. Illustrative Claim

Claim 1 is the sole independent claim and is reproduced below, with emphases added to limitations for which Patent Owner disputes Petitioner's unpatentability showing:

1. A method of loading and transporting proppant, the method comprising:
 - a) *positioning a plurality of empty proppant containers, each removably positioned on a trailer of a respective proppant transporting road vehicle and structurally strengthened to receive a large volume of proppant having a substantially spherical shape therein, in close proximity to a rail spur so that*

each of the plurality of empty proppant containers underlies a source of proppant received from rail cars on the rail spur, each of the plurality of empty containers including at least *a first end surface and at least a second different end surface* and each of the first and second end surfaces having a plurality of upright structural support members thereon to enhance integrity of the container for stacking and so that heavy weight from the proppant can be stored therein;

b) filling the plurality of empty proppant containers with proppant thereby to produce a plurality of proppant filled containers, the plurality of empty proppant containers being filled when positioned on the respective trailer of the respective proppant transporting road vehicles;

c) transferring the plurality of proppant filled containers with one or more proppant transporting road vehicles to a drill site; and

d) unloading each of the plurality of proppant filled containers with an unloader.

Ex. 1001, 10:48–11:8 (emphases added).

D. References and Expert Testimony

Reference/Expert Testimony	Date	Exhibit No.
US 2013/0206415 A1 (“Sheesley”)	Aug. 15, 2013	1005
US 8,915,691 B2 (“Mintz”)	Dec. 23, 2014	1006
US 5,290,139 (“Hedrick”)	Mar. 1, 1994	1007
Schaaf Declaration		1002
Smith Declaration		2009
Schaaf Cross-Examination		2011
Smith Cross-Examination		1016

E. Alleged Grounds of Unpatentability

Petitioner contends that all claims (claims 1–6) of the '066 patent are unpatentable under 35 U.S.C. § 103(a)¹ based on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–6	103(a)	Sheesley, Mintz
1, 2, 4–6	103(a)	Sheesley
3	103(a)	Sheesley, Mintz, Hedrick

II. ANALYSIS

A. POSITA

Petitioner proposes that a person having ordinary skill in the art (“POSITA”) would have had either (a) 1–2 years of experience in hydraulic fracturing and logistical support of fracking operations and a bachelor’s degree in an engineering or logistics discipline, or (b) 4–5 years of experience in hydraulic fracturing and logistical support for fracking operations. *See* Pet. 7 (citing Ex. 1002 ¶ 40).

Patent Owner does not propose a level of ordinary skill in the art. *See generally* PO Resp.

We adopt Petitioner’s proposed level of ordinary skill in the art “because it is consistent with the problems and solutions in the prior art of record.” *See Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007) (“Factors that may be considered in determining level of ordinary

¹ 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 '066 patent has an effective filing date before March 16, 2013, the pre-AIA version of § 103 applies.

skill in the art include: (1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.”).

B. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2017); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard).² A presumption exists that a claim term should be construed in light of its ordinary and customary meaning. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). “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).

² The revised claim construction standard for interpreting claims in *inter partes* review proceedings as set forth in the final rule published October 11, 2018, does not apply to this proceeding, because the new “rule is effective on November 13, 2018, and applies to all IPR, PGR, and CBM petitions filed on or after the effective date.” Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (now codified at 37 C.F.R. pt. 42 (2019)).

Petitioner states that no claim term requires express construction. Pet. 8. Patent Owner, on the other hand, proposes an interpretation of “a second different end surface.” PO Resp. 10.

1. “*second different end surface*”

Claim 1 recites, *inter alia*, “a first end surface and at least a second different end surface.” Ex. 1001, 10:58–59.

In our decision to institute, we determined that “a broad, but reasonable construction of the claimed ‘second different end surface’ limitation requires that this surface is structurally different from the ‘first end surface.’” Paper 7, 9.

Petitioner does not dispute our construction. *See generally* Pet. Reply.

Patent Owner agreed with our construction. PO Resp. 10 (“The evidence shows the Board’s construction is correct and should be maintained.”).

Upon reviewing the claim language in light of the Specification, we maintain our interpretation that a reasonable construction of the claimed “second different end surface” limitation requires that this surface be structurally different from the “first end surface,” for the reasons given in our decision to institute. *See* Paper 7, 8–9.

2. *Other Claim Terms*

We determine that no other claim limitation requires express construction for purposes of this Decision. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only

be construed ‘to the extent necessary to resolve the controversy.’” (internal citation omitted)).

C. Prior Art

1. Sheesley (Ex. 1005)

Sheesley is titled “Method and Apparatus for Modifying a Cargo Container to Deliver Sand to a Frac Site” and describes cargo containers for carrying “proppant such as sand from a quarry or source to the frac site.” Ex. 1005, codes (54), (57). In particular, Sheesley discloses a method whereby “cargo containers may be taken directly to the quarry and loaded with sand . . . [and 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 Sheesley’s method, we reproduce its Figure 2, below:

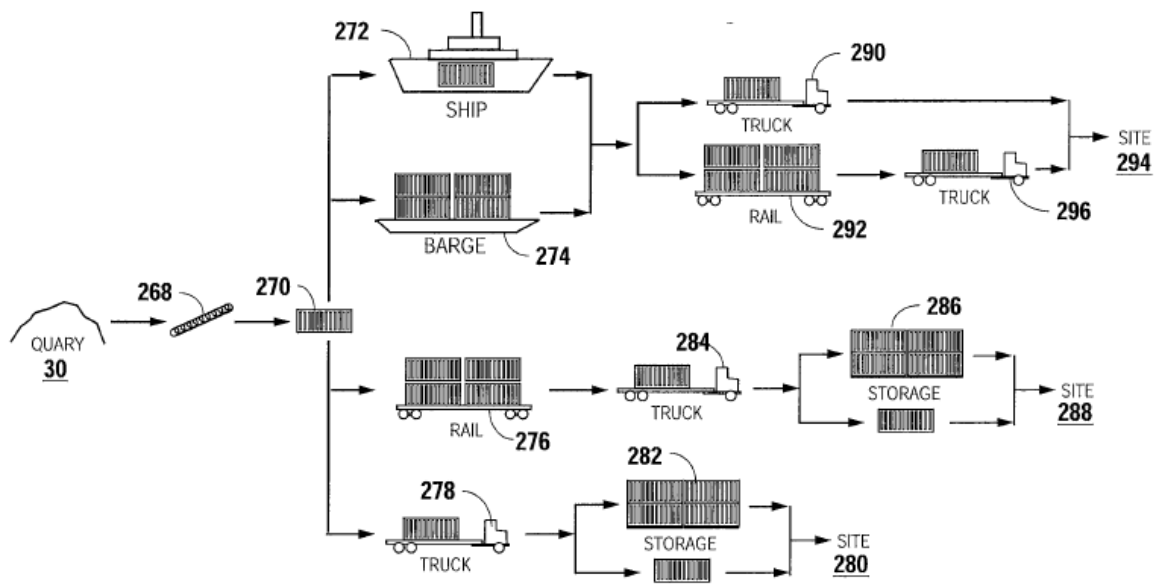


Fig. 2

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 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.

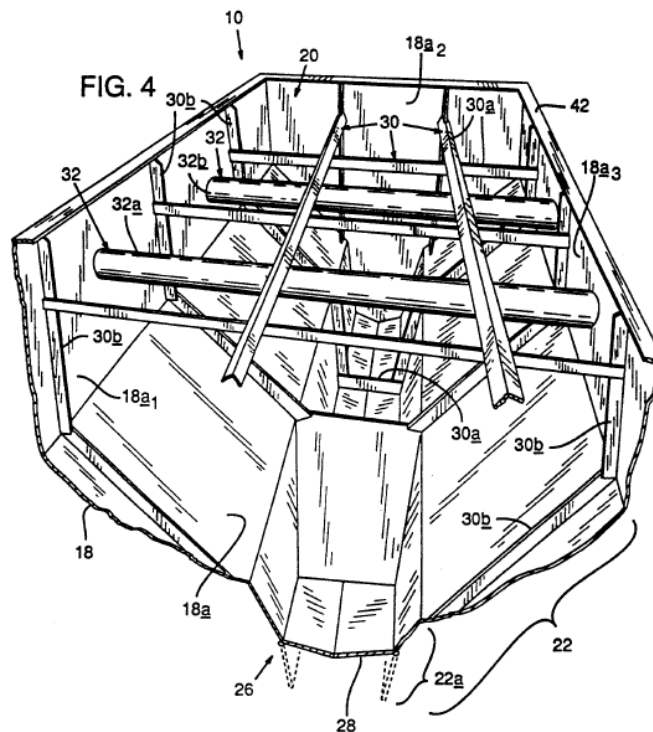
Sheesley further discloses that the containers can be stacked and that a cargo handler can be used to pick up full or empty containers. *Id.* ¶ 83 (referencing Figs. 3, 4).

2. *Mintz (Ex. 1006)*

Mintz is titled “Apparatus for Transporting Frac Sand in Intermodal Container” and describes “internal structure adapted to support and strengthen walls and floor of” standard International Organization for Standardization (“ISO”) shipping containers. Ex. 1006, code (54), 1:65–67. 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.

3. *Hedrick (Ex. 1007)*

Hedrick is titled “Portable Hopper with Internal Bracing.” Ex. 1007, code (54). Hedrick discloses, in relevant part, a hopper with internal bracing, as shown in Figure 4, reproduced below:



According to Hedrick, Figure 4 depicts hopper 10 that defines bulk-material storage space 20. *Id.* at 4:41–45. Hopper 10 also includes internal bracing structure 30, which is alternatively referred to as space truss structure, and which promotes self-supportability of the hopper when loaded with material such as sand. *Id.* at 5:3–10.

D. Ground 1: Claims 1–6 as Unpatentable over Sheesley and Mintz

Petitioner submits that claims 1–6 are unpatentable as obvious over Sheesley and Mintz. Pet. 24. Below, we address Petitioner’s and Patent Owner’s contentions for each of these claims.

1. Independent Claim 1

Petitioner relies primarily on Sheesley for disclosing a method of loading and transporting proppant (Pet. 24), including the majority of the claimed features (*id.* at 24–41).

a. positioning a plurality of empty proppant containers, each removably positioned on a trailer of a respective proppant transporting road vehicle

Petitioner asserts that Sheesley discloses this limitation and cites to Sheesley’s Figure 5, which depicts multiple cargo containers sitting on a *rail car* (Pet. 25–26 (citations omitted)), and to Sheesley’s disclosure that its cargo containers can “move through all of the normal modes of transportation including . . . *by truck.*” *Id.* at 25 (citing Ex. 1005 ¶ 78 (emphasis omitted)).

Regarding the claimed “removably positioned,” Petitioner cites to Sheesley’s disclosure that its containers can be taken directly to the fracing

site or placed in storage, as shown in Sheesley's Figure 2. *Id.* at 26 (citing Ex. 1005 ¶ 79).

Patent Owner contends that Sheesley *does not* disclose “positioning a plurality of *empty* proppant containers . . . on a trailer of . . . proppant transporting road vehicles.” PO Resp. 14 (emphasis added). Specifically, Patent Owner contends that Sheesley “makes clear that Sheesley is discussing full containers, not empty ones” (*id.* at 15 (citing Ex. 1005 ¶ 17)) and asserts that “once the containers are loaded with sand, only ‘then’ can they be transported by truck to the frac site” (*id.* at 15–16 (citing Ex. 2009 ¶¶ 36–37)).

We disagree with Patent Owner's narrow interpretation of Sheesley. “A reference must be considered for everything that it teaches, not simply the described invention or a preferred embodiment.” *In re Applied Materials, Inc.*, 692 F.3d 1289, 1298 (Fed. Cir. 2012). When read in its entirety, Sheesley teaches the claimed limitation. To illustrate this point, we begin by reproducing Sheesley's Figure 5, below:

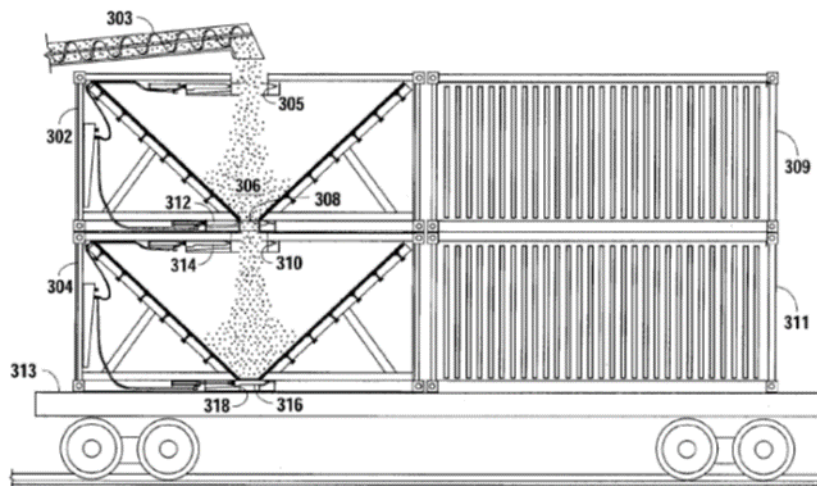


Fig. 5

Figure 5 depicts *empty* containers being filled with proppant after being placed on a *rail car* for transport. Although Figure 5 depicts the empty containers placed on a *rail car*, rather than on a *road vehicle*, as required by the claim, Sheesley’s disclosure is not limited to rail cars, as Patent Owner contends. Specifically, Sheesley discloses that rail is merely one of many modes of transportation, including trucks. Ex. 1005 ¶ 78 (“Modified cargo containers **270** can be loaded on a ship **272**, barge **274**, rail **276**, or a flatbed truck trailer **278**”). For the reasons discussed above, and after having weighed the competing testimony of Petitioner’s expert (Mr. Robert Schaaf (Ex. 1002)) and Patent Owner’s expert (Mr. Fred P. Smith (Ex. 2009)), we credit Mr. Schaaf’s testimony that Sheesley discloses this limitation. Ex. 1002 ¶¶ 71–78; *see id.* ¶ 78 (“[I]t is my opinion that Sheesley discloses ‘positioning a plurality of empty proppant containers, each removably positioned on a trailer of a respective proppant transporting road vehicle.’”).

Accordingly, Petitioner has shown that Sheesley discloses “positioning a plurality of empty proppant containers . . . on a trailer of . . . proppant transporting road vehicle.”

b. structurally strengthened to receive a large volume of proppant having substantially spherical shape therein

Petitioner asserts that Sheesley discloses this limitation, citing to Sheesley’s claim 15, which recites “[a] method for delivering proppant such as sand to a site of a well being fraced” and “loading said proppant into” containers. Pet. 27. As to the claimed “proppant having substantially spherical shape,” Petitioner cites to Mr. Schaaf’s testimony that a “POSITA would understand that the sand described in Sheesley . . . would necessarily

and inherently be spherical in shape.” *Id.* at 27–28 (citing in relevant part Ex. 1002 ¶ 80).

Petitioner has shown that Sheesley discloses this limitation.

c. in close proximity to a rail spur so that each of the plurality of empty proppant containers underlies a source of proppant received from rail cars on the rail spur

Petitioner asserts that Sheesley discloses this limitation, citing Sheesley’s claim 21, which recites in part “[a] method for delivering proppant to the site of a well being fraced . . . wherein said source may be any point along a supply chain of said proppant.” Pet. 30. According to Petitioner (*id.*), and as Mr. Schaaf testifies, “a POSITA would understand that one of the potential sources ‘along a supply chain of said proppant’ in Sheesley would be at a rail spur or rail vehicle” (Ex. 1002 ¶ 85).

As shown in Sheesley’s Figure 2 (reproduced *supra* Part II.C.1), and described in Sheesley’s paragraph 78, Sheesley discloses that “sand from the sand quarry 30 *or source* can now be loaded by a conveyor 268 to a modified cargo container [270] . . . [, which] can be loaded on a . . . flatbed truck trailer.” Ex. 1005 ¶ 78 (emphasis added).

As also shown in Sheesley’s Figure 5 (reproduced *supra* Part II.D.1.a), Sheesley depicts empty containers receiving sand from auger 303.

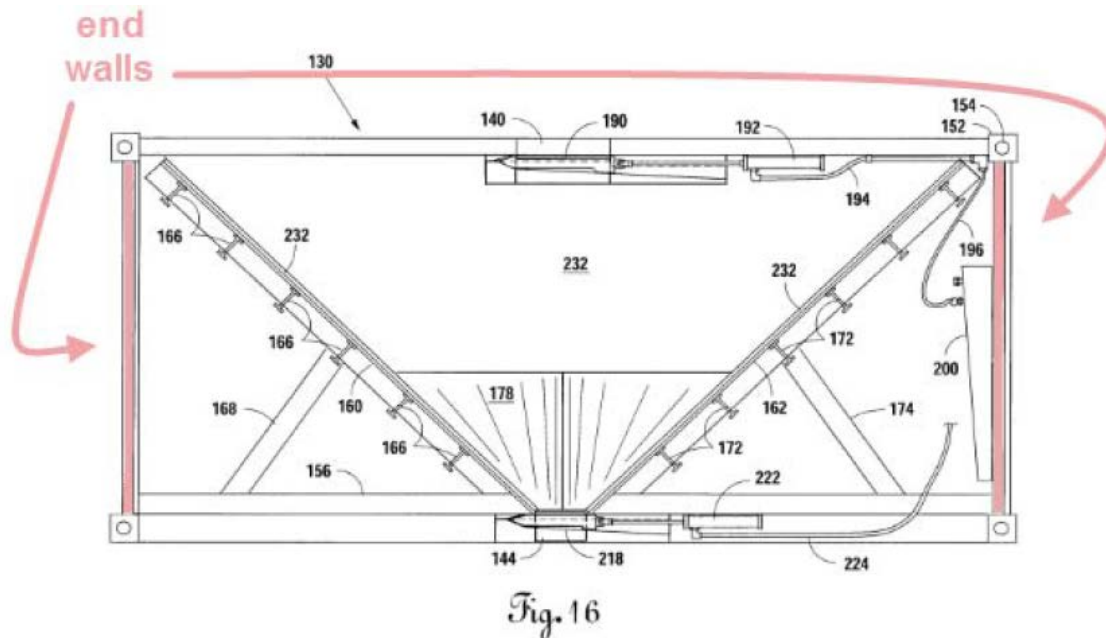
Based in part on these figures and their associated descriptions, we credit Mr. Schaaf’s testimony that “a POSITA at the time would understand Sheesley’s auger could provide proppant received from a rail car on the rail spur (the ‘source’ on the supply chain of proppant) into Sheesley’s empty proppant containers, and that such containers would necessarily be in ‘close

proximity' to the rail spur.” Ex. 1002 ¶ 87.

Petitioner has shown that Sheesley discloses this limitation.

- d. *each of the plurality of empty containers including at least a first end surface and at least a second different end surface*

Petitioner asserts that Sheesley discloses this limitation, and submits an annotated version of Sheesley’s Figure 16 (Pet. 32), which we reproduce, below:



According to Petitioner, Sheesley’s Figure 16 depicts two end walls that extend between the bottom, top, and side walls of the container. *Id.* (citations omitted). Petitioner further cites to the presence of doors 132 and 134, as shown in Figure 9 (*id.*) and to the presence of control panel 200 (see Pet. Reply 7 (“These control panels provide an additional structural difference between the front wall and the back wall”); see also Ex. 1005 ¶ 56 (associating reference numeral 200 as a control panel)).

Patent Owner contends that Sheesley *does not* disclose the claimed “second different end surface.” PO Resp. 23. Specifically, Patent Owner asserts that “[o]nly one of the alleged ‘end walls’ in Sheesley’s Figure 9 has even been given a reference number. And neither of the alleged ‘end walls’ of Figure 16 depict reference numbers.” *Id.* at 25–26. Patent Owner argues that “there is no discussion of this aspect of the container shown in Figure[] 9 or 16 or Sheesley from which the Board could find that this unreferenced ‘end wall’ was not the same as the ‘end wall’ labeled with, *inter alia*, doors 132 and 134 in Figure 9.” *Id.* at 26.

We disagree with Patent Owner. Rather, we find that Sheesley discloses this limitation, and to illustrate our findings, we begin by reproducing Sheesley’s Figure 9, below:

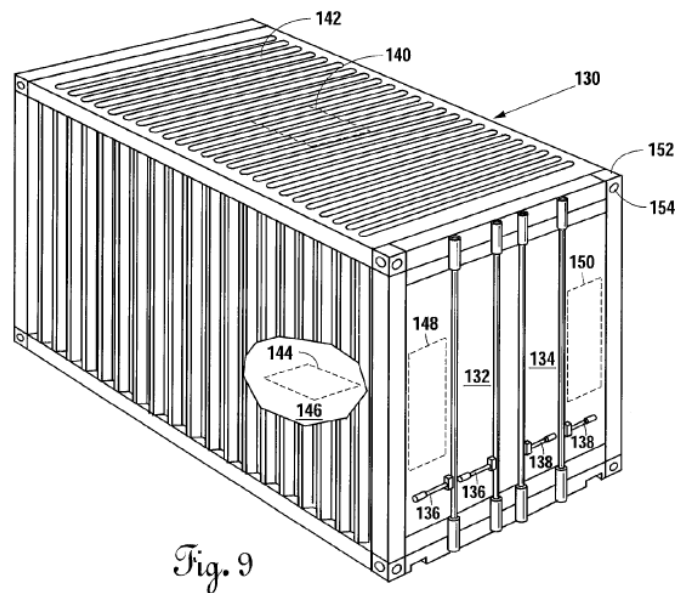


Figure 9 “is a pictorial view of a cargo container illustrating where openings should be cut.” Ex. 1005 ¶ 27. Sheesley further discloses that “cargo container **130** is made out of corrugated metal and has doors **132** and **134**, *on the one end thereof*.” Ex. 1005 ¶ 50 (italicized emphasis added). Sheesley

also discloses, “Control panel openings **148** and **150** are cut in doors **132** and **134**, respectively.” *Id.*

Sheesley discloses doors “on one end thereof,” which we understand to mean that doors are only present on one end of the container—not both ends. *Id.* The presence of doors on only one end of the container satisfies the claimed limitation of a “second different end surface.”

Moreover, and as shown above in Petitioner’s annotated version of Sheesley’s Figure 16, reproduced above, control panel 200 is only shown on one end of the container. The presence of control panel 200, along with its associated openings 148, 150 (shown in Figure 9), on only one end of the container further meets the claimed limitation of a second different end surface. Ex. 1005, Fig. 16; *see also id.* at Fig. 15 (depicting control panel 200 on door 134).

Accordingly, Petitioner has shown that Sheesley discloses this limitation.

e. each of the first and second end surfaces having a plurality of upright structural support members thereon to enhance integrity of the container for stacking and so that heavy weight from the proppant can be stored therein

Petitioner asserts that Sheesley discloses this limitation and submits an annotated version of Sheesley’s Figure 9 (Pet. 33), which we reproduce, below:

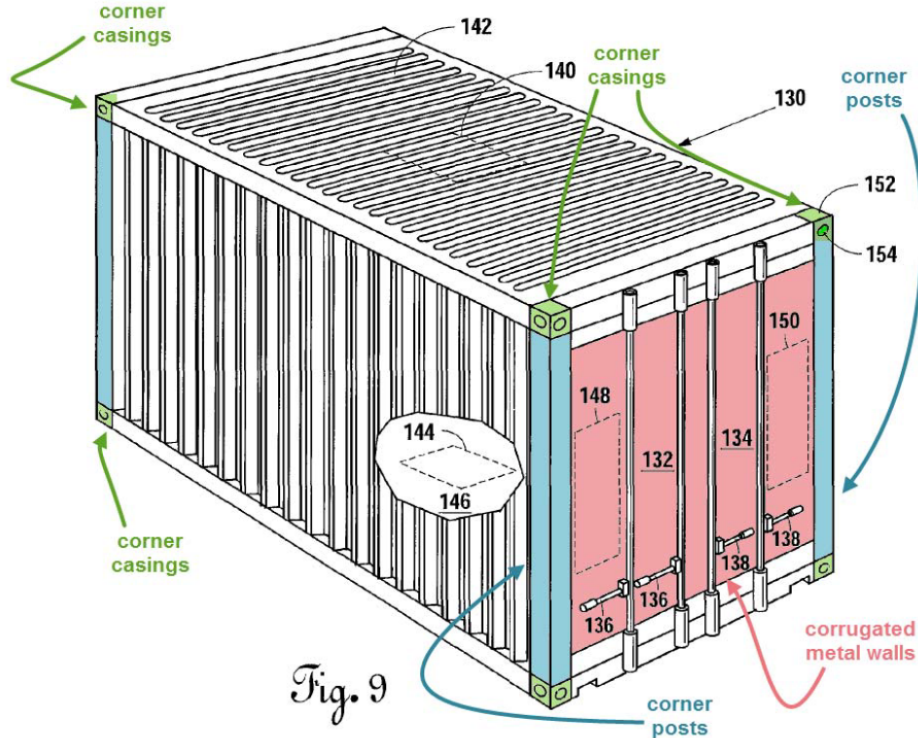


Figure 9 depicts “a cargo container illustrating where openings should be cut.” Ex. 1005 ¶ 27. According to Petitioner, and as shown in the above annotated Figure 9, Sheesley’s end walls include a plurality of vertical support members (corner castings 152 with corner posts) for enhancing the container’s integrity for stacking and for storing proppant. Pet. 33–35 (referencing in part Ex. 1011, 23).

In the alternative, Petitioner also relies on Mintz for disclosing this limitation, citing Mintz’s disclosure that its container’s external frame “should preferably be reinforced with appropriate bracing and trusses.” *Id.* at 35 (citing Ex. 1006, 2:25–31, 2:49–67, 5:1–6). Petitioner submits an annotated version of Mintz’s Figure 2 (*id.* at 36), which we reproduce, below:

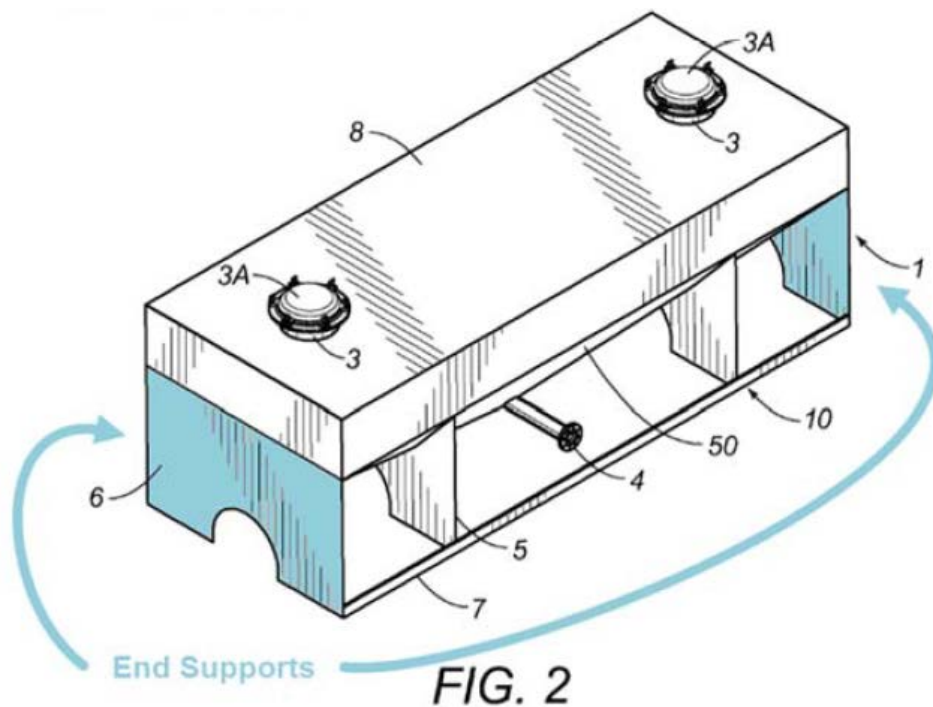


Figure 2 depicts a side view of an embodiment of Mintz’s invention. Ex. 1006, 3:43–46. According to Petitioner, Mintz’s Figure 2 illustrates brace and truss support assembly 10 with cross-braces 7, end supports 6, and saddle supports 5. *See id.* at 35 (citing in part Ex. 1006, 4:56–61).

In combining Sheesley with Mintz, Petitioner reasons that a “POSITA would understand that Sheesley’s container could receive further structural support when combined with the braces and trusses disclosed in Mintz” and that the combination would have predictably yielded an “improved structural support for the container holding the proppant.” *Id.* at 66 (citing Ex. 1002 ¶¶ 162, 163).

Petitioner has shown that Sheesley alone *and* the combination of Sheesley and Mintz meet this limitation.

- f. filling the plurality of empty proppant containers with proppant thereby to produce a plurality of proppant filled containers*

Petitioner asserts that Sheesley discloses this limitation, citing in part Sheesley's disclosure that Figure 5 (reproduced *supra* Part II.D.1.a) "illustrates the loading of multiple modified cargo containers." Pet. 36–37 (citing in part Ex. 1005 ¶ 85).

Petitioner has shown that Sheesley discloses this limitation.

- g. the plurality of empty proppant containers being filled when positioned on the respective trailer of the respective proppant transporting road vehicles*

Petitioner asserts that Sheesley discloses this limitation through its disclosure of filling containers (positioned on a flatbed trailer of a truck), when the truck is near a rail site. Pet. 37.

Although Sheesley's Figure 5 (reproduced *supra* Part II.D.1.a) "illustrates the loading of multiple modified cargo containers . . . while sitting on [a] rail car" (Ex. 1005 ¶ 85 (emphasis added)), Sheesley also discloses that these containers can be loaded on a flatbed truck trailer (*id.* ¶ 78). Sheesley further discloses that "sand from the sand quarry . . . or source can . . . be loaded . . . to a modified cargo container" (*id.* (emphasis added)) and that the source "may be any point along a supply chain" (*see id.* at claim 21), which we determine includes a rail car loaded with proppant. *See also supra* Part II.D.1.a (addressing similar claim limitation).

Petitioner has shown that Sheesley discloses this limitation.

- h. transferring the plurality of proppant filled containers with one or more proppant transporting road vehicles to a drill site*

Petitioner asserts that Sheesley discloses this limitation, and cites to Sheesley's disclosure that the filled containers are moved "through all of the normal modes of transportation including . . . by truck, all the way to the frac site." Pet. 40 (citing Ex. 1005 ¶ 17).

Petitioner has shown that Sheesley discloses this limitation.

i. unloading each of the plurality of proppant filled containers with an unloader

Petitioner asserts that Sheesley discloses this limitation, citing to Sheesley's paragraph 83. Pet. 40. Sheesley's paragraph 83 discloses that "Rough Terrain Cargo Handler **298** can pick up one of the modified cargo containers **270** full of sand and unload the modified cargo container **270** to a bulk sand container **300** at the frac site." Ex. 1005 ¶ 83 (referencing Figure 4); *see also id.* at Fig. 3 (illustrating a wheeled loader).

Petitioner has shown that Sheesley discloses this limitation.

j. Summary

For the reasons given above, Petitioner has shown that independent claim 1 is unpatentable as obvious over Sheesley and Mintz.

2. Dependent Claim 2

Dependent claim 2 additionally recites the step of "vertically stacking the plurality of proppant filled containers." Ex. 1001, 11:9–14.

Petitioner asserts that Sheesley discloses this limitation, citing Sheesley's disclosure that "Fig. 3 is a pictorial illustration of the stackability

of modified cargo containers, with or without sand.” Pet. 42–43 (citing Ex. 1005 ¶ 21).

Petitioner has shown that dependent claim 2 is unpatentable as obvious over Sheesley and Mintz.

3. *Dependent Claim 3*

Dependent claim 3 additionally recites the step of “conveying, on a conveyor, the proppant from . . . transporting rail vehicles to a source from which to fill the . . . containers” and that “each proppant container . . . [is] structurally strengthened by a plurality of support braces positioned separate from a frame.” Ex. 1001, 11:15–22. Petitioner relies on Mintz for disclosing the “plurality of support braces” (Pet. 46) and cites to Mintz’s description of modifying standard ISO containers to “accommodate an internal structure adapted to support and strengthen the walls and floor of” the containers, such as by incorporating “[h]orizontal and angular peripheral bracing framework” (*id.* (citing Ex. 1006, 2:28–31, 2:55–60)). Petitioner reasons that a POSITA would have modified Sheesley to include Mintz’s support braces in order to improve the structural support of Sheesley’s container. *See id.* at 65–66.

Petitioner relies on Sheesley, however, for disclosing the step of “conveying, on a conveyor, the proppant from . . . transporting rail vehicles to a source from which to fill the . . . containers.” *Id.* at 44–45 (citations omitted). In support of this assertion, Petitioner cites to Sheesley’s Figures 2 and 5 and its paragraphs 78, 84. *Id.* Mr. Schaaf testifies that, based on these

figures and paragraphs, Sheesley discloses this limitation. Ex. 1002 ¶ 119; *see also id.* ¶¶ 116–118 (citing Ex. 1005, Figs. 2, 5, ¶¶ 78, 84).

Patent Owner disputes Petitioner’s assertion that Sheesley discloses this limitation. *See* PO Resp. 27–32 (citations omitted). In particular, Patent Owner argues that “none of Petitioner’s cited figures (2 or 5) [of Sheesley] or their associated disclosures . . . teach using a conveyor to convey proppant from a rail vehicle to an intermediate source ‘from which to fill the plurality of empty proppant containers.’” *Id.* at 32.

We agree with Patent Owner.

The claimed limitation requires, *inter alia*, a conveyor that conveys proppant from a rail vehicle to a source, and from that source, containers are filled with proppant. Ex. 1001, 11:16–18 (“conveying, on a conveyor, the proppant from one or more proppant transporting rail vehicles to a source from which to fill the plurality of empty proppant containers”). We do not agree with Petitioner’s assertion that Sheesley’s Figures 2, 5, along with its paragraphs 78 and 84, meet this limitation, despite Mr. Schaaf’s testimony otherwise (Ex. 1002 ¶ 119).

We first reproduce Sheesley's Figure 2, below:

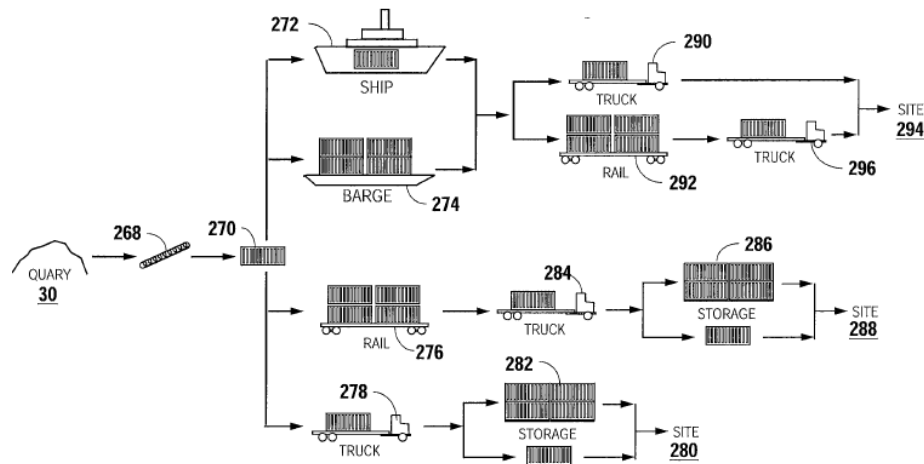


Fig. 2

Figure 2 “illustrates [Sheesley’s] invention being used to deliver sand from the quarry *or source* to the frac site.” Ex. 1005 ¶ 20 (emphasis added).

Sheesley also discloses that its “source” may be “any point along a supply chain of said proppant,” which we understand to include a rail vehicle. *Id.* at claim 21.

Turning to paragraph 78, Sheesley describes that “sand from the sand quarry **30** or source can now be loaded by a conveyor **268** to a modified cargo container which hereinafter will be referred to by reference numeral **270**.” *Id.* ¶ 78. Sheesley further describes, “Modified cargo containers **270** can be loaded on a ship **272**, barge **274**, rail **276** or a flatbed truck trailer **278**. Obviously, multiple modified cargo containers **270** may be loaded on each of these alternative modes of transportation.” *Id.*

Nothing in Figure 2 or paragraph 78 teaches or suggests proppant conveyed *from conveyor to a source for filling empty containers*, as required by the claim.

In addition to Figure 2, Petitioner relies on Sheesley's Figure 5. We reproduce Sheesley's Figure 5, below:

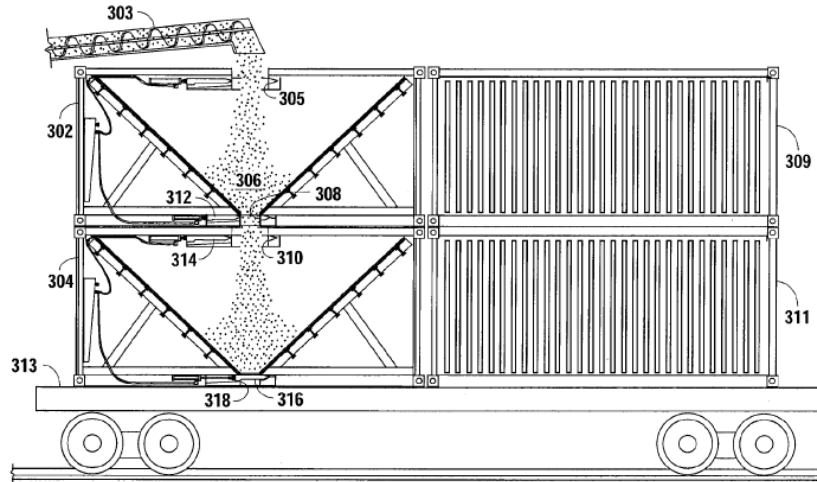


Fig. 5

Figure 5 “is an elevated sectional side view showing sand flowing through stacked modified cargo containers.” Ex. 1005 ¶ 23. In particular, Figure 5 depicts “modified cargo container 302 receives sand 306 from auger 303 through upper hatch 305. Modified cargo containers 306 may feed sand 306 or any other granular proppant therein through lower hatch 308 in modified cargo container 302 and upper hatch 310 into modified cargo container 304 located immediately there below.” *Id.* ¶ 84.

Although Figure 5 depicts auger 303 conveying sand to empty proppant containers 302, 304, it does not depict conveying sand to a separate source, which is later used for filling empty proppant containers, as required by the claim.

In its Reply, Petitioner asserts that the limitation does not require the claimed “source” to be an “‘intermediate source,’ *separate from the conveyor and empty containers.*” Pet. Reply 16 (citation omitted, emphasis

added). Petitioner contends that “this interpretation does not appear to be supported by the ’066 patent.” *Id.*

Petitioner’s position is that Sheesley’s auger 303 can satisfy *both* the claimed “conveyor” and “source” and Sheesley’s containers 302, 304 can satisfy *both* the claimed “empty proppant containers” and “source.” *See id.* (contending that the claimed source need not be an “intermediate source” separate from the conveyor and empty containers); *see also* PO Resp. 28 (“Petitioner asserts that two of these elements are met by the same structure in Sheesley. Sheesley does not actually disclose the claimed source . . . from which to fill empty proppant containers.”). Yet, the claim requires separate elements, specifically, a “conveyor,” a “source,” and a “plurality of empty proppant containers.” Ex. 1001, 11:16–18. As discussed above, claim 3 explicitly requires “conveying, on a conveyor, the proppant from . . . transporting rail vehicles to a source from which to fill the . . . containers.” The claim language requires a conveyor that is separate from the source, as the conveyor conveys proppant to a source. Petitioner’s reliance on Sheesley’s auger to satisfy both the “conveyor” and “source” is illogical, as is Petitioner’s reliance on Sheesley’s containers 302, 304 to satisfy both the “source” and “empty proppant containers.” *See Engel Indus., Inc. v. Lockformer Co.*, 96 F.3d 1398, 1404–05 (Fed. Cir. 1996) (concluding that where a claim provides for two separate elements, a “second portion” and a “return portion,” these two elements “logically cannot be one and the same”).

For the foregoing reasons, Petitioner failed to show that Sheesley discloses “conveying, on a conveyor, the proppant from . . . transporting rail

vehicles to a source from which to fill the . . . containers,” as required by dependent claim 3. As such, Petitioner has not shown that dependent claim 3 is unpatentable over Sheesley and Mintz.

4. *Dependent Claim 4*

Dependent claim 4 additionally recites the step of staging a plurality of road vehicles to receive one or more of the proppant-filled containers, moving each container from a vertically-stacked configuration, which is in close proximity to a rail spur, and loading the containers onto a bed of a trailer. *See* Ex. 1001, 11:23–12:8.

Petitioner reasons that it would have been obvious to stage multiple vehicles at the proppant’s source. Petitioner asserts that “Sheesley discloses loading the proppant into modified cargo containers at any point on the supply chain, including the rail spur . . . [and that the] cargo containers may be stacked.” Pet. 50 (citations omitted).

In addition to asserting that Sheesley discloses stacked containers, Petitioner also asserts that Mintz discloses that containers may be stacked adjacent a rail line. *Id.* at 52 (citations omitted). Petitioner cites to Mintz’s disclosure that its containers are “standard ISO shipping containers” that are fitted with “internal structure adapted to support and strengthen the walls and floor” for proppant material transfer. *Id.* at 54 (citing Ex. 1006, 1:65–2:02). Mr. Schaaf testifies that a “POSITA would understand that containers having proppant therein may be stacked at various points in the delivery process, including while the containers are adjacent a rail line.” Ex. 1002 ¶ 135.

Petitioner has shown that dependent claim 4 is unpatentable as obvious over Sheesley alone and Sheesley and Mintz.

5. *Dependent Claim 5*

Dependent claim 5 additionally recites the steps of “positioning a conveyor . . . [to] convey the proppant away from the . . . rail vehicle,” “positioning the plurality of . . . proppant containers to receive proppant sequentially,” and “transporting . . . [the] containers away from the rail spur.” Ex. 1001, 12:9–24.

To address claim 5, Petitioner relies on Sheesley for disclosing the steps of “positioning a conveyor” and “transporting . . . away from the rail spur,” as discussed similarly, above. Pet. 58–60, 61. Petitioner acknowledges, however, that “Sheesley does not expressly teach” the claimed “sequential filling of proppant containers.” *Id.* at 60. To address this missing limitation, Petitioner reasons that it would have been obvious to implement this “common filling practice” and relies on Mr. Schaaf’s declaration, who testifies that this was a very common practice in the fracking industry and that a POSITA would have understood to implement it. Ex. 1002 ¶ 150.

Petitioner has shown that dependent claim 5 is unpatentable as obvious over Sheesley and Mintz.

6. *Dependent Claim 6*

Dependent claim 6 additionally recites the step of “loading each of the . . . containers onto a platform,” “providing a conveyor adjacent the

platform,” and “discharging the proppant from each of the . . . containers onto the conveyor.” Ex. 1001, 12:25–31.

Petitioner asserts that Sheesley discloses these limitations, citing Sheesley’s Figure 7, a copy of which we reproduce, below:

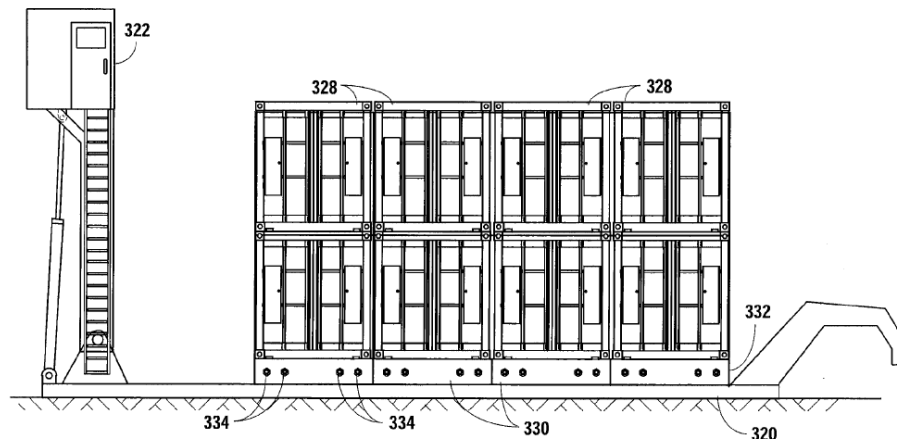


Fig. 7

According to Petitioner, Figure 7 depicts proppant-filled containers 328 stacked onto system 330, which includes a belt (the claimed “conveyor”) to transport proppant released from a hatch located at the bottom of the containers. Pet. 62 (citing Ex. 1005 ¶¶ 84, 88, 89). Mr. Schaaf testifies that a POSITA would have understood that belt system 330 includes a platform “for supporting the container so that the conveyor could move without contacting the containers positioned on the support structure.” Ex. 1002 ¶ 154.

Petitioner has shown that dependent claim 6 is unpatentable as obvious over Sheesley and Mintz.

7. Summary

For the reasons discussed above, Petitioner has shown that claims 1, 2, and 4–6 are unpatentable as obvious over Sheesley and Mintz. Petitioner has not shown that dependent claim 3 is unpatentable.

E. Ground 2: Claims 1, 2, and 4–6 as obvious over Sheesley

Ground 2 is similar to Ground 1 with the exception that Petitioner does not rely on Mintz in Ground 2. As discussed above (*supra* Part II.D.1–7), Petitioner has shown that claims 1, 2, and 4–6 are unpatentable over Sheesley alone. *See supra* Part II.D.1, 2, 4–6.

For the reasons discussed above in connection with Ground 1, Petitioner has shown that claims 1, 2, and 4–6 are unpatentable over Sheesley.

F. Ground 3: Claim 3 as obvious over Sheesley, Mintz, and Hedrick

As discussed above, dependent claim 3 recites, *inter alia*, “conveying, on a conveyor, the proppant from . . . transporting rail vehicles to a source from which to fill the . . . containers” and that “each proppant container . . . [is] structurally strengthened by a plurality of support braces positioned separate from a frame.” Ex. 1011, 11:15–22.

As distinguished from Ground 1, Petitioner relies on Hedrick for addressing the claimed “container . . . structurally strengthened by a plurality of support braces.” Pet. 67–68 (citations omitted). Petitioner does not rely on Hedrick for satisfying the claimed “conveying, on a conveyor, the proppant from . . . transporting rail vehicles to a source from which to fill the . . . containers.” *See id.* at 67. Rather, Petitioner maintains that “Sheesley discloses this limitation.” *Id.* (citation omitted).

Because we find that Sheesley does not disclose this limitation (*supra* Part II.D.3), Petitioner has failed to show that dependent claim 3 is unpatentable over Sheesley, Mintz, and Hedrick.

III. 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, 2, and 4–6 of the '066 patent are unpatentable. Petitioner has not shown that claim 3 is not unpatentable.³

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–6	103(a)	Sheesley, Mintz	1, 2, 4–6	3
1, 2, 4–6	103(a)	Sheesley	1, 2, 4–6	
3	103(a)	Sheesley, Mintz, Hedrick		3
Overall Outcome			1, 2, 4–6	3

³ 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).

IV. ORDER

Accordingly, it is:

ORDERED that claims 1, 2, and 4–6 of the '066 patent have 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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