Arrows Up, LLC

V.

Oren Technologies, LLC

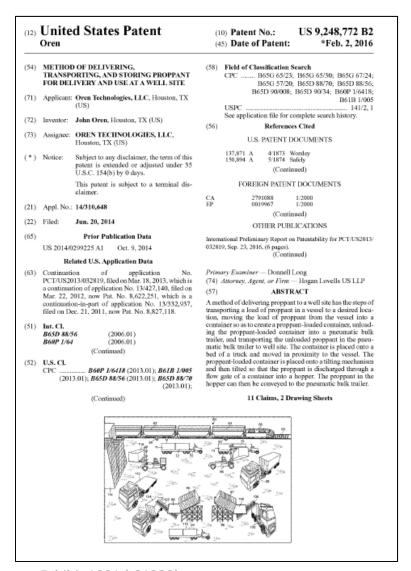
Petitioner Arrows Up LLC's Demonstrative Slides IPR2018-01230 / U.S. Patent No. 9,248,772 IPR2018-01231 / U.S. Patent No. 9,617,066

United States Patent and Trademark Office

October 17, 2019 Oral Argument

1:00 pm Eastern / Madison Building East

Background: Patents



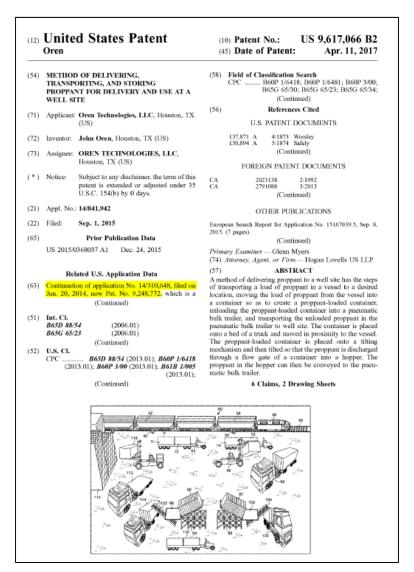
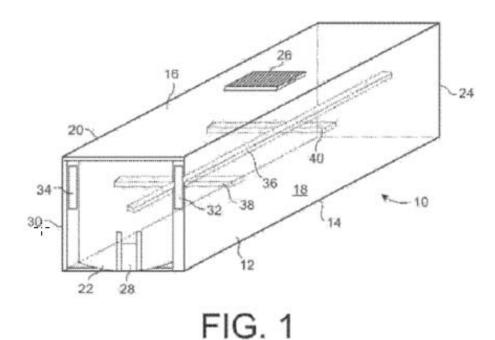


Exhibit 1001 (-01230)

Exhibit 1001 (-01231)

Background: Patents



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

Paper 7 (-01231 Inst. Dec.) at 5

Background: Patents

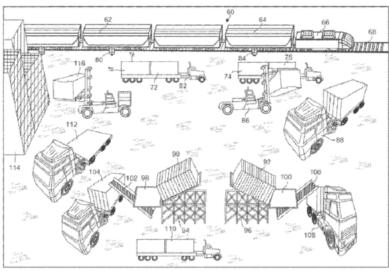


FIG. 3

According to the '066 patent, Figure 3 illustrates system 60 "of the present invention." Ex. 1001, 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, and 76, which may be supported on a bed of a truck. *Id.* at 8:26–36. Loader/unloader 86 moves containers 70, 72, 74, and 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.

Paper 7 (-01231 Inst. Dec.) at 4

Background: Challenged Claims/Grounds

-01230 Proceeding (772 Patent)

Ground	Prior Art	Claim(s)
1	Sheesley	1, 2, 6-10
2	Sheesley and Mintz	1
3	Sheesley, Mintz, and Uhryn	3-5, 11

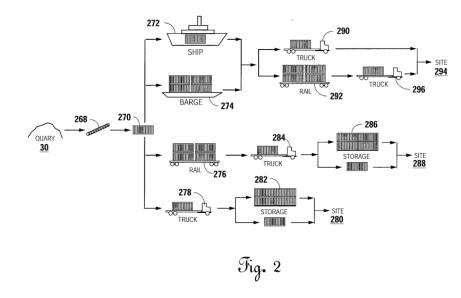
Paper 7 (-01230 Inst. Dec.) at 7

-01231 Proceeding (066 Patent)

Ground	Prior Art	Claim(s)
1	Sheesley and Mintz	1-6
2	Sheesley	1, 2, and 4-6
3	Sheesley, Mintz, and Hedrick	3

Paper 7 (-01231 Inst. Dec.) at 6

Background: Sheesley



[0078] Turning to FIG. 2, sand from the sand quarry 30 or source can now be loaded by a conveyer 268 to a modified cargo container which hereinafter will be referred to by reference numeral 270. 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.

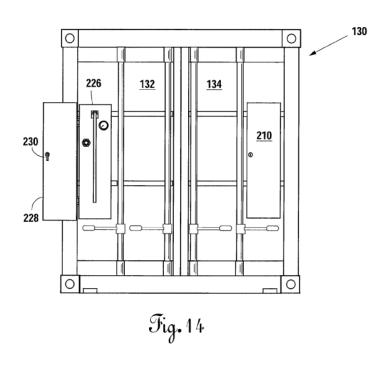
[0079] If the modified cargo containers 270 are loaded on flatbed truck trailer 278 or container chassis, the modified cargo containers 270 can be taken directly to the fracing site 280 or placed in storage 282 at the fracing site 280.

[0080] Concerning sand being hauled by rail 276, the modified cargo containers 270 will have to be off-loaded onto flatbed truck trailer 284, which flatbed truck trailer 284 can then take the modified cargo containers 270 filled with fracing sand either to storage 286 or to the fracing site 288.

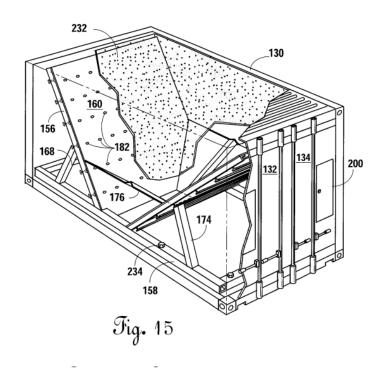
[0081] Concerning the modified cargo containers 270 being hauled by ship 272 or barge 274, the modified cargo containers 270 will have to be off-loaded onto either a flatbed truck trailer 290 or a rail car 292. If being hauled by the flatbed truck trailer 290, the modified cargo container 270 can be taken directly to the fracing site 294. However, if modified cargo containers 270 are being transported by rail car 292, they must be off-loaded onto flatbed truck trailer 296 prior to be taken to the fracing site 294.

Ex. 1003 (-01230) Ex. 1005 (-01231)

Background: Sheesley



[0032] FIG. 14 is an end view of a modified cargo container illustrating the control panels.



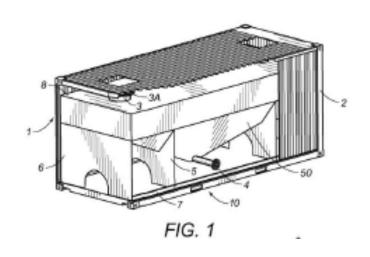
[0033] FIG. 15 is a partial sectional view of a modified cargo container.

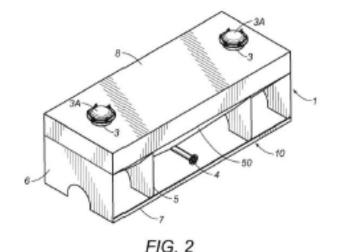
Ex. 1003 (-01230) Ex. 1005 (-01231)

Background: Mintz

• "describes 'internal structure adapted to support and strengthen walls and floor of' standard ISO shipping containers. Ex. 1006, [54], 1:65–67. In particular, Mintz discloses, '[h]orizontal and peripheral angular bracing framework to strengthen the side walls of such standard ISO intermodal shipping container.' *Id.* at 2:55–57."

Paper 7 (-01230 Inst. Dec.) at p. 15



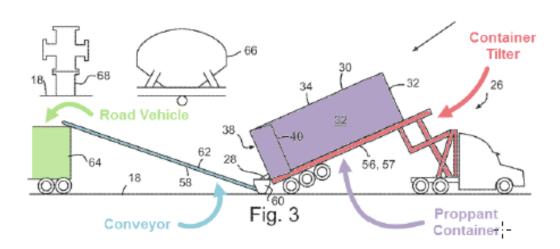


Ex. 1004 (-01230) Ex. 1006 (-01231)

Background: Uhryn

• "Uhryn discloses an intermodal transport container with one or more gates used for unloading proppant. *Id.* ¶ 4. 'Unloading may be carried out using a container tilter 56, such as a hydraulic fifth wheel tilter Tilter 56 may be mounted on a wheeled trailer' *Id.* ¶ 20. Tilter 56 is shown in Uhryn's Figure 3, which is reproduced below."

Paper 7 (-01230 Inst. Dec.) at p. 16

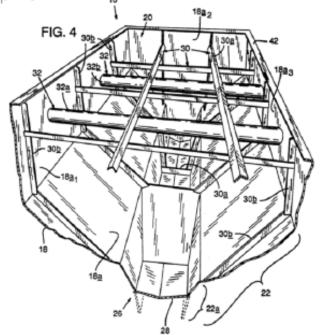


Ex. 1002 (Schaaf Decl.) at p. 32

Background: Hedrick

• "Figure 4 depicts hopper 10 that defines bulk-material storage space 20. Ex. 1007, 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 5:3–11."

Paper 7 (-01230 Inst. Dec.) at p. 16



Limitations at Issue

Limitation	Relevant Claim(s)
"Second different end surface"	066 Patent – All Challenged Claims 772 Patent – All Challenged Claims
"Positioning" Limitation	066 Patent – Independent Claim 1
"Vertically Stacking" Limitations	772 Patent – Independent Claim 1 772 Patent – Dependent Claim 2
"Conveying Proppant" to source	066 Patent – Dependent Claim 3
"Conveying Proppant" to road vehicle	772 Patent – Dependent Claim 4

Paper No. 8 (-01231 Scheduling Order) at 5; Paper No. 8 (-01230 Scheduling Order) at 5.

[&]quot;Patent Owner is cautioned that any arguments for patentability not raised in a response may be deemed waived."

772 Patent: Independent Claim 1

- 1. A method of transporting proppant, the method comprising:
 - a) vertically stacking a plurality of empty proppant containers in close proximity to a rail spur so that one of the plurality of empty proppant containers overlies another one of the plurality of empty containers thereby to reduce footprint of the area required adjacent the rail spur to store the plurality of empty proppant containers, 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 so that a large amount of weight can be stacked upon the container and so that heavy weight can be stored therein;
 - b) filling the plurality of empty proppant containers with proppant from one or more proppant transporting rail vehicles thereby to produce a plurality of proppant filled containers;
 - c) transferring the plurality of proppant filled containers with a loader onto one or more support platforms associated with one or more proppant transporting road vehicles.

066 Patent: Independent Claim 1

The invention claimed is:

- 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.

066 Patent – All Challenged Claims

772 Patent – All Challenged Claims

Claim Construction

- <u>Construction</u>: Two end surfaces are structurally different not mere duplication Paper 7 (-01230 Inst. Dec.) at p. 9; Paper 7 (-01231 Inst. Dec.) at p. 9
- Support: In the apparatus of the present invention, at least one of the end walls is recessed inwardly of the end of the pair of side walls and inwardly at the bottom wall and inwardly at the top wall. This end wall has a generally convex shape."

Ex. 1001, (066 Patent) 5:21-24, Fig. 1

"[o]nly end wall 22 includes a flow gate 28, an inlet 32, and a vent 34."

Paper 6 (-01231 POR) at p. 12

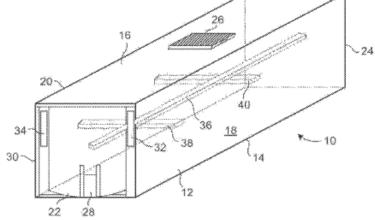


FIG. 1

"A general purpose cargo container has doors fitted *at one end* and is constructed of corrugated weathering steel."

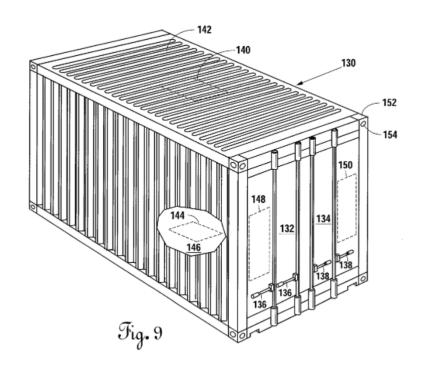
Ex. 1005 (-01231 Sheesley) [0006] (emphasis added)

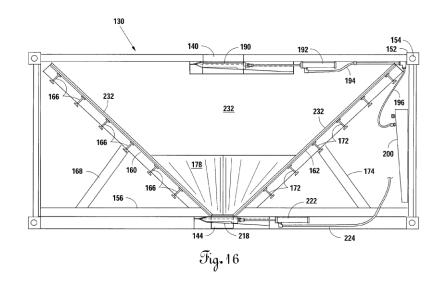
"cargo container 130 is made out of corrugated metal and has doors 132 and 134, on the one end thereof"

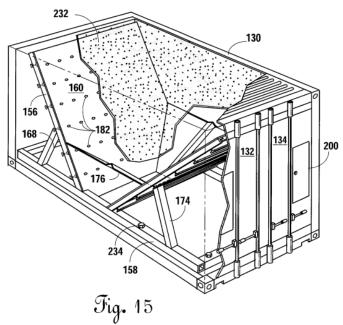
Ex. 1005 (-01231 Sheesley) [0050] (emphasis added)

"Control panel openings 148 and 150 are cut in doors 132 and 134, respectively."

Ex. 1005 (-01231 Sheesley) [0050]







Deposition Testimony of Patent Owner's Expert – Fred Smith

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Q. Do they describe control panels on the other end anywhere in the patent?

A. No.

Do they describe doors anywhere on the other end anywhere in the patent?

A. Not that I am aware of, no.
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Ex. 1016 (-01230/-01231 Smith Dep.) at 23:20-25

Sheesley discloses "Positioning" Limitation

066 Patent – All Challenged Claims

"Positioning" Limitation

- 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

Requirements:

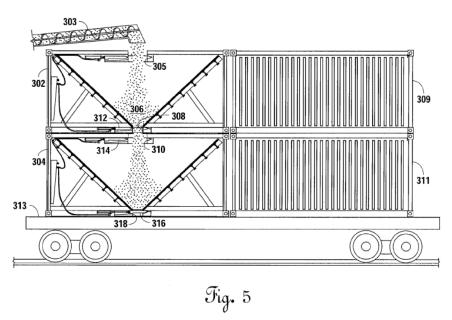
What: Positioning plurality of empty containers

Where: On a trailer of a road vehicle (e.g. truck)

Sheesley discloses empty container on truck

"For example, in FIG. 5, modified cargo container 302 receives sand 306 from auger 303 through upper hatch 305."

Ex. 1005 (-01231 Sheesley) [0084]



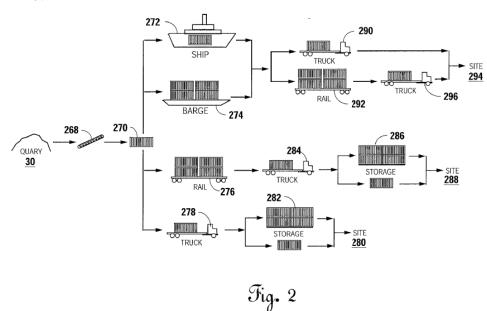
"Modified cargo containers 270 can be loaded on a ship 272, barge 274, rail 276 or a flatbed truck trailer 278."

Ex. 1005 (-01231 Sheesley) [0078]

Sheesley discloses empty containers on trucks

"[S]and from the sand quarry 30 or source can now be loaded by a conveyer 268 to a modified cargo container . . . Modified cargo containers 270 can be loaded on a ship 272, barge 274, rail 276 or a flatbed truck trailer 278."

Ex. 1005 (-01231 Sheesley) [0078]



"21. The method for delivering proppant to the site of a well being fraced as recited in claim 19 wherein said source may be any point along a supply chain of said proppant."

Ex. 1005 (-01231 Sheesley) Claim 21

Sheesley discloses "Vertically Stacking" Limitations

772 Patent – Independent Claim 1

772 Patent – Dependent Claim 2

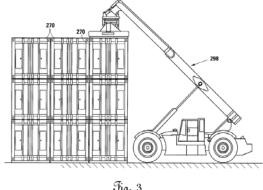
772 Patent: Independent Claim 1

- 1. A method of transporting proppant, the method comprising:
- a) vertically stacking a plurality of empty proppant containers in close proximity to a rail spur so that one of the plurality of empty proppant containers overlies another one of the plurality of empty containers thereby to reduce footprint of the area required adjacent the rail spur to store the plurality of empty proppant containers, each of the plurality of empty proppant containers, 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 so that a large amount of weight can be stacked upon the container and so that heavy weight can be stored therein;
- 2. The method of claim 1, wherein the plurality of proppant filled containers comprises a first plurality of proppant filled containers, and the method further comprising:
 - filling a second plurality of empty proppant containers with proppant from one or more proppant transporting rail vehicles thereby to produce a second plurality of proppant filled containers: and
 - vertically stacking the second plurality of proppant <u>filled</u> containers with a loader so that one of the plurality of proppant filled containers overlies another one of the plurality of filled containers to reduce the footprint of the area required for storage of the proppant in close proximity to the rail spur.

Sheesley teaches "vertically stacking" limitations

 "FIG. 3 is a pictorial illustration of the stackability of modified cargo containers, with or without sand therein."

Ex. 1003 (-01230 Sheesley) [0021]



 "Also, the modified frac containers may be stacked in any conventional means, either while in transit or at the frac site."

Ex. 1003 (-01230 Sheesley) [0018]

 "[S]and from the sand quarry 30 or source can now be loaded by a conveyer 268 to a modified cargo container . . . Modified cargo containers 270 can be loaded on a ship 272, barge 274, rail 276 or a flatbed truck trailer 278."

Ex. 1003 (-01230 Sheesley) [0078]

Sheesley alone or Sheesley/Uhryn teach "Conveying" proppant to road vehicle

772 Patent – Dependent Claim 4

772 Patent: Dependent Claim 4

- **4**. The method of claim **1**, further comprising:
- conveying the proppant from the one or more proppant transporting rail vehicles to the plurality of empty proppant containers on a first conveyor; and
- conveying the proppant from one or more of the plurality of proppant tilled containers to one or more proppant transporting road vehicles on a second conveyor.

• The parties agree that "tilled" should be read as "filled" Paper 14 (-01230 PO Response) at 32; Paper 21 (-01230 Pet. Reply) at 20

Sheesley teaches "conveying" limitation

121. Sheesley discloses that proppant may be unloaded from the filled containers by opening the lower hatch, unloading proppant onto a second conveyor which conveys proppant into the blender. Ex. 1003 (Sheesley) ¶[0084] ("For example, in FIG. 5 . . . [t]he sand 306 may either be transferred from the modified cargo container 302 into the modified cargo container 304 located immediately there below or delivered to a conveyer (not shown) located below the lower modified cargo container 304 by opening its lower sliding door 316 to open lower hatch 318. The sand flowing from the lower hatch 318 may be dumped on a belt (not shown), which will feed the sand to the blenders (not shown).") (emphasis added); ¶[0089] ("In FIG. 7, only the outside view of the belt system 330 is shown. However, fracing sand will be delivered through the dispensing end 332 of the belt system 330 to deliver the fracing sand to the blender."); Fig. 5; Fig. 7. In my opinion, a POSITA would understand that proppant could just as easily be unloaded from the filled containers by opening the lower hatch, unloading proppant onto a second conveyor which conveys proppant into proppant transporting road vehicles, particularly where Sheesley discloses the use of a conveyor to unload containers, and that containers may be emptied into bulk proppant containers such as the Sand King. Ex. 1003 (Sheesley) ¶[0083]; ¶[0089].

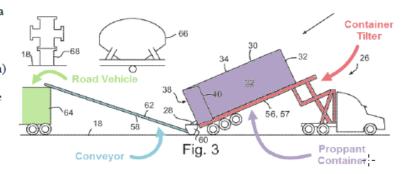
Exhibit 1002 (-01230 Schaaf Decl.) at ¶ 121

Sheesley/Uhryn teaches "conveying" limitation

alone, it is my opinion that it is rendered obvious by Sheesley in view of Uhryn.

Uhryn discloses unloading proppant "from intermodal transport container 30 into a proppant transfer device 58 positioned to receive . . . proppant unloaded from the one or more rear gates 40 of the intermodal transport container." Ex. 1005 (Uhryn) at ¶ [0020]. Uhryn further states that "[p]roppant transfer device 58 may comprise one or more of a hopper 60 and a *conveyor* 62." Ex. 1005 (Uhryn) at ¶ [0020]. Uhryn also explains that "[a] mountain mover 64, also called a sand king, may be connected to receive proppant from the proppant transfer device 58" Ex. 1005 (Uhryn) at ¶ [0020]. In my opinion, a POSITA would understand that the "mountain mover" referenced in Uhryn is a road vehicle capable of transporting proppant filled container into a road vehicle via a conveyor:

Exhibit 1002 (-01230 Schaaf Decl.) at ¶ 123



Ex. 1002 (-01230 Schaaf Decl.) at p. 32

Sheesley/Uhryn teaches "conveying" limitation

Deposition Testimony of Patent Owner's Expert – Fred Smith

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Q. Are you familiar with over-the-road frac sanders?

A. You would have to point me to what you are actually talking about. I mean, they are in the same category as the Sand Kings and Mountain Movers and Frac Sanders, they are essentially the same type of unit, and they do go over-the-road.
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Ex. 1016 (-01230 Smith Dep.) at 50:8-14

Sheesley discloses "Conveying" proppant to a source

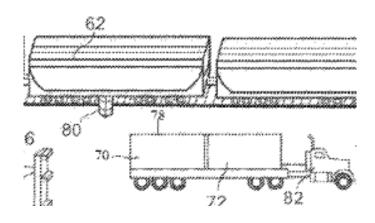
066 Patent – Dependent Claim 3

066 Patent: Dependent Claim 3

3. The method of claim 1, further comprising:

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, each proppant container of the plurality of empty proppant containers being structurally strengthened by a plurality of support braces positioned separate from a frame of the respective proppant container.

066 Patent: Disclosure



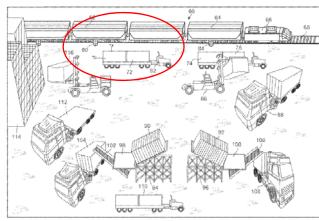


FIG. 3

In other words, the hopper of the bulk material train 64 is opened adjacent to the conveyer 80. The conveyer 80 extends between the gate of the vessel 62 and the hatch at the top wall 78 of the container 70. Once this hopper of the bulk material train 64 is unloaded into the vessel 70, the conveyer 80 can be moved forwardly along the bulk material train 64 so that another hopper can discharge its proppant content into the container 72 of truck 82.

Exhibit 1001 (066 Patent) at 8:28-35

Sheesley teaches "conveying" limitation

118. Sheesley further discloses that the proppant from the source (which,

as explained above regarding limitation 1(a)(iii), can include a rail vehicle) passes to a source, namely an auger 302, before filling the empty modified cargo container. See Ex. 1005 (Sheesley) ¶[0084] ("For example, in Fig. 5, 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. This was accomplished by opening the lower sliding door 312 in modified cargo container 302 and the upper sliding door 314 in modified cargo container 304."); Fig. 5

Ex. 1002 (-01231 Schaaf Decl.) ¶ 118

Sheesley teaches "conveying" limitation

"rail car 42 may be unloaded by conveyor 56 into storage 58 or truck 60. . . If the sand goes through storage 58, it will later have to be loaded by conveyor 59 onto trucks 64 and then unloaded at the frac site by conveyor 66"

Ex. 1005 (-01231 Sheesley) [0044]

"A reference must be considered for everything that it teaches, not simply the described invention or preferred embodiment"

In re Applied Materials, Inc., 692 F.3d 1289, 1298 (Fed. Cir. 2012)