

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SOLARIS OILFIELD SITE SERVICES OPERATING, LLC, AND
SOLARIS OILFIELD SITE SERVICES PERSONNEL, LLC,
Petitioners

v.

MASABA, INC.,
Patent Owner

Case No. IPR2024-01179
Patent No. 11,780,689

**DECLARATION OF DAVID SMITH IN SUPPORT OF PETITION FOR
INTER PARTES REVIEW**

I, David Smith, hereby declare as follows:

I. INTRODUCTION

1. My name is David Smith. I make this declaration based upon my own personal knowledge and, if called upon to testify, would testify competently to the matters contained herein.

2. I have been asked to provide technical assistance in the *inter partes* review (“IPR”) of U.S. Patent No. 11,780,689 (which I may abbreviate as “the ’689 Patent”). In this declaration I may refer to this IPR by its patent number or IPR number (*e.g.*, “’689 IPR” or “IPR2024-01179”). This declaration is a statement of my opinions on issues related to the unpatentability of claims of the ’689 Patent. I am being compensated at my normal hourly rate for my analysis, plus reimbursement for expenses. My compensation does not depend on the content of my opinions or the outcome of this proceeding.

II. EXPERIENCE AND QUALIFICATIONS

3. In formulating my opinions, I have relied upon my knowledge, training, and experience in the relevant art. My qualifications are stated more fully in my curriculum vitae, which has been provided as Appendix A. My CV also lists publications on which I am a named author and identifies parties on behalf of whom

I have previously provided expert testimony within the past four years. Here, I provide a brief summary of my qualifications.

4. I received a Bachelor's degree in Mechanical Engineering from Brigham Young University - Idaho. I received a Master's of Science degree in Mechanical Engineering from Brigham Young University (BYU), and a Masters of Business Administration from Brigham Young University (BYU) with an emphasis in Product Development. I am a licensed professional engineer (PE) and a certified safety professional in comprehensive practice (CSP).

5. I have experience in the fields of mechanical engineering, structural design, new product development, the design of hydraulic equipment, tools, machinery and safety. In my role as a consultant, I have consulted on numerous conveyors and other material handling equipment. Examples of conveyors I have worked on include mobile conveyors and stationary conveyors. These have included belt conveyors for conveying rock, sand, gravel, mulch, concrete and asphalt; roller conveyors for conveying boxed goods, auger conveyors for conveying concrete, grain, ice, and potatoes, and pneumatic trailers/pneumatic conveyors for conveying sand, fly ash, cement powder and plastic pellets. I have at least 3 years of experience of full-time engineering work on conveyors. Other types of material handling equipment I have worked on include proppant storage containers, forklifts, custom forklift attachments, man lifts, telehandlers, cranes, custom lifting devices, and many

types of trailers and tarping systems. I have at least another 5 years of experience of full-time engineering work on other material handling equipment. I am a named inventor on seven U.S. Patents including US Patent 10,683,176 titled Material Placer, which has multiple conveyor segments, and Patents US 9,789,916, US 9,758,083 and US 9,616,799 for Pneumatic Tank Trailers (pneumatic conveyors), which can be unloaded into a silo with a stream of air.

6. Both now and as of the '689 Patent's filing date, I have had at least 2 years of experience in engineering the mechanical aspects of aggregate transferring equipment. That experience is based on the work on the systems described above.

7. I am an expert in the fields of mechanical design, design of hydraulic equipment, machine safety, and forklift operation. I have more than 15 years of experience in these areas.

8. Therefore, based on my education, professional experience of over 15 years, and publications, I am an expert in the relevant field of the Challenged Patent at issue here and have been an expert in this field since before the Challenged Patent was filed with the United States Patent and Trademark Office ("USPTO"). I am familiar with how a person having ordinary skill in the art would have understood and used the terminology found in the '689 Patent at the time of its filing.

III. MATERIALS REVIEWED AND LIST OF EXHIBITS

9. I have been asked to review the Challenged Patent and its prosecution history, to provide an understanding of the technology relevant to the Challenged Patent, to review certain prior-art references, and to analyze whether or not those references disclose or teach limitations of claims from the Challenged Patent. The opinions stated in this declaration are from the perspective of a person of ordinary skill in the art (POSITA).

10. In forming my opinions, I have reviewed the '689 Patent, its prosecution history and references cited by the Examiner, the materials cited in the List of Exhibits below, and the materials cited throughout my declaration. I have also reviewed the Patent Owner's Response ("POR") filed in this IPR, including the exhibits submitted therewith that relate to the opinions below. I have also reviewed the declaration of Mr. Travis Anderson, including the exhibits thereto that relate to the opinions below.

11. All citations to exhibits reference original page numbers found in the underlying document, and all emphases are added unless otherwise noted.

Ex.	Description
EX1001	U.S. Patent No. 11,780,689 to Brenden et al. ("the '689 Patent")
EX1003	Expert Declaration of Petitioner's Expert, Durham
EX1004	U.S. Patent No. 9,663,303 to Waldner et al. ("Waldner")

EX1005	<u>Belt Conveyor-based Loading Systems</u> , https://web.archive.org/web/20160819111857/http://mcschroeder.com/wp-content/uploads/2012/09/Product-Spec-Sheet-Belt-EconoLoader.pdf (August. 19, 2016) (“ <i>Dynatek</i> ”)
EX1006	U.S. Patent No. 11,691,831 to Sleeman et al. (“ <i>Sleeman</i> ”)
EX1112	Declaration of Jeremy Weinstein
EX1113	Transcript of Deposition of Travis A. Anderson
EX1043	Proposed Specifications with Cost from Anchor (from the June 18, 2025 Deposition of Mr. Dan Brinkman)
EX1124	Email with Schematics of the Solaris Six-Pack
EX1130	“Liebherr MK 88 Plus Mobile Tower Crane Erects Asphalt Recycling Plant In The Netherlands”, available at: https://www.cranetrader.com/blog/crane-and-lifting-equipment-news/2020/12/liebherr-mk-88-plus-mobile-tower-crane-erects-asphalt-recycling-plant-in-the-netherlands
EX1131	Dictionary of Mechanical Engineering, G. H. F. Nayler, 1999, ISBN 10:81-7224-789-3
EX1132	Illustrated Dictionary of Mechanical Engineering, Griffith Pearson, 2015, ISBN 81-89093-48-7
EX1133	U.S. Patent No. 2,980,222 to Peter Crosby
EX1134	“Power Conveyor or Gravity Conveyor?”, available at: https://www.ashlandconveyor.com/pages/power-vs-gravity?srsId=AfmBOopTf-E4GchqwUxOzcnOhANImtl9vtukvFiPL4D_NGfKaVLgXJU
EX1135	“Belt Installation, Tracking, and Maintenance Guide”, LEWCO, Inc., 2018.
EX1136	U.S. Patent No. 3,545,599 to Smith et al.

EX1137	“Automatic Vehicle Leveling System”, available at: https://www.gesmuhendislik.com/works/automatic-vehicle-leveling-system/
EX1138	“CST Storage Frac Sand Storage Solutions”, available at: https://www.cstindustries.com/wp-content/uploads/2019/01/Frac-Sand-Storage-Solutions-Brochure_web-version.pdf
EX1139	U.S. Patent No. 4,789,056 to Robert Bourbeau
EX1140	“Don’t Be Thrown a Curve: Understanding Belted Conveyor vs. Live Roller Conveyor in Curve Applications”, available at: https://blog.hytrol.com/dont-be-thrown-a-curve-understanding-belted-conveyor-vs-live-roller-conveyor-in-curve-applications/
EX1141	“How America's 'most reckless' billionaire created the fracking boom”, available at: https://www.theguardian.com/news/2018/aug/30/how-the-us-fracking-boom-almost-fell-apart
EX1142	“Gooseneck vs 5th Wheel”, available at: https://web.archive.org/web/20201203233432/https://www.curtmfg.com/5th-wheel/gooseneck-adapters/learn-more
EX1143	“HOLLAND FW35”, available at: https://safholland.com/us/en/products/holland-fw35-sd?tx_productcataloguesaf_productcatalogue%5BpreviousCategory%5D=35&cHash=04537b6b9686f2eb6129cdc9c895b3c7
EX1144	U.S. Patent No. 4,135,614 to Penterman et al.
EX1145	U.S. Patent No. 10,414,599 to McCloskey et al.
EX1146	U.S. Patent No. 10,556,752 to McCloskey et al.
EX1147	U.S. Patent No. 8,684,161 to Gausman et al.
EX1148	U.S. Patent Publication No. 2007/0029170 to Daniel Anagnost
EX1149	U.S. Patent No. 9,616,799 to David Smith

EX1150	Engineering Manual – Innovative Belt & Chain Solutions for Every Industry & Application
EX1151	“A Review on the Angle of Repose of Granular Material”, by Al-Hashemi et al., <i>Powder Technology</i> , pgs. 397-417, 27 Feb. 2018.
EX1153	“Frac Sand Storage and Handling System”, available at: https://www.tankconnection.com/assets/pdf/frac-sand-system.pdf
EX2004	Expert Declaration of Travis A. Anderson
EX2008	Solaris Oilfield Infrastructure Investor Presentation September 2021

IV. LEGAL STANDARDS

A. Level of Ordinary Skill in the Art

12. When interpreting a patent, I understand that it is important to identify the relevant art pertaining to the patent-in-suit as well as the level of ordinary skill in that art at the time of the claimed invention. The “art” is the field of technology to which the patent is related.

13. I have been instructed by counsel that the person of ordinary skill in the art is a hypothetical person who is presumed to know the relevant prior art. I understand that the actual inventor’s skill is not determinative of the level of ordinary skill. I further understand that the factors that may be considered in determining the level of skill include: the types of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field. I understand that

not all such factors may be present in every case, and one or more of them may predominate.

B. Legal Standard for Claim Construction

14. I understand that the first step in determining whether a patent claim would have been anticipated or obvious is to ascertain how a POSITA would have understood the claim terms.

15. I have been instructed by counsel on the law regarding claim construction and patent claims, and I understand that a patent may include two types of claims: independent claims and dependent claims. An independent claim stands alone and includes only the limitations it recites. A dependent claim can depend from an independent claim, or it can further depend from another dependent claim. I understand that a dependent claim includes all the limitations that it recites, in addition to all the limitations recited in the claim(s) from which it depends.

16. It is my understanding that in proceedings before the USPTO, the claims of a patent are to be construed under what is referred to as the “Phillips standard.” I understand that this means that claim terms of a patent are given the meaning the terms would have to a POSITA, in view of the description provided in the patent itself and the patent’s file history.

17. I understand that to determine how a person of ordinary skill would understand a claim term, one should look to those sources available that show what

a person of skill in the art would have understood the disputed claim language to mean. I understand that, in construing a claim term, one looks primarily to the intrinsic patent evidence, including the words of the claims themselves, the remainder of the patent, and the patent's prosecution history. I understand that extrinsic evidence, which is evidence external to the patent and the prosecution history, may also be useful in interpreting patent claims when the intrinsic evidence itself is insufficient.

18. I understand that words or terms should be given their ordinary and accepted meaning unless it appears that the inventors were using them to mean something else. In making this determination, the claims, the remainder of the patent, and the prosecution history are of paramount importance. Additionally, the patent and its prosecution history must be consulted to confirm whether the patentee has acted as its own lexicographer (i.e., provided its own special meaning to any disputed terms), or intentionally disclaimed, disavowed, or surrendered any claim scope.

19. In comparing the claims of the Challenged Patent to the prior art, I have considered the Challenged Patent and its file history in light of the understanding of a person of skill at the time of the alleged invention.

C. Obviousness

20. I understand that the prior art may render a patent claim “obvious.” I understand that two or more prior art references (e.g., prior art articles, patents, or publications) that each disclose fewer than all elements of a patent claim may nevertheless be combined to render a patent claim obvious if the combination of the prior art collectively discloses all elements of the claim and one of ordinary skill in the art at the time would have been motivated to combine the prior art in such a way. I understand that this motivation to combine need not be explicit in any of the prior art but may be inferred from the knowledge of one of ordinary skill in the art at the time the patent was filed. I also understand that one of ordinary skill in the art is not an automaton but is a person having ordinary creativity. I further understand that one or more prior art references, articles, patents or publications that disclose fewer than all of the elements of a patent claim may render a patent claim obvious if including the missing element would have been obvious to one of skill in the art (e.g., the missing element represents only an insubstantial difference over the prior art or a reconfiguration of a known system).

21. I understand that under the doctrine of obviousness, a claim may be invalid if the differences between the invention 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 POSITA to which the subject matter pertains.

22. To assess obviousness, I understand that I am to consider the scope and content of the prior art, the differences between the prior art and the claim, the level of ordinary skill in the art, and any secondary considerations to the extent they exist.

23. I understand that any evidence of secondary indicia of non-obviousness should be considered when evaluating whether a claimed invention would have been obvious to one of ordinary skill at the time of invention. These secondary indicia of non-obviousness may include, for example:

- a long felt but unmet need in the prior art that was satisfied by the claimed invention;
- commercial success of processes claimed by the patent;
- unexpected results achieved by the invention;
- praise of the invention by others skilled in the art;
- the taking of licenses under the patent by others; and
- deliberate copying of the invention.

24. I understand that there must be a nexus between any such secondary indicia and the claimed invention.

25. It is also my understanding that there are additional considerations that may be used as further guidance as to when the above factors will result in a finding that a claim is obvious, including the following:

- the claimed subject matter is simply a combination of prior art elements according to known methods to yield predictable results;

- the claimed subject matter is a simple substitution of one known element for another to obtain predictable results;
- the claimed subject matter uses known techniques to improve similar devices or methods in the same way;
- the claimed subject matter applies a known technique to a known device or method that is ready for improvement to yield predictable results;
- the claimed subject matter would have been “obvious to try” choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- there is known work in one field of endeavor that may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to a POSITA;
- there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent’s claims; and
- there is some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed subject matter.

26. Finally, I understand that a claim may be deemed invalid for obviousness in light of a single prior art reference, without the need to combine references, if the elements of the claim that are not found in the reference can be supplied by the knowledge or common sense of one of ordinary skill in the relevant art.

V. LEVEL OF SKILL OF A PERSON HAVING ORDINARY SKILL IN THE ART

27. I understand that Petitioners have asserted that a POSITA for the ‘689 Patent would have a degree in mechanical, electrical, petroleum, or civil engineering

and with at least two years' experience working in an industry or field that involves handling of particulate materials, which may include operations in the oil and gas industry that involve the handling of such materials. As discussed above, I meet these criteria (both now and as of the time the '689 Patent was filed) and therefore qualify as a POSITA for the '689 Patent.

28. Alternatively, I understand that Patent Owner's expert Mr. Anderson asserts that a POSITA for the '689 Patent would have (1) a degree in mechanical engineering or perhaps petroleum or civil engineering with at least 2 years experience engineering the structural and/or mechanical aspects of aggregate transferring equipment, or (2) if some other engineering degree, 4-6 years of hands-on experience engineering the structural and/or mechanical aspects of aggregate transferring equipment.¹ As discussed above, I meet these criteria (both now and as of the time the '689 Patent was filed) and therefore qualify as a POSITA for the '689 Patent even under Mr. Anderson's definition.

29. Mr. Anderson's definition also has several flaws. First, Mr. Anderson ignores that the '689 Patent discusses that the alleged inventions described therein involve *use* of the disclosed systems. For example, the '689 Patent states that aspects of the disclosed inventions include:

- “a method of setting up an apparatus” as disclosed, including:

¹ EX2004, ¶27-28.

- Identifying an area of ground surface for deployment of the apparatus that is level and clear of obstructions
- Positioning the apparatus by towing the apparatus to that area
- Connecting the apparatus to a power source to provide power to the control assembly and other components
- Removing the apparatus from a travel configuration by operating lift actuators, deploying outriggers and landing legs, and deploying ramps
- “a method of operating an apparatus” as disclosed, including:
 - Positioning the chute over the port(s) of one or more silos,
 - Positioning a vehicle over the unloader structure
 - Initiating operation of the extension conveyor, elevating conveyor, and base conveyors
 - Unloading aggregate from the aggregate transporting vehicle.²

30. The ‘689 Patent inventors also clearly directed their invention to use in oil and gas applications. Indeed, the only real-world application that the ‘689 Patent describes for these uses is “the process of hydraulic fracturing in connection with subterranean petroleum drilling”.³ Moreover, 11 of the 12 references cited on the

² EX1001, 13:35 – 15:38.

³ EX1001, 4:13-18.

face of the ‘689 Patent expressly relate to methods and systems for use in oilfield operations.

31. A POSITA reading these disclosures of the ‘689 Patent and its cited references would understand that experience using and observing the use of aggregate handling systems, particularly in oilfield operations, is equally relevant to the ‘689 Patent’s field of the invention and the level of skill in the art.

32. I also disagree with Mr. Anderson that the relevant experience for a POSITA is limited to experience with “aggregate transferring equipment”.⁴ Experience with the mechanical aspects of other types of equipment would be relevant to the field of the ‘689 Patent, at least because engineering other such equipment often involves the same types of engineering concepts and calculations (*e.g.*, loads, stresses, etc.) as those involved in designing aggregate transferring equipment. For example, the design of a self-erecting or mobile tower crane similarly involves creating a collapsible and transportable tower crane that can be erected for use. When erect, it has a substantially vertical structure with a substantially perpendicular structure extending away from the vertical structure, designed to lift and move a load from one location to another. An image of a Liebherr mobile tower crane is shown below. Experience designing the mechanical

⁴ EX2004, ¶¶27-28.

aspects of these types of systems would also be relevant to a POSITA designing systems like those in the '689 Patent.



VI. GROUND 1: MOTIVATION TO COMBINE WALDNER AND DYNATEK

A. Conveyor Extension Assembly

33. Mr. Anderson asserts that a POSITA would not understand the discharge chute member 242 of *Waldner* to be a “conveyor extension assembly” or an “extension conveyor for moving aggregate” because “it is gravity that imparts motion to the aggregate” and not the discharge chute.⁶ I disagree with this statement.

34. The Dictionary of Mechanical Engineering defines a conveyor as:

“A device for moving parts or materials from one place to another, usually over a short distance and/or from one level to another, often on a continuous band called a ‘conveyor belt... See apron

⁵ EX1130, pg. 1.

⁶ EX2004, ¶36.

conveyor; band conveyor; bucket conveyor; chain conveyor; drag conveyor; **gravity conveyor**; non-carrying conveyor; pneumatic conveyor; pneumatic tube conveyor; roller conveyor; vibrating conveyor.”⁷

35. Similarly, the Illustrated Dictionary of Mechanical Engineering defines conveyor as:

“A mechanical apparatus for carrying or transporting materials from place to place. Types include apron, belt, chain, **gravity**, roller, monorail, overhead, pneumatic, vibrating, etc.”⁸

36. Moreover, a person of ordinary skill in the art would have known and been familiar with “gravity conveyors.” Gravity conveyors rely on gravity to impart motion to items that they convey. Gravity conveyors have been known for decades. For example, US 2,980,222 was issued in 1961 as an improvement to existing gravity conveyors.⁹ Further, Ashland Conveyor Products compares power conveyors to gravity conveyors, and notes that “gravity conveyors can offer transportation of items with a lower cost.”¹⁰ Therefore, a POSITA would not necessarily believe that the discharge chute member of *Waldner* cannot qualify as a “conveyor” merely because it relies on gravity to impart motion to the aggregate. Therefore, in my opinion, to the extent PO’s construction requires the conveyor itself to impart motion to the aggregate, I disagree with that construction.

⁷ EX1131, pg. 2.

⁸ EX1132, pg. 3.

⁹ EX1133, 1:15-23.

¹⁰ EX1134, pg. 2.

B. Increased Range of Motion

37. Mr. Anderson asserts that a POSITA would have had no motivation to optimize the range of motion of Waldner's system because he asserts that Waldner's chute "has a wide 'range of motion'".¹¹ However, it is clear from a thorough reading of EX1004 that the system is designed to fill a single silo, with its optional telescoping chute only providing greater accuracy of final fill positioning, not for re-positioning the discharge chute to fill multiple silos.

"...backing the trailer into a position placing its second end **adjacent a storage bin or tank** places the outlet port 60 **close to the inlet of the bin or tank**. Although not shown for the first embodiment, a discharge chute may be coupled to the outlet port 60 of the bucket elevator and have an actuator, Such as a hydraulic cylinder, that is operable to move a discharge end of the chute relative to the outlet port 60 of the bucket elevator. This way, an operator can **adjust the point of final discharge** of granular or particulate material from the system without having to move the trailer."¹²

38. In order to fill the next silo, the Waldner system would need to collapse, be driven to the next silo, and deploy once again. This is an obvious limitation of the Waldner system. A POSITA would have strong motivation to save time, and increase the efficiency of the process, by enabling the system to fill many silos in a single deploy. For instance, before Masaba created its design, Solaris had a six-silo offering arranging the silos in a closely spaced grouping (see EX1043 stating "designed to move 400 TPH of Frac Sand at 100 PCF and feed into the hatches of each silo in a 6-Pack," on page 2 and schematic on page 4).¹³

¹¹ EX2004, ¶41.

¹² EX1004, 15:11-21 (emphasis added).

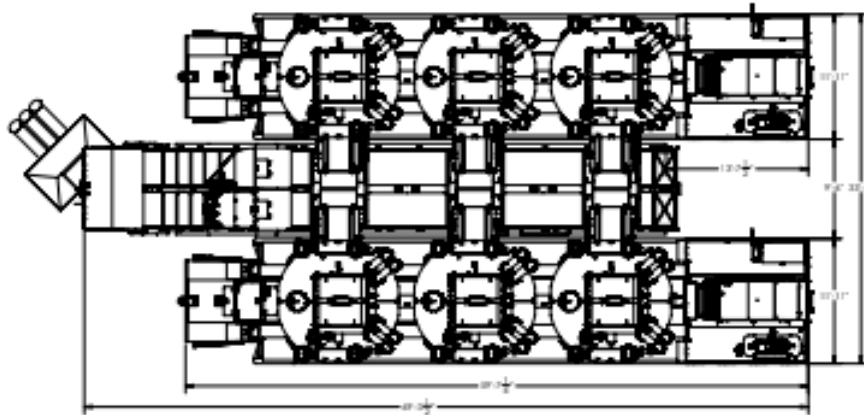
¹³ EX1043, pages 1-2 and 4.



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39. It would be very tedious to fill all six silos with the Waldner system. A POSITA would have recognized that the ability to fill six silos during one deployment is superior to filling only a single silo. To accomplish this, the reach of the horizontal conveyor from the top of the system would need to both increase sufficiently to reach the furthest silo and reduce in reach sufficiently to also service the closest silo.

¹⁴ EX2008, pg. 9.

¹⁵ EX1124, pg. 2.

¹⁶ *Id.*

40. In order to operate the Waldner system as desired with these types of silo arrangements, a POSITA would look to maximize its rotation and reach¹⁷ and have enhanced mechanical control.¹⁸

41. A POSITA would begin by looking to existing solutions. A POSITA would have recognized at least four existing solutions: an articulated airslide (e.g., as in EX1014 at page 20), a telescoping conveyor belt, a telescoping gravity fed chute (e.g., as in EX1004), and an articulated belt conveyor (e.g., as in EX1005). These four options were the most obvious and proven mechanisms to perform this operation, and a POSITA would be familiar with the existence of each and would understand the design constraints and tradeoffs associated with implementing each.

i. Angle of Repose

42. Key to this analysis is the behavior of granular material on an incline. Unlike a liquid, granular media does not always flow down an inclined chute (e.g. the chute is not steep enough). This would be immediately obvious to a POSITA familiar with the angle of repose, or critical state friction angle, for different types of media. The angle of repose refers to the angle between the horizontal and the natural slope of a pile of granular material. It is also the approximate angle required before granular material will begin to slide down a gravity fed chute. If a chute is at a lower angle than the angle of repose the media will not slide. Pertinent to this

¹⁷ EX1003, ¶118.

¹⁸ *Id.*

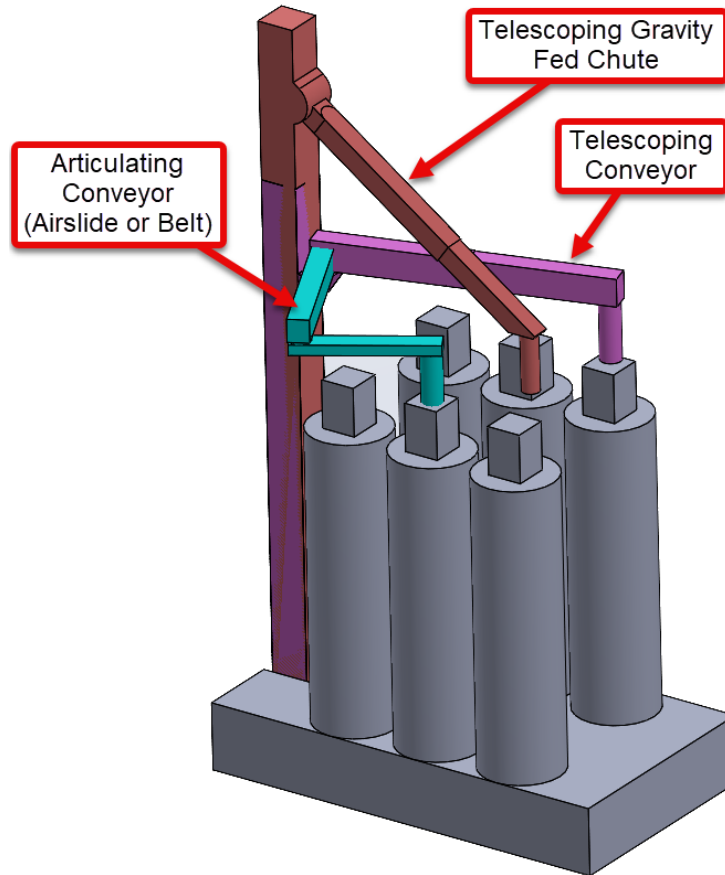
system is the angle of repose for dry sand, which is approximately 34 degrees.¹⁹ This means that a gravity fed chute must be at least 34 degrees from horizontal for the sand to predictably flow. Indeed, Mr. Anderson acknowledges that the discharge chute would need to be maintained at an angle “sufficient to allow the required material flow rates”,²⁰ and a POSITA would understand this to be at least 34 degrees for the present application.

ii. Geometry

43. A POSITA would have recognized physical and geometric limitations for each conveyor option. This section will illustrate these limitations. As will be discussed later in this section, the articulating airslide and the articulating belt conveyor are almost identical in their reach capability and thus will be analyzed together. The following images represent the three types of systems. They were created in SolidWorks to interact with silos drawn to scale.

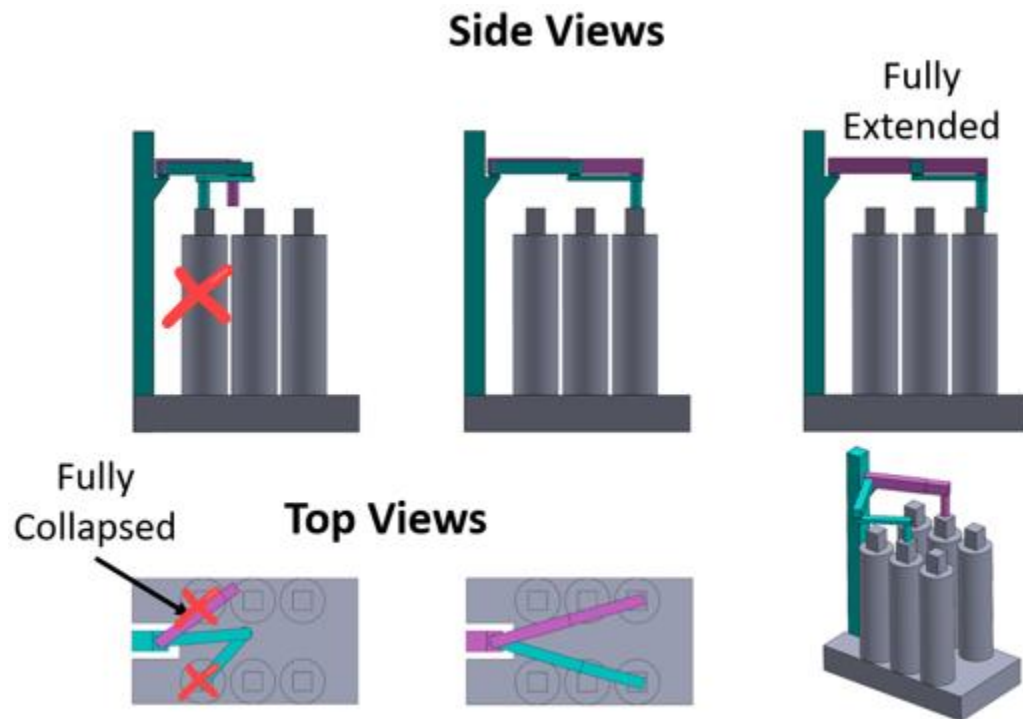
¹⁹ EX1151, pg. 3 at Table 2.

²⁰ EX2004, ¶¶41 and 43.

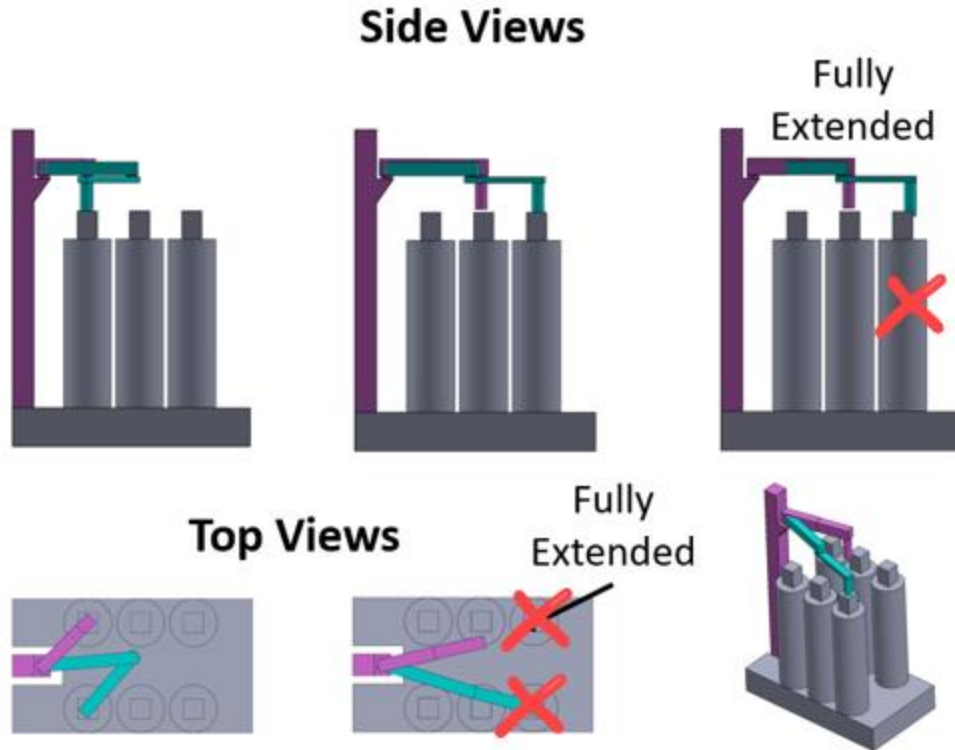


44. The telescoping belt conveyor will first be compared against the articulating belt conveyor. As can be seen below the articulating belt conveyor (green) and the telescoping belt conveyor (pink) are exactly the same length when fully extended. The articulating conveyor (green) can easily reach every silo. The telescoping conveyor can reach the furthest silos but can only collapse sufficiently to reach the middle silos and cannot collapse enough to reach the closest silos, which are shown with a red “X” below. This limitation is due to the nature of the telescoping conveyor. It can only rotate from side to side from the pivot close to the tower and retract a little less than half of its length (this is always true due to the

need for overlap of the two telescoping sections). Because of the limited degrees of freedom of the design it cannot reach all six silos.

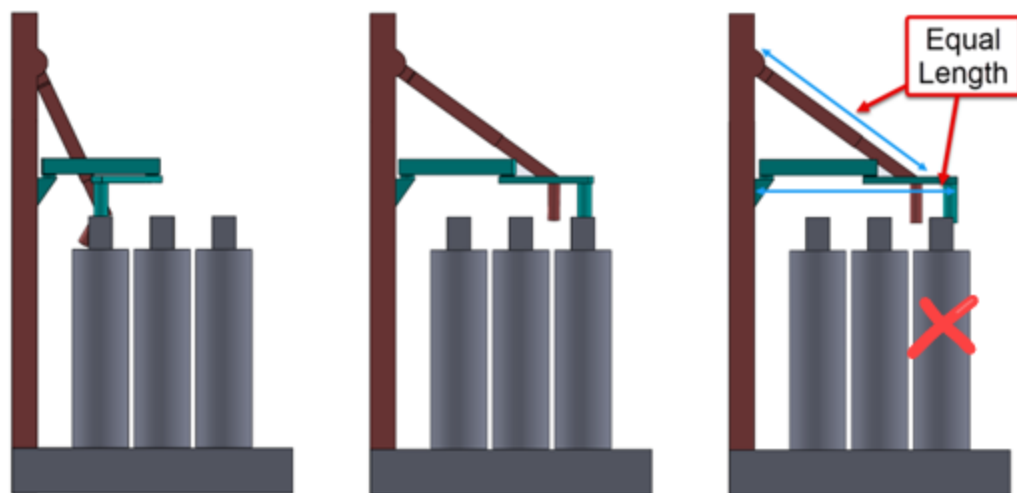


45. Further, the model was adjusted so that the telescoping belt conveyor could collapse sufficiently to reach the nearest silo by reducing the length of both sections equally. As can be seen in the figure below, now that the telescoping conveyor is sufficiently short enough to reach the closest silos, it is not capable of reaching the furthest silos when fully extended, again shown with a red “X” below. The articulating belt conveyor on the other hand has sufficient length and degrees of freedom with the addition of the rotation at the intersection of the two members to reach any of the six silos with ease.



46. The telescoping gravity fed chute will next be compared against the articulating conveyor. As can be seen below, the articulating conveyor (green) can reach all six silos. However, assuming the same length of conveyor and the articulating conveyor being sized to just reach the furthest silos, the telescoping gravity fed chute (brown) cannot reach all of the six silos, even though the tower is significantly taller than the tower for the articulated conveyor.

Side Views



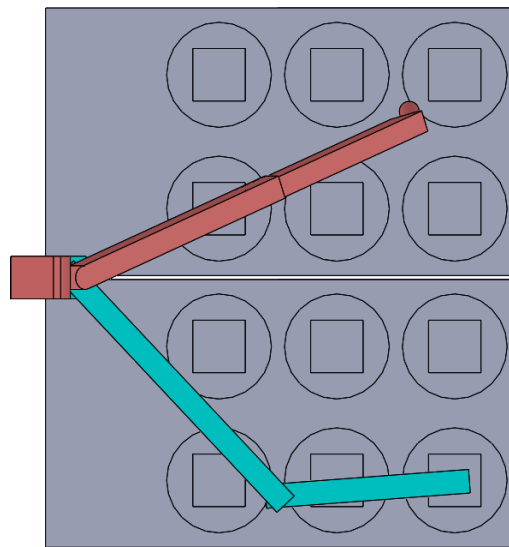
Top Views



47. Additionally, if sized to reach the farthest silos, the telescoping chute would not be able to reach the silos nearest to the tower without changing the downward angle of the chute. Changing the downward angle of the chute would require a further increase to the height of the tower, and the addition or lengthening of a retractable drop chute so that the aggregate is not lost between the end of the telescoping chute and the silo port.

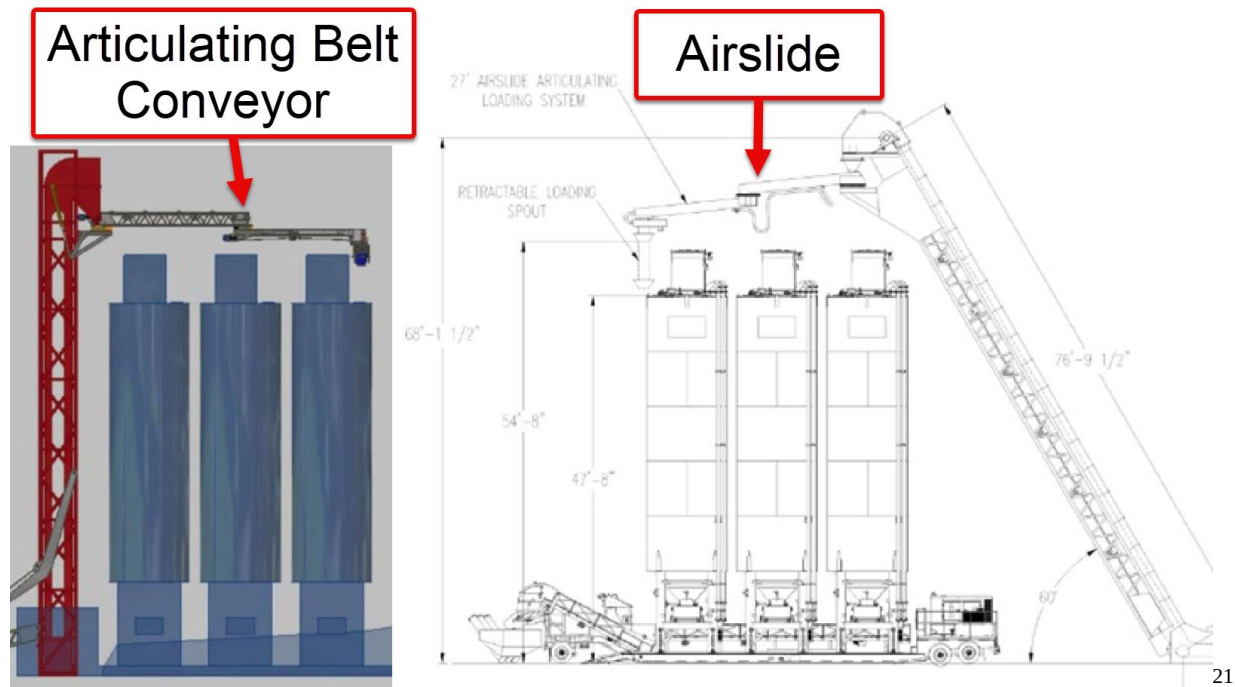
48. The disadvantages of the taller tower, required for the telescoping chute, will be discussed in detail in the next two sections titled “Complexity” and “Transportability when Collapsed”.

49. It is interesting to note that the articulating belt conveyor at this same length is capable of not only reaching all of the six silos shown above, but with a little extra length is even capable of reaching an additional six silos as seen in the figure below. The figure also illustrates how the telescoping chute system cannot reach all twelve locations.



50. Indeed, the evidence presented by Patent Owner confirms that Masaba arrived at the final design simply by iterating through the handful of options that would have been obvious to a POSITA. The first device Masaba considered, according to Patent Owner, was the articulated airslide. This device relied on both gravity and an air assist to transport media. As one can see in the image below, it was very similar looking in profile, and ultimate function, to the articulated belt

conveyor, although it did require some slope (typically somewhere between 4-10 degrees). Both options had an articulating second section giving great flexibility to the placement of media as has been illustrated above.



51. If the airslide could operate at the small angle from horizontal shown in Masaba's concept, it would not have required much additional height, and also posed a similar simplicity to the gravity fed telescoping chute. It is probable that Masaba considered the airslide option first for these reasons, but abandoned it due to the difficulty of moving sand at such a small angle from horizontal, and the potential for failure and stuck loads, even with air assist. The fact that the next concept Masaba pursued is the telescoping chute further suggests that the confidence

²¹ CORRECTED Patent Owner's Responses 05-09-25, pgs.13 & 17.

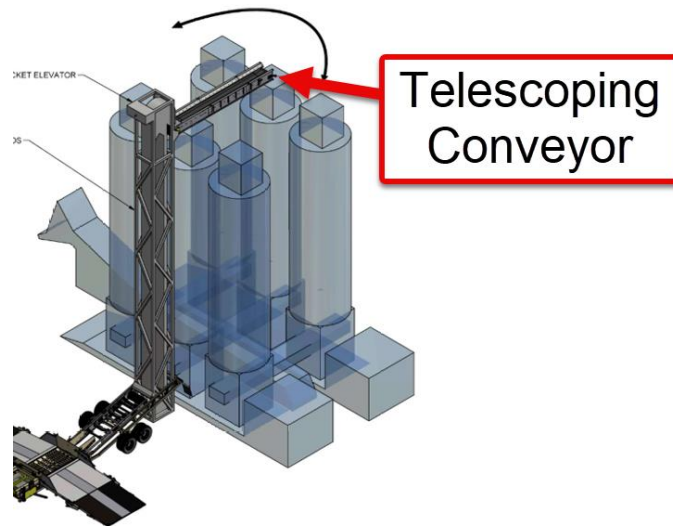
[illegible]

Telescopic Chutes
delivering media
to 3 different silos

52. Masaba next considered the telescoping conveyor belt after abandoning the telescoping chute. The reasoning they give for abandoning the telescoping conveyor was that they concluded “that it would not fold down sufficiently for the system to be road-portable.”²³ While this may have been true, there were also obvious geometric constraints of a telescoping conveyor, with its limited ability to reduce its length to service the silos nearest the tower. Though this option did not

23 CORRECTED Patent Owner's Responses 05-09-25, pg.16.

require additional tower height, it did not meet the requirement of filling all six silos in one deploy.



24

53. Both a telescoping gravity fed chute and an articulating conveyor system would have been capable of filling a six-silo system, as has been illustrated above. However, there would have been obvious advantages and disadvantages that would have led a POSITA to choose the articulating conveyor. The pertinent factors for a POSITA to evaluate would have included: complexity of the system and transportability of the system when collapsed. Those factors are addressed below.

iii. Complexity

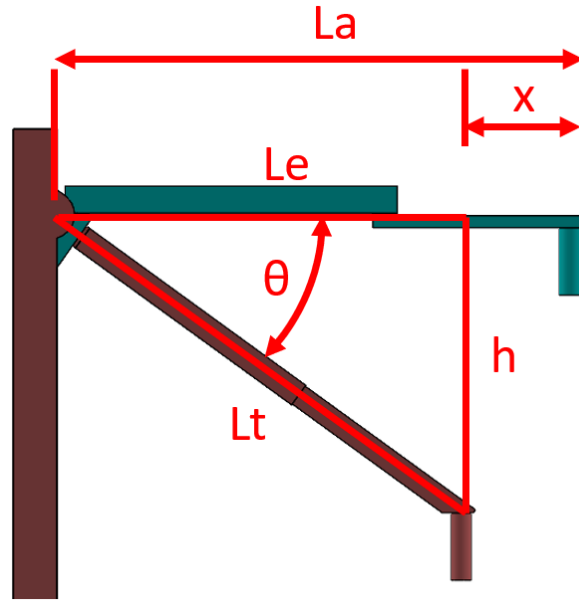
54. A POSITA would have immediately recognized that the articulating conveyor is a more complex system than the telescoping gravity fed chute. The inherent advantage of a gravity fed system is that the system does not need to provide

²⁴ CORRECTED Patent Owner's Responses 05-09-25, pg.15.

the force required to move the media. An articulating conveyor system needs additional motors and bearings, and requires additional power to move the media horizontally. Mr. Anderson asserts that a POSITA designing a system according to *Waldner* could avoid these complications of an articulating belt conveyor by simply making the bucket elevator taller or its discharge chute longer.²⁵ Though the use of gravity, instead of another power source, in the telescoping chute appears to be free at first glance, once the entire system is considered, it is clear that the energy savings is not real, but is merely shifted to another part of the system. In this case, the vertical bucket tower must increase in height to enable gravity to move the media horizontally. This is true if the reach of the system is similar to the reach of the articulating belt conveyor.

55. As discussed previously the magnitude of this additional height requirement depends on the type of media and its angle of repose (34-degree decline from horizontal for sand). In addition to the increased height, the length of the telescoping gravity fed chute will have less reach than an articulating conveyor system of the same length. The geometric relationship between these two options is illustrated in the diagram below.

²⁵ EX2004, ¶43.



56. In an attempt to compare the telescoping chute system (brown) as closely as possible to the articulating system (green) in the above diagram, the telescoping chute length (L_t) is the same as the articulating conveyor length (L_a). In addition, the diagram shows the telescoping chute rotated down from the same exit point from the tower as the articulating conveyor which illustrates the change in height (h) as a decrease in final conveyor exit height. In order to meet the requirements of the angle of repose for sand the telescoping system has been rotated 34 degrees (θ) from horizontal. The diagram also illustrates the difference in reach (x). Geometry dictates the following relationships.

$$\begin{aligned}
 L_t &= L_a \\
 L_e &= L_t * \cos(\theta) \\
 h &= L_t * \sin(\theta) \\
 x &= L_t - L_e
 \end{aligned}$$

57. By setting the length of both systems (L_t and L_a) to equal 1 the geometric relationships are revealed. If $L_t \& L_a = 1$ then $h = 0.559$ and $x = 0.171$. This means for every foot of horizontal length, the telescoping chute will need to increase in height .559 feet to maintain the same exit height and will have .171 feet less reach than an articulating belt conveyor of the same overall length. For example, I understand from the Declaration of Mr. Jeremy Weinstein of Solaris that the lateral distance from the location where the bucket elevator would be deployed to the outlet of the silo in Solaris' preexisting six-pack silo arrangement that is farthest away from that location was about 50 feet.²⁶ To reach that lateral distance at an appropriate angle θ , a telescoping chute would need to be about 10 feet longer than an articulated belt conveyor, and attached at the top of a bucket elevator that is about 33 feet taller. Stated another way, if the articulating belt conveyor has a reach of 50 feet (which is approximately the length that would have been required to reach to the farthest silo outlet in Solaris' six-pack²⁷) a telescoping chute of equal length as compared to the articulating conveyor would need to be attached at the top of a bucket elevator approximately 28 feet taller, and that telescoping chute would have approximately 8.5 feet less reach than an articulating belt conveyor of the same length, and would not be able to reach the furthest silos.

²⁶ EX1112, ¶15.

²⁷ *Id.*

58. A POSITA would have easily seen these factors and their geometric relationships when comparing these two options. The next logical step would be to consider the ramifications of the additional height requirement for the gravity driven telescoping chute. Though additional height is undesirable when considering factors such as ease of use, safety, and cost, these factors could end up being less important than the additional complexity of the articulating conveyor. To continue the evaluation, a POSITA would have next considered the effect this added height would have on transportation.

iv. Transportability when Collapsed

59. One major element of the complete conveyor system is its ability to fill many silos in different locations. A stationary conveyor system would be far too costly. Waldner supports this assertion.

“The reference draws particular attention to the problem of long vehicle unloading times and limited space to allow unloading of multiple vehicles simultaneously. This reference discloses storage containers that have their own dedicated auger, screw or bucket conveyors running vertically up the tank wall in order to fill the tank from an upper inlet. However, ***one potential drawback is the notable cost of incorporating a dedicated conveyor at every proppant Storage tank.***”²⁸

60. The Waldner system, along with others, is a “portable conveyor system”²⁹. The designers of these systems recognize the importance of utilizing the same equipment to fill many different silos in different locations. Further, the inventors listed on the ’689 Patent considered “road portability” an important

²⁸ EX1004, 1:41-49 (emphasis added).

²⁹ EX1004, 1:14-15; *see also* EX1006, 38:3-24.

concern.³⁰ Therefore, a POSITA would have recognized that transportability was an important customer need.

61. Special permits and fees are required for oversized loads. These permits may include planning out special routes, which bypass overpasses of insufficient height or roads that can only accommodate a limited length or weight. Oversized loads may also require one or multiple escort vehicles. The further outside of the typical dimensions for road travel would increase the cost to plan out special routes, and could limit access to locations.

62. The regulation on height for oversized loads was explained by Masaba “A POSITA would understand that to be road legal, the overall system would need to be preferably below 13.5 feet and at least below 14 feet high.”³¹ By staying below the 14 ft height, and preferably below a 13.5 ft height, a vehicle can pass under most any overpass in route to the final destination. This could have been achieved by folding down the chute or the conveyor to meet the 14-foot maximum height requirement (as will be discussed further in section E. “Transport Height of System”). This type of articulating would have been well known to a POSITA. For example, Waldner folds down its telescoping chute system to meet this requirement.³²

³⁰ EX2004, ¶36.

³¹ CORRECTED Patent Owner’s Responses 05-09-25, pg.38.

³² EX1004, Fig. 16.

“When actuator 270 is adjusted to place the discharge member 242 in alignment with the bracket-equipped side of the elevator frame 254, collapse of actuator 266 ***pulls the discharge end 246a of the discharge member 242 inwardly toward the elevator frame 254***, thus establishing ***a collapsed position*** of the discharge member 262 ***lying generally parallel to the bracket equipped side of the elevator frame 254***.”³³

63. Other factors that would have affected transportability are the vehicle’s length and weight. As discussed previously, the bucket elevator of a gravity driven telescoping chute system would need to be approximately 33 feet taller than the bucket elevator having an articulating conveyor system to be capable of filling silos of the same height. This height would add to the length in the collapsed state. This means the collapsed system with a telescoping chute would be around 128 feet long. A taller bucket elevator also would be heavier, which would require more powerful lift structures for deploying it, stronger axles and more fuel for transportation. A taller bucket elevator also would have required a taller frame surrounding the bucket elevator, which would further increase the weight of the system. When collapsed, a taller bucket elevator would have made the unit more difficult to maneuver and would have required additional space for storing the collapsed unit. Both the additional length and weight would put further limitations to the locations and routes taken during transport.

64. Moreover, all else being equal, increasing the length of the *Waldner* discharge chute also would have made it heavier and more difficult to manipulate,

³³ EX1004, 26:12-19 (emphasis added).

both while deploying it and while using it to fill silos. Even if a POSITA could modify the construction or materials of the discharge chute to compensate for this issue, those modifications would have added further complication and potentially required re-testing and re-qualifying the chute to confirm that it met other safety or operational requirements. With those added complications, a POSITA would not necessarily have considered increasing the length of the discharge chute to be a better solution than using a conveyor like that disclosed in *Dynatek*. These complications contradict the dismissive statement made by Masaba below.

“a POSITA could easily accomplish this by ***merely increasing the length*** of Waldner’s chute and, if necessary, increasing the height of the bucket elevator (***while keeping everything at a transportable height/length***).”³⁴

65. Masaba’s argument neglects all of the factors explained above, unless Masaba is suggesting that a POSITA would choose to shorten the system in order to match the length and weight of the articulating conveyor option, and thus derate the system to only fill silos that are 33 feet shorter than is typical. The telescoping chute modification for filling multiple silos either requires a significant increase in height and weight, reducing the transportability, or requires a reduction in the height of the silos serviced. These limitations make the added complexity of an articulating conveyor system a small matter in comparison.

³⁴ CORRECTED Patent Owner’s Responses 05-09-25, pg.31 (emphasis added).

66. After considering all the other options, a POSITA would have had a clear motivation to combine the Dynatek Econoloader system with the Waldner system. An articulating conveyor, such as the system provided by the Dynatek Econoloader, would optimize the rotation, reach, and mechanical control of the Waldner system.³⁵ The articulating belt conveyor was the only existing system, out of the other known and common options, that could perform all of the necessary functions and meet all the design requirements for the system.

C. Discharge Rates

67. Mr. Anderson asserts that a POSITA would not be motivated to replace *Waldner's* discharge chute with a conveyor having a faster particle discharge rate because the discharge rate of the overall system is already set at the loading point.³⁶ Certainly the discharge chute of *Waldner* cannot and would not dispense more aggregate than is dispensed onto the unloader, and would not need to be designed to unload aggregate faster than it can be dispensed from the truck onto the unloader. But Mr. Anderson assumes that every system disclosed by *Waldner* (or that might be built according to *Waldner's* disclosure) would already be designed to accommodate the maximum possible discharge rate of any truck that might be used to unload sand into it. But *Waldner* includes no such teaching, and due to the high demand for proppant, many different methods and techniques for hauling it have

³⁵ EX1003, ¶118.

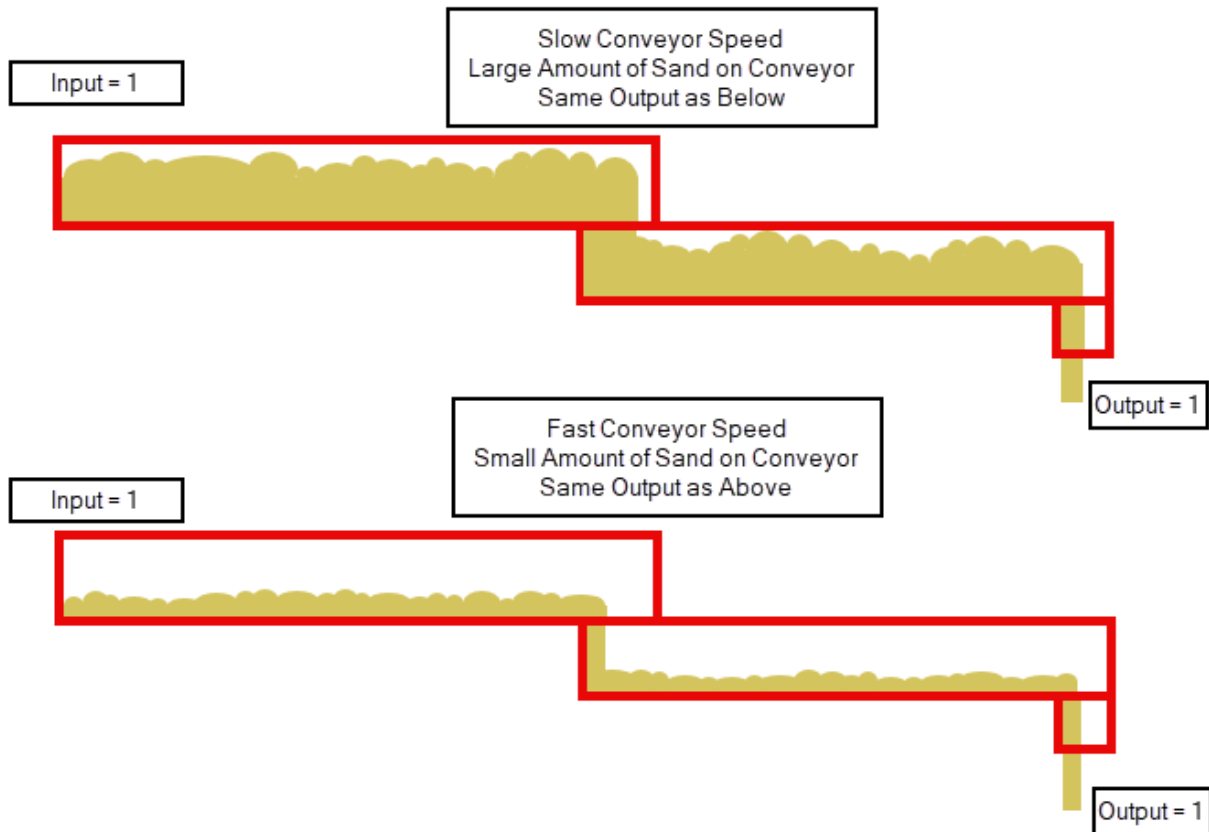
³⁶ EX2004, ¶44.

been and are being tested and evaluated for efficiency. Accordingly, a POSITA would have understood that parameters of the system could be designed and modified to accommodate new methods.

68. Assuming a larger input rate, a POSITA would still have been motivated to ensure that the discharge rate from Waldner's discharge chute is faster than upstream components of the system. Mr. Anderson asserts that "a POSITA would not be motivated to replace [the discharge chute] with something faster,"³⁷ but Mr. Anderson did not consider the effects of the material weight on the discharge chute. A POSITA would have further wanted to minimize the weight of the discharge chute of *Waldner* and its contents, including the weight of the sand being carried on the chute. As sand piles up on the upper conveyor, that would increase the overall weight and the stress on the system. This is illustrated below. Therefore, a POSITA would have been motivated to increase the discharge rate from the discharge chute, for example, by using a motorized conveyor even if that would not increase the discharge rate of the overall system.

³⁷

Id.



69. Mr. Anderson also asserts that, even if a POSITA were motivated to increase the particle discharge rate of *Waldner's* chute, the POSITA could do so by simply increasing the diameter of the chute.³⁸ This alternative could cause a number of problems. For example, all other things being equal, a wider discharge chute would have been heavier and increased the stress on the system. A wider chute is likely taller as well as the chutes are typically round tube. The wider and taller chute also increases the difficulty of folding for transportation and storage. The increased throughput in a wider chute may also require re-designing the width of the outlet of

³⁸ EX2004, ¶46.

the bucket conveyor or the components that connect it. In view of these drawbacks, a POSITA would have at least considered *Dynatek's* teaching of using a conveyor belt to increase particle discharge rates instead of widening the chute.

D. Belt Mistracking & Other Conveyor Belt Issues

70. Mr. Anderson asserts that a POSITA would have been concerned about modifying *Waldner's* discharge chute to include belt conveyors because of concerns that the conveyor belt would mistrack if it is not mounted and maintained side-to-side level.³⁹ I disagree that the risk of mistracking would dissuade a POSITA from modifying *Waldner's* discharge chute to include conveyor belts, as discussed in EX1003.⁴⁰ The following tracking issues have been known and addressed in industry for proper operation of a belt conveyor: improper off-center belt loading, frozen/jammed pulleys, unlevel frame, material build-up on pulley and rollers, and pulleys and rollers out of line.⁴¹

71. By 2021, a POSITA would have recognized that a conveyor mistracking is not unlike getting a flat tire in a car. You do not expect to get a flat tire every time you drive, but if you drive enough, you expect to get a flat tire at some point. Additionally, when you get a flat tire, it is typically a common fix that the tire repair shop can take care of in short order. Similarly, conveyors that are not

³⁹ EX2004, ¶¶ 54-59.

⁴⁰ EX1003, ¶152.

⁴¹ EX1135, pg. 10.

perfectly level side to side are used regularly, and while they do sometimes result in mistracking, in my experience, those instances are the exception. And when they do happen, known methods can be employed to fix the issue.

72. There are a number of things that a POSITA would have known can be done during the design and manufacturing process to reduce the probability of conveyor mistracking. For instance, as taught in the Lewco Belt Installation, Tracking and Maintenance Guide published in 2018, designing the conveyor so that it runs from the idle end to the drive pulley end reduces tracking issues.⁴² Designing the system so that the conveyor generally runs in a single direction (as opposed to forward and reverse) also reduces tracking issues. Lewco further teaches to ensure the conveyor frame is tight and square, and that couplings and mounting bolts are tight and secure to prevent mistracking and allow consistent tracking adjustments to be made.⁴³ Lewco further teaches to ensure head and tail pulleys are square and parallel in the conveyor frame, and that they roll freely and are not worn, lagging or seized.⁴⁴ Lewco also instructs that ensuring proper belt tension helps with proper tracking.⁴⁵ Further, as taught by U.S. 3,545,599, sensors can be used to determine when the belt is off-center, and corrective action can adjust the belt.⁴⁶ The Uni

⁴² *Id.*, pg. 4.

⁴³ *Id.*, pg. 5 and 8.

⁴⁴ *Id.*, pg. 6.

⁴⁵ *Id.*

⁴⁶ EX1136, Abstract; 2:22-35; and 3:38-45.

Chalns engineering manual published in 2015 notes that “measures can be taken to guide the belt such as edge guide wearstrips on the side of the frame or a flange on the sides of the roller to track the belt.”⁴⁷

73. There are also a number of likely scenarios that can lead to mistracking after installation. A POSITA would have known and been able to check and prevent these to a large extent, or fix them when mistracking occurred. For example, the Lewco Belt Installation, Tracking and Maintenance Guide published in 2018, teaches examining the belt, ensuring it is free from debris, tears, twists or deformations can reduce mistracking.⁴⁸ Further ensuring the rollers are free from scratches, particulates or residue will have the same effect. Properly adjusting the snubber rollers also prevents mistracking.⁴⁹ When mistracking occurs Lewco advises to check the following potential causes, which are all well known and routine fixes for a POSITA:

Tracking issues can be caused by:

- Improper off-center belt loading
- Frozen or jammed pulleys
- Frame or structure crooked/not level
- Material build up on pulleys/rollers
- Pulleys/rollers out of line
- Unequal belt length on left and right sides (belt was not cut straight) ⁵⁰

⁴⁷ EX1150, pg. 20.

⁴⁸ EX1135, pg. 5.

⁴⁹ EX1135, pgs. 9-10.

⁵⁰ EX1135, pg. 10.

74. Indeed, a POSITA would have understood that moveable conveyor belt arms, like those disclosed in Dynatek, would very likely have incorporated many of the above features to avoid belt mistracking. Even Mr. Anderson acknowledged that a POSITA would have expected that systems for handling aggregate in this field would have been subjected to frequent inspections and maintenance – even multiple times a day during use – during which such techniques could have been employed to prevent or fix belt mistracking.⁵¹

75. Further, a POSITA would have known how to minimize the set up or deflection related factors that result in the side-to-side-out-of-levelness that Mr. Anderson discusses. For example, there were numerous types of leveling and stabilizing devices (outriggers) and other techniques for designing and setting up industrial equipment, including moveable conveyors in order to avoid these issues and ensure a level set up. For example, at least as early as 2019 GES Engineering made a fully automatic system for leveling vehicles and other platforms weighing up to 40 tons in less than 4 minutes with a precision of 0.2 degrees. GES cited cranes as a potential application, and a POSITA would recognize that such a system could also be used for a conveyor system.⁵² Further, a POSITA would be familiar with finite element analysis (FEA) which is a computer simulation used during the design

⁵¹ EX1113, at 54:12 – 55:8.

⁵² See generally EX1137.

process to analyze stress and deflection of the conveyor system. Using FEA, a POSITA could have (and regularly would have) anticipated and corrected unwanted deflection that might result in mistracking due to out-of-levelness during the design stage, ensuring proper operation once actually built.

76. Indeed, *Waldner* already discloses a lower conveyor and a vertical bucket conveyor that should be kept side-to-side level to avoid mistracking. The same forces that could cause a conveyor belt to mistrack at the position of *Dynatek's* discharge chute could cause similar issues with the lower conveyor and the vertical bucket elevator. And, to address that issue, *Waldner* discloses several features to ensure that the bucket elevator and overall system remains level. For example, *Waldner* discusses the use of support legs to stabilize the trailer and maintain its level orientation,⁵³ which would help keep the lower conveyor level, the bucket elevator vertical and the conveyor belts at the position of *Waldner's* discharge chute level. *Waldner* also discusses a control system with tilt sensors that are used to detect level and unlevel conditions of the transportable frame that carries the bucket elevator,⁵⁴ which would also detect an unlevel condition of conveyor belts at the position of *Waldner's* discharge chute. *Waldner* discloses that this combination of elements can be used to keep the system level during setup and during operation of

⁵³ EX1004, 24:4 – 25: 6.

⁵⁴ EX1004, 28:1 – 30: 30.

the conveyor system.⁵⁵ Therefore, particularly in view of *Waldner's* own disclosure, it would have been well within the skill of a POSITA to install measures to keep the system sufficiently level to avoid belt mistracking.

77. Mr. Anderson also asserts that wind would push a belt conveyor at the position of the *Waldner* discharge chute into a position where they are not level and exacerbate belt mis-tracking issues.⁵⁶ The same solutions discussed above disclosed in *Waldner* and known to a POSITA would address these problems and stabilize the conveyor. Moreover, to the extent that wind forces could increase the risk of belt mistracking, if the *Dynatek* system and/or conveyor belts would be heavier than *Waldner's* discharge chute as Mr. Anderson asserts,⁵⁷ then the additional weight would tend to make conveyor belts less susceptible to being blown into un-level positions by wind. This is not dissimilar to how an empty soda can would easily blow off of a picnic table in the wind outside, while a full soda will remain stationary in the same wind. Finally, to the extent that the belt conveyor of *Dynatek* has less surface area than the chute of *Waldner*, it may be less susceptible to the effects of wind.

⁵⁵ EX1004, 28:48 – 29:60.

⁵⁶ EX2004, ¶60.

⁵⁷ EX2004, ¶60 (“a conveyor belt system such as the Dynatek EconoLoader is much larger and heavier than comparable discharge chutes...”).

E. Transport Height of System

78. Mr. Anderson asserts that attaching the *Dynatek* Econoloader to *Waldner*'s bucket elevator frame would have resulted in a system that was too tall (in the transport configuration) to be transported on highways in most states.⁵⁸ His conclusion is based heavily on assumptions that are not necessarily true. I disagree with his analysis and with his opinion that such a result would have made that combination not obvious to a POSITA.

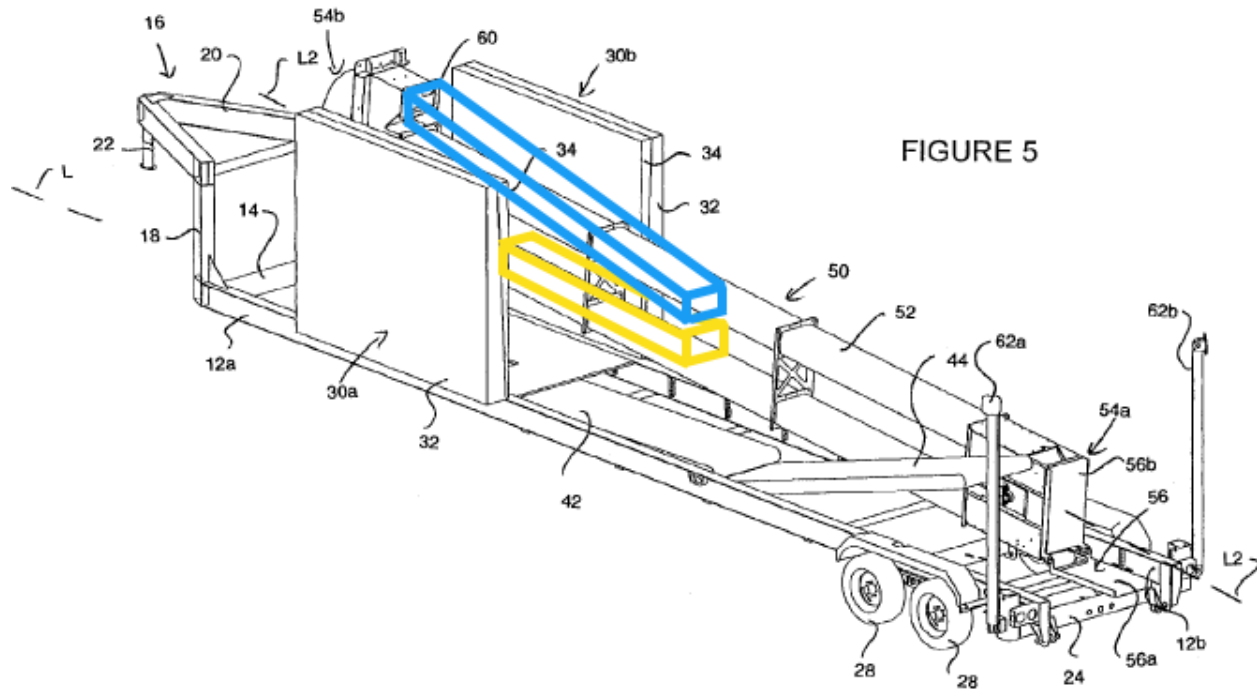
79. First, Mr. Anderson assumes in his calculations that the figure in *Waldner* that he uses for his calculations (Figure 6) is drawn to scale. A POSITA would recognize that Figure 6 of *Waldner* is more of an idealized schematic that is not necessarily intended to show the relative dimensions of different components with any degree of precision. He also assumes that the Econoloader conveyor used would have the same dimensions as depicted in the images from *Dynatek* that he used. However, *Dynatek* did not include dimensions in the drawings of the EconoLoader shown, and *Dynatek* specifically states that "Every DYNATEK EconoLoader is custom-engineered for the application."⁵⁹ In view of these disclosures, a POSITA would not assume the dimensions of the *Dynatek* EconoLoader that Mr. Anderson assumed in his calculations.

⁵⁸ EX2004, ¶61.

⁵⁹ EX1005, pgs. 2-3.

80. Moreover, even if Figure 6 of *Waldner* and the images in *Dynatek* show the dimensions that would be used in the proposed combination, a POSITA would have understood that the *Dynatek* Econoloader need not be “double-stacked”⁶⁰ on top of the bucket elevator as Mr. Anderson assumes. *Dynatek* discloses that the EconoLoader’s arms can be rotated with respect to each other about the outer pivot joint such that they are not fully aligned with each other. According to the proposed combination, the inner arm of *Dynatek*’s EconoLoader would also be pivotally mounted on *Waldner*’s bucket elevator frame. When *Waldner*’s bucket elevator frame is in the transport configuration, there is an open space next to the bucket elevator as shown below, where the articulated upper conveyor could be stored. A POSITA would have looked to utilize the open space and position the EconoLoader’s arms take advantage of the open space.

⁶⁰ EX2004, ¶61.

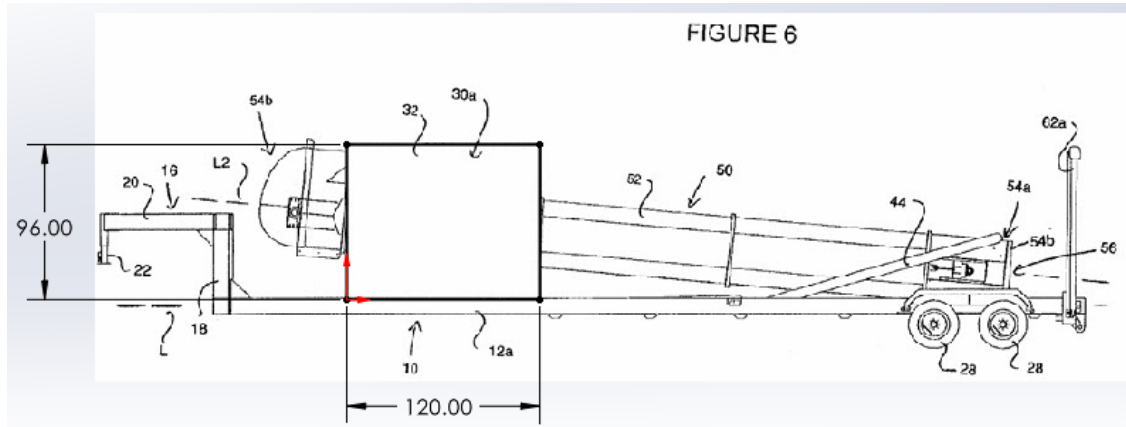


81. A POSITA would have been able to position the EconoLoader's arms as shown above simply using the pivoting functionality described in *Dynatek* that is already present in the EconoLoader. As shown above, this would not increase the height of Waldner as the outlet port 60 is positioned above the upright conveyor section and the articulated upper conveyor could fit in approximately the same vertical space as the outlet port 60.

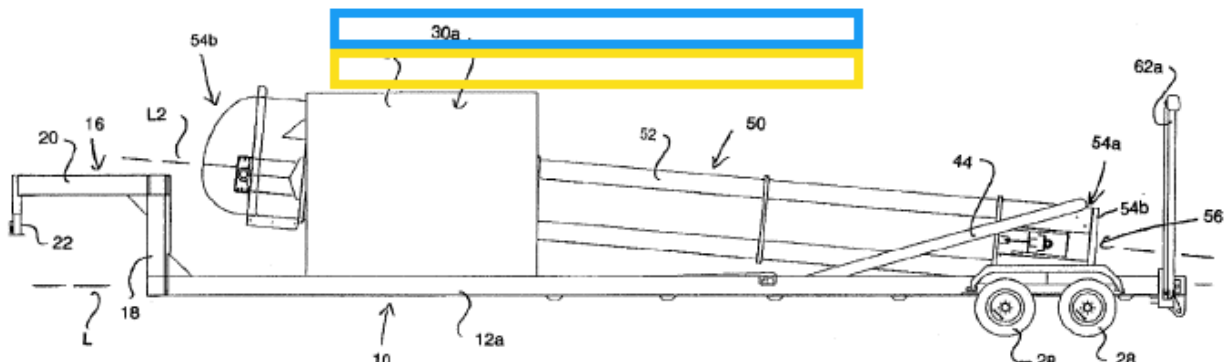
82. Further, Mr. Anderson's calculations,⁶¹ make assumptions that are illogical and misleading. First, he states that the ramps are approximately square, and that they would need to be about 10 feet wide, making them also 10 feet tall. However, the ramps in figure 6 and Waldner are clearly rectangular not square, and

⁶¹ *Id.*

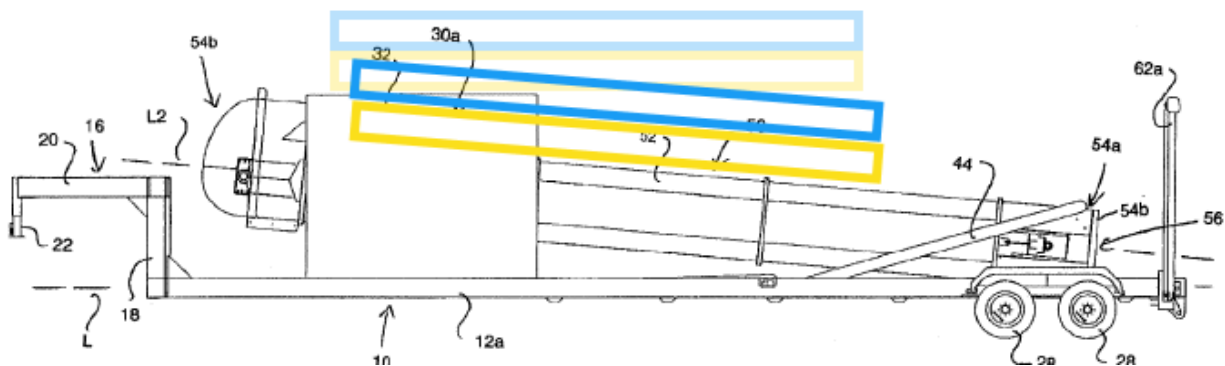
measuring (as Mr. Anderson did with the EconoLoader picture), a POSITA would have concluded that the ramps, or the vertical side of the rectangle is only 8 feet tall (assuming Mr. Anderson's proposed 10 ft width). The results of the measurement in SolidWorks showing this are shown below.



83. Mr. Anderson also assumes that both upper conveyor sections would be stacked above the tallest point on the image in figure 6, completely ignoring the open space to the right of the outlet port 60 where the upper conveyor would naturally be. Mr. Anderson's arrangement is depicted below.



84. A POSITA would have understood that this is illogical and that the conveyor sections should be positioned closer to the vertical conveyor frame, and takes up much less vertical space than Mr. Anderson proposes. This is shown below.



85. Mr. Anderson proposed that the overall height for the modified Waldner system in the transport configuration would be about $10 + 5$ to $6 + 1 = 16$ -17 ft. However, this is using the arrangement depicted as “Mr. Anderson’s arrangement” in Paragraph 84. Using the height of the ramps reflected in Waldner (8 ft instead of the 10 ft) and the more logical placement of the conveyor sections shown immediately above (adds 2.5-3 ft instead of 5-6 ft), even the arrangement with the conveyor sections stacked directly on top of each other would result in a total height of about $8 + 2.5$ to $3 + 1 = 11.5$ to 12.5 feet in the transport configuration. That height would have complied with state highway regulations in all states, and a POSITA would have recognized that it is readily transportable.

86. Finally, even if using the *Dynatek EconoLoader* would result in a system that is as tall as what Mr. Anderson theorizes (unlikely), a POSITA still

would have deemed the alleged invention in the ‘689 Patent claims obvious. First, a POSITA would have understood how to make basic adjustments to the dimensions of the *Dynatek* system to meet any limitations on the transportable height on the system. These types of adjustments were and are commonplace for mechanical engineers designing this type of equipment, and those changes would not necessarily require substantially redesigning the components to make the system just a few feet shorter. If a POSITA would have reconfigured the bucket elevator of Waldner by increasing its height⁶² or reconfigured the discharge chute of Waldner to increase its diameter,⁶³ as Mr. Anderson suggests, a POSITA certainly would have understood how to make these basic adjustments.

87. Even using the height of the arrangement calculated by Mr. Anderson, a POSITA would not have expected that such a system would be impossible or prohibitively difficult to transport. In heavy industries, it was (and still is) typical for equipment suppliers and operators to have to obtain permits to transport oversized equipment on certain roadways, and to plan transport routes that will accommodate the larger than standard size. In particular, known silos that the *Waldner* system might have been used to fill were often as tall as 80 feet,^{64,65} and so *Waldner*’s bucket elevator for filling them would necessarily already exceed most

⁶² EX2004, ¶¶41 and 43.

⁶³ EX2004, ¶46.

⁶⁴ EX1153, pg. 3.

⁶⁵ EX1138, pg. 4.

state highway regulations for trailer length (53 ft) without a special permit. Since *Waldner's* system would already require permits due to the height of its bucket elevator (*i.e.*, the length in the transport configuration), a POSITA would not have been dissuaded from using the *Dynatek* conveyor simply because its height also may require special permits or routes.

88. Finally, as shown above, even a combined *Waldner / Dynatek* system that exceeds the height would still fall within the scope of the '689 Patent claims.

F. Differences Between '689 Patent Inventors Design and *Waldner* or *Dynatek*

89. Mr. Anderson discusses several aspects of the design reflected in the '689 Patent figures and asserts that these are substantially different from the features of *Dynatek* or *Waldner*, or were even “creative and unique”⁶⁶ ways of arranging those components. However, all of these features would have been well within the knowledge of a POSITA and within their level of skill to implement in *Waldner*, either alone or in combination with *Dynatek*.

90. In paragraph 63 of his report, Mr. Anderson suggests that use of a slider bed style of belt conveyor – as opposed to a traditional roller style – would make it so a POSITA would not have a reasonable expectation of success.⁶⁷ I disagree. Mr. Anderson appears to be very familiar with slider bed style belt conveyors, and is

⁶⁶ EX2004, ¶63.

⁶⁷ *Id.*

easily able to point out differences. The existence of slider bed belt conveyors and the differences between slider bed and roller supported conveyors would have been well known to a POSITA. Slider bed style belt conveyors were commercially available long before the '689 patent as shown by the US Patent No 4,789,056 which issued in 1988. The '056 patent teaches a frame, a slider bed and head and tail idler rollers. “When loads such as impact loads are placed on the conveyor belt, the slider bed supports the conveyor belt at the point where the material is loaded. This action resists sagging and stretching of the conveyor belt and also reduces wear on the idler rollers.”⁶⁸ In another example, Hytrol, a producer of conveyors since 1947, has an instructive article from 2019 explaining the pros and cons of slider bed “belted conveyors” in comparison to “live roller conveyors.”⁶⁹ Certainly slider bed conveyors were known as of the priority date of the '689 patent, and the fact that the design of the slider bed style belt conveyor is not a part of the claims in the '689 patent is also evidence that the choice to use a slider bed type of conveyor is not novel, but well within the ordinary skill in the art.

91. In paragraph 64 of his report, Mr. Anderson suggests that because the mounting system of Waldner was not used by the inventors of the '689 patent, that the combination of Waldner and Dynatek Econoloader was not obvious.⁷⁰ I

⁶⁸ EX1139, Abstract.

⁶⁹ See generally EX1140.

⁷⁰ EX2004, ¶64.

disagree. Clearly, the chute of Waldner and the conveyors of Dynatek are different. One is angled while the other is horizontal. Clearly, a POSITA would have understood that a different mounting system would be required, and would try to implement the slewing ring based pivot of Dynatek. A POSITA would have known that the slewing ring needs to be mounted in a horizontal configuration, and that the bottom support for the stationary portion of the slewing ring would need to be a platform at least as big as the slewing ring. A POSITA would have known how to, and would be motivated to use a platform for mounting the slewing ring, and would be able to design and implement such a platform with folding capabilities as required by the basic design specifications. This is an every-day type task for a POSITA, and a POSITA would have had every expectation of success in implementing such a system.

92. Mr. Anderson further describes that the mounting system for conveyor in Waldner uses a single actuator instead of the two actuators used in the '689 patent.⁷¹ He explains that two actuators with mounting points outside of tower frame spread the load. I don't disagree, but more importantly, the choice to use two actuators more likely had to do with accomplishing the desired motion of the upper conveyor. The decision to use two actuators versus a single actuator, or moving mounting points outside of the tower frame, and mounting the actuators on either

⁷¹ *Id.*

side of the frame are nothing more than a design choice, guided by the customer needs and design specifications. They are logical, common solutions and a POSITA would have every expectation of success implementing them.

93. In paragraph 65, Mr. Anderson again discusses conveyor belt mistracking, and states that “a POSITA reading the ‘689 Patent would recognize that the inventors of the ‘689 Patent went to great lengths to prevent mistracking of the articulated slider bed belt conveyors.”⁷² I disagree. In reality, the ‘689 patent does not say anything about “preventing mistracking” or making any of the components “plumb.” The patent further does not claim “preventing mistracking” or making components “plumb.” If the inventors of the ‘689 Patent really did go to great lengths, one would expect those efforts to be protected by the claims. Mr. Anderson points to three things - guy wires, outrigger arms, and stabilizer legs.

94. While the ‘689 Patent does mention attaching guy wires, as part of the deployment, it does not mention the purpose and does not claim anything to do with guy wires. There is no mention that the guy wires are used to make the upright conveyor plumb. Guy wires provide stability and support to tall, free-standing structures. While the guy wires help with strength and stress, there is no teaching to suggest that these are meant to prevent belt mistracking. Further, guy wires were well known and common for upright structures prior to the ‘689 Patent.

⁷² *Id.*, ¶65.

95. As it pertains to outriggers and stabilizing legs, these are common features on mobile equipment. Aerial lifts, cranes, fire trucks, excavators, RV's and trailers can all utilize outriggers and/or stabilizer legs. They are not new. They help reduce motion and help support moments or overhanging loads. There is nothing unusual about the way the outriggers and stabilizer legs are implemented. Further, Waldner discloses stabilizer legs as well as their purpose: "So deployed, the outriggers brace the trailer against movement in order to provide stability during setup and/or use."⁷³

96. A POSITA would have had a reasonable expectation of success implementing known features of guy wires, outriggers and stabilizer legs according to known methods.

VII. GROUND 1, CLAIM 6: "CONVEYOR SUPPORT FRAME"

97. Mr. Anderson asserts that a POSITA would understand that the "conveyor support frame" of claim 6 must be "the support structure that connects the conveyors to the bucket elevator frame and **not** the support structure that is part of the conveyors".⁷⁴ He appears to base this on looking only at component 154 of Figure 8C of the '689 Patent.

98. However, the relevant claim language of claim 6 reads "a conveyor support frame supporting the segments of ***the extension conveyor on the aggregate***

⁷³ EX1004, 15:54-56.

⁷⁴ EX2004, ¶¶74-75.

elevating assembly”. A POSITA would not necessarily parse this language the way that Mr. Anderson suggests. In particular, a POSITA would have understood that the phrase “on the aggregate elevating assembly” may simply specify that the extension conveyor is located “on the aggregate elevating assembly”, not the location of the frame relative to the aggregate elevating assembly. Indeed, in several instances, the ‘689 Patent claims recite a claim element and later restate the location or association of that element (*e.g.*, see claim 1 reciting that the extension conveyor is articulated “with an inboard segment and an outboard segment”, and then subsequently reciting “the inboard segment *of the extension conveyor*” and “the outboard segment *of the extension conveyor*”).

99. Moreover, the ‘689 Patent figures also show truss frames surrounding the conveyors, for example, in Figure 8C as highlighted below.

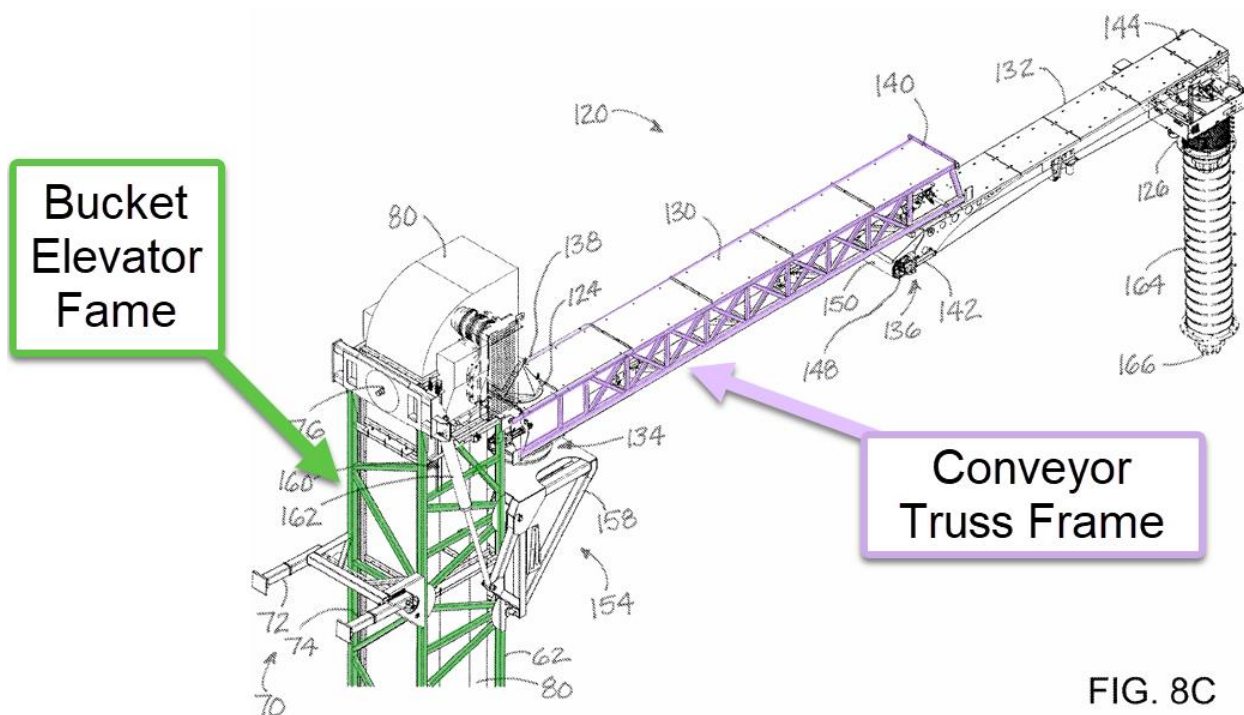


FIG. 8C

100. To the extent that the truss frames in *Dynatek* would not “connect the conveyors to the bucket elevator frame” when combined with *Waldner*, neither do these truss frames. However, nothing in the specification indicates to a POSITA that those frames could not also be “conveyor support frame[s] supporting the segments of the extension conveyor on the aggregate elevating assembly”.

101. Even if a POSITA would understand claim 6 to require that the conveyor support frame is attached to the deployable frame as PO and Mr. Anderson seem to suggest, the proposed combination of *Dynatek* with *Waldner* would meet that limitation. In making the proposed combination, a POSITA would attach a truss frame around the conveyor (or *Waldner*’s discharge chute) like that disclosed in *Dynatek* to the bucket elevator frame of *Waldner* in a manner that allows the chute

or conveyor to move relative to the deployable frame. Therefore, a POSITA would attach the proximal end of *Dynatek's* truss frame to *Waldner's* bucket elevator frame using, for example, *Waldner's* brackets 252, links 256, and pins 258 or similar components known to a POSITA.

VIII. GROUND 3: WALDNER IN VIEW OF DYNATEK AND AULD

A. Cement and Aggregate

102. Masaba argues that Auld is not analogous art because it only discusses a silo for storing cement.⁷⁵ However, in my experience, a POSITA would have recognized that these components are very similar with regard to the needs for designing and implementing them. Concrete is commonly composed of three components: cement, aggregate (sand or gravel) and water. All three components are integral, and so a system used for handling concrete is necessarily used for handling cement.

103. Both the concrete and hydraulic fracturing industries require the conveyance of aggregate, such as sand, and the equipment used is similar. Hydraulic fracturing boomed between 2006 and 2015.⁷⁶ Concrete production has been a staple for over a century. Accordingly, a POSITA would have looked to the more mature concrete industry while building systems for handling similar materials in the hydraulic fracturing industry.

⁷⁵ PO response, pg. 59.

⁷⁶ EX1141, pg. 2.

104. In fact, as Mr. Anderson acknowledges, his former employer Appco is an example entity that transitioned from the concrete industry to the fracturing industry and would have been familiar with the equipment and components used there. Mr. Anderson notes that “Prior to my arrival at Appco, the company’s primary focus was on storage and conveyance of aggregate in the quarry, cement making, and mining industries.”⁷⁷ Mr. Anderson notes that Appco took what they knew from that work and applied it to systems for conveying frac sand, and the same engineers who had worked on systems for cement making worked on the systems for conveying frac sand.⁷⁸

B. Kingpin / Fifth Wheel Connections and Gooseneck Connections

105. Mr. Anderson asserts that a fifth wheel / kingpin connection would not have a more even distribution of load across the bed of the transport vehicle than a gooseneck connection.⁷⁹ In many situations, fifth wheel and goose neck connections on trailers are interchangeable, but each has its own advantages and disadvantages. For example, 5th wheel hitches are well known to enhance stability, and generally offer smoother, quieter towing. Gooseneck hitches are primarily designed to attach to a ball in the bed of a pickup truck. Gooseneck hitches are less invasive, are typically less expensive, and take up less space in the truck bed.⁸⁰

⁷⁷ EX2004, ¶9.

⁷⁸ EX2004, ¶9; see also EX1113, at 26:9 – 27:18.

⁷⁹ EX2004, ¶147.

⁸⁰ EX1142, pgs. 1-2.

106. Further, gooseneck hitches are primarily made for pickup trucks. Fifth wheel hitches can be made for pickup trucks but heavier duty fifth wheels are also made for semi-trucks. Goosenecks and fifth wheels made for pickup trucks generally have capacities of up to 30,000 lbs.⁸¹ Fifth wheels for semi-trucks can support up to or more than 55,000 lbs of vertical weight and can pull weights as high as 150,000 lbs.⁸² Determining the correct hitch for the weight of the conveyor or trailer to be attached is well within the abilities of a POSITA, and a POSITA would understand that for towing something over 30,000 lbs, a semi-trailer fifth wheel would be the most appropriate solution.

C. Placement of Kingpin in Waldner

107. Mr. Anderson asserts that mounting a hitch coupler or kingpin to *Waldner's* bucket elevator 50 would cause problems because the bucket elevator 50 is off-center relative to the wheels 28 as shown in Figure 7.⁸³ I disagree with this view.

108. As an initial matter, Mr. Anderson's opinions seem to rely on Figure 7 of *Waldner* and the placement of the kingpin on the bucket elevator in that particular embodiment. However, *Waldner* discloses several embodiments of the disclosed system that differ from the embodiment in Figure 7, all of which would be relevant

⁸¹ *Id.*
⁸² EX1143, pg. 2.
⁸³ EX2004, ¶150-151.

to the proposed combination of *Waldner* with *Auld*. For example, Figure 15 of *Waldner* shows another embodiment in which the bucket elevator is configured differently and includes a frame surrounding it. And in each embodiment the bucket elevator would be positioned somewhat differently. This would teach a POSITA that *Waldner's* bucket elevator and/or its frame could be reconfigured and/or repositioned to allow the kingpin to be mounted in a workable location.

109. If a POSITA would have reconfigured the bucket elevator of *Waldner* by increasing its height⁸⁴ or reconfigured the discharge chute of *Waldner* to increase its diameter,⁸⁵ as Mr. Anderson suggests, a POSITA would have been able to adjust the position of the bucket elevator to be centered on the trailer.

110. As an example of such an arrangement, *Sleeman* shows that the vertical elevating assembly 24 includes bucket elevators 34 surrounded by a frame 26 that is pivotally connected to a base frame 12. As shown, for example, in Figures 3 & 15 (in the operational position) and Figure 2 (in the collapsed transport position), frame 26 is centered on frame 12. And *Sleeman* discloses that base frame 12 can be used as a trailer frame for readily transporting the entire system.⁸⁶ This disclosure further confirms that a POSITA would have understood that *Waldner's* bucket elevator

⁸⁴ EX2004, ¶¶41 and 43.

⁸⁵ EX2004, ¶46.

⁸⁶ EX1006, 15:35-38, 38:3-12.

and/or its frame could be positioned to be centered relative to *Waldner's* trailer frame.

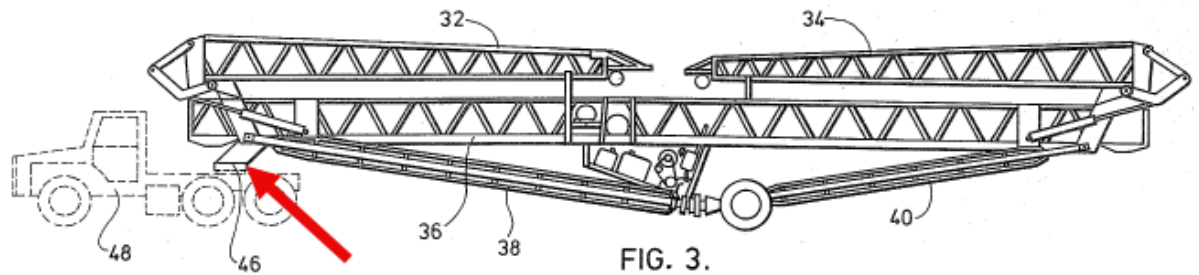
111. Indeed, claims 12 and 25 of the '689 Patent recite that the kingpin is mounted on the deployable frame, not the bucket elevator, and so the kingpin need not be mounted on the bucket elevator to read on those claims. As stated in EX1003,⁸⁷ the teaching of *Auld* of a king pin mounted at the free / upper end of a vertically oriented structure was applied to the structures shown in *Waldner*, which include the vertical bucket elevator shown in all of the embodiments as well as the bucket elevator frames shown in Figures 11 and 15. Therefore, even if a POSITA was unable to center *Waldner's* bucket elevator itself on the trailer frame, a POSITA could reposition or resize (widen) the frame surrounding the bucket elevator such that the frame would be centered on the trailer frame. Even with this modification, the system would still achieve the same advantage discussed in EX1003 of reducing the total length of *Waldner's* trailer. Further, prior to the '689 Patent, there were numerous examples of systems in which a portable stacker/conveyor was attached via a fifth wheel/king pin mount.⁸⁸ A POSITA would have known how to modify the system of *Waldner* to accommodate this type of coupling.

⁸⁷ EX1003, ¶320.

⁸⁸ EX1144, FIG. 3; EX1145, FIG. 14; and EX1146, FIG. 1.

112. Indeed, a POSITA would have understood that it was known and common to attach a trailering coupler like a 5th wheel hitch, goose neck hitch, pintle hitch, or ball hitch directly to the conveyor. Several examples are shown below.

113. U.S. Patent 4,135,614 is titled Portable Radial Stacker and discloses that “FIG. 3 shows the stacker of FIG. 4 in one travelling position and affixed to the fifth wheel pin 46 of the truck 48”⁸⁹ Figure 3 of the ’614 patent is shown below.



114. Similarly, U.S. Patent 8,684,161 is titled Portable Low Profile Drive-Over Truck Dump Conveyor System and discloses a towable conveyor that allows belly dumps and end dumps to empty their loads onto the conveyor system.⁹⁰ The patent further discloses “Conveyor system 10 is generally comprised of a longitudinally extending frame 12 configured at first end 14 for connection to a towing vehicle and configured at second end 16 with a wheeled axle system 18 which allows conveyor system 10 to be easily transported on a roadway to a desired work site.”⁹¹ Figure 1 of the ’161 patent is shown below.

⁸⁹ EX1144, 5:56-58.

⁹⁰ EX1147, 2:46-55.

⁹¹ *Id.*, 2:28-33.

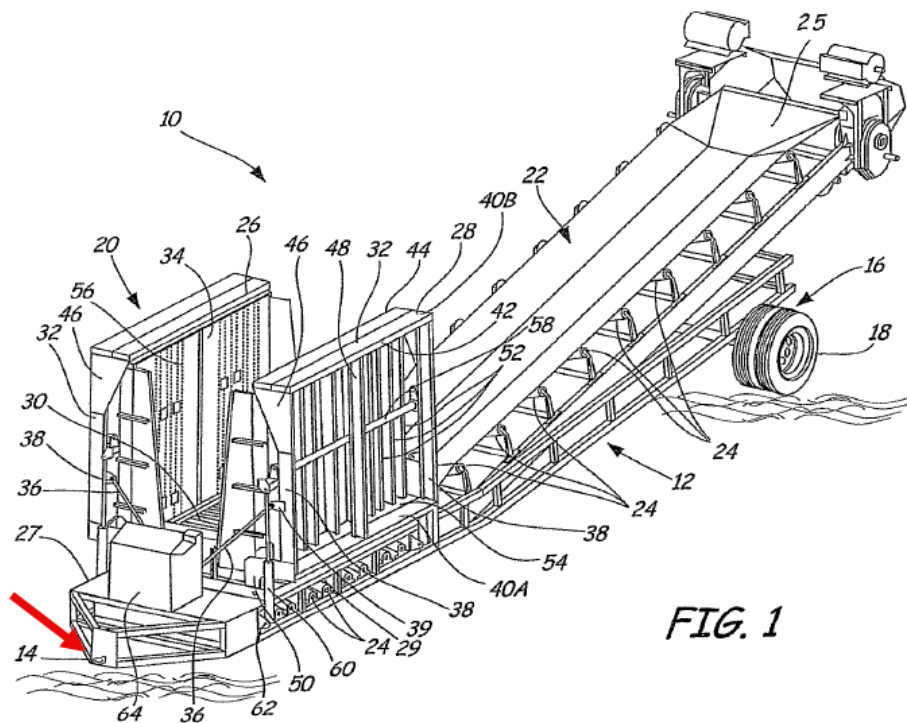


FIG. 1

115. In another example, U.S. Patent 10,414,599 titled Tracked Radial Stackers with Wheels teaches a that “Pivot point 32 is typically designed to be readily replaced with a fifth wheel king pin mount 33 (see FIG. 14) to be mounted to a tractor for transport to another site.”⁹² Figure 14 of the ‘599 patent is shown below.

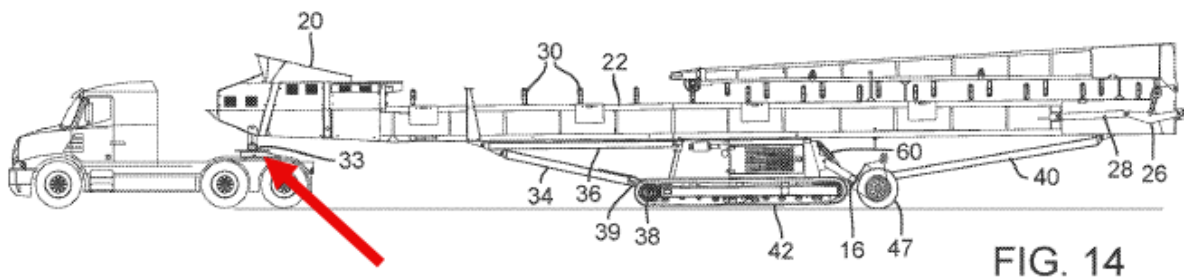


FIG. 14

⁹²

EX1145, 5:66-6:2.

116. U.S. patent 10,556,752 similarly discloses a fifth wheel hitch connected to a conveyor frame. “A tracked stacker is identified generally at 10 in the figures. FIG. 1 shows stacker 10 ready to be transported down a roadway with tracks 12 elevated and with the stacker being supported on a wheeled bogey indicated generally at 14. Stacker 10 is supported on the rear end by a fifth wheel connection 16 to a tractor 18. Stacker 10 includes a conveyor generally indicated at 20.”⁹³ Figure 1 of the ‘752 patent is shown below.

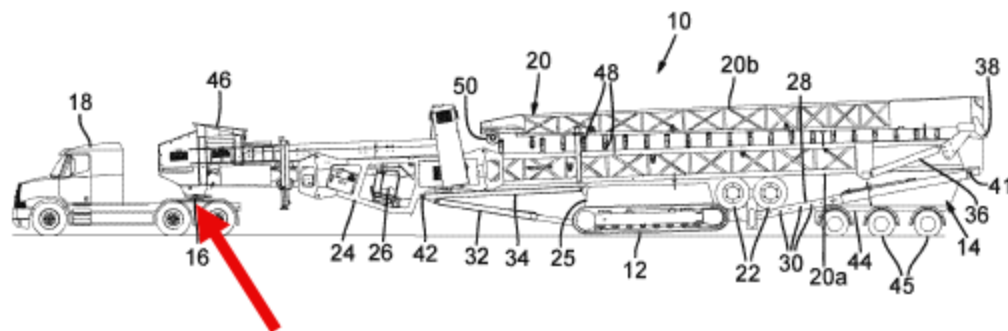


FIG. 1

117. In yet another example of what was known in the art, U.S. Patent Application 2007/0029170 titled Rolling Conveyor Support teaches “a stackable conveyor system 10 which may be fitted with an axle/wheel assembly 12 for transportation by a truck.”⁹⁴ Figure 1, below, clearly shows a fifth wheel connection mounted to the conveyor frame.

⁹³ EX1146, 5:39-45.

⁹⁴ EX1148, ¶14.

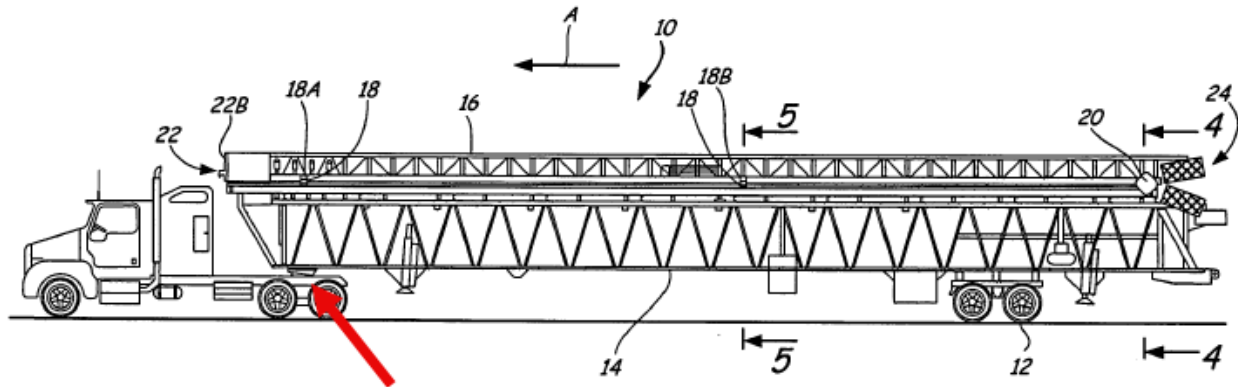


FIG. 1

118. Further, frameless trailers, such as those shown above where the conveyor frame provides the structural support for transportation, are common in many industries and have been well-known for many years. This has been done with many types of trailers including end dump trailers, pneumatic trailers, liquid tank trailers, and the like. A POSITA would have recognized that the placement of the hitch mechanism for a frameless trailer could provide the benefit of a reduction in the overall length of the trailer,⁹⁵ as well as reducing the overall weight. Examples of frameless trailers available before the priority date of the '689 patent are shown below.

⁹⁵ EX1003, ¶320.

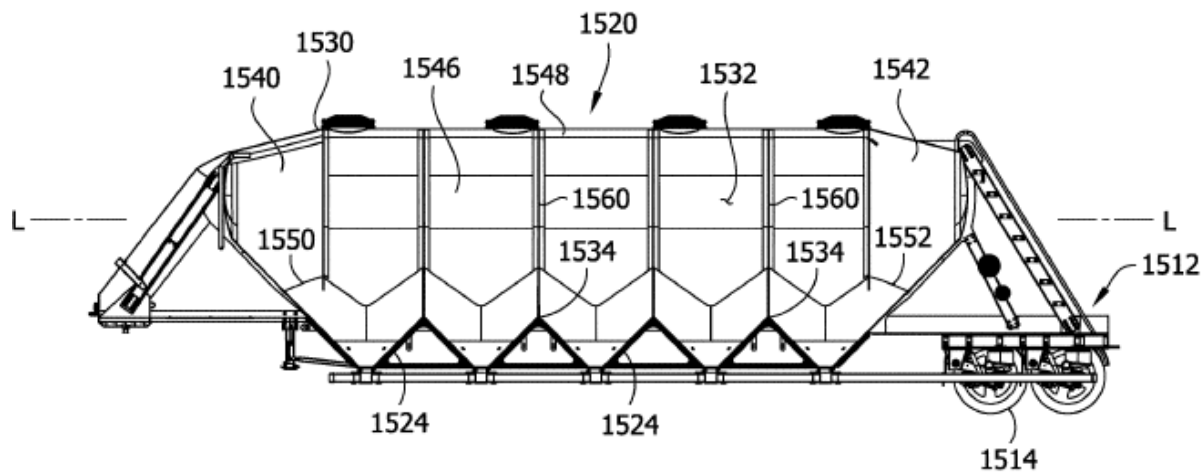


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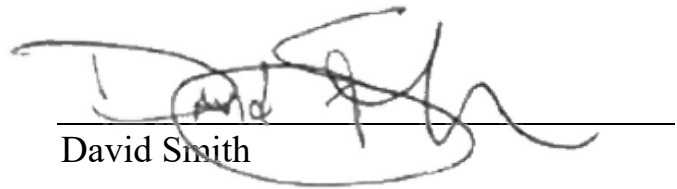
IX. DECLARATION

119. I hereby declare that all the statements made in this Declaration are of my own knowledge and true; that all statements made on information and belief are

⁹⁶ <https://www.youtube.com/watch?v=45d5MOldlm0>.
⁹⁷ EX1149, FIG. 17.

believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Executed in Meridian, Idaho on July 24, 2025.

A handwritten signature in dark ink, appearing to read "David Smith", is written over a horizontal line. The signature is stylized with loops and flourishes.

David Smith

APPENDIX A



CURRICULUM VITAE **DAVID G. SMITH**

PROFILE

Experienced mechanical engineer (MS, PE) with seven issued patents. Award winning inventor. President of Alpine Engineering and Design, a mechanical engineering consulting company with clients around the United States ranging from individual inventors to Fortune 500 companies. Worked on the development of multiple successful products including among other things: forklifts, forklift attachments, conveyors, aerial lifts, garbage trucks, thrill rides, ziplines, trailers, oil and gas equipment, exercise equipment, manufacturing equipment and multiple consumer products.

Graduated Cum Laude with a bachelor's degree in mechanical engineering. Completed a master's of science degree in mechanical engineering and an MBA with an emphasis in product development. Licensed professional engineer (PE) and a certified safety professional in comprehensive practice (CSP). Certified trainer for boom lifts, scissor lifts, rough terrain and counterbalanced forklifts. Nearly two decades of experience in product development, patents, equipment safety and risk assessments.

Experienced expert witness having drafted hundreds of reports/declarations in patent and personal injury cases. Designed and built multiple custom testing devices to obtain data and evaluate opinions. Created multiple demonstratives to explain the mechanics and circumstances of accident sequences and patented devices. Testified in deposition 30+ times and multiple times in trial.

CERTIFICATIONS

- Professional Mechanical Engineer (PE)
 - Utah License # 8645497-2202
 - Idaho License #19657
- Certified Safety Professional (CSP)
 - Comprehensive Practice License #CSP-30707
- Certified Forklift Operator
- Certified Counterbalanced Forklift Operator Trainer
- Certified Rough Terrain Forklift Operator Trainer
- Certified Aerial Boom Lift Operator Trainer
- Certified Aerial Work Platform (Scissor Lift) Operator Trainer



EDUCATION

Master of Business Administration (MBA) Marriott School of business Brigham Young University Emphasis in Product Development	2009-2011
Masters of Science - Mechanical Engineering Ira A. Fulton College of Engineering Brigham Young University Emphasis - Product Design, Mechanism Design, Compliant Mechanisms, MEMS	2008-2011
Bachelor's of Science - Mechanical Engineering Brigham Young University - Idaho Cum Laude Graduate Academic Scholarship Boy Scouts of America Scholarship	2002-2007

CONSULTING FOCUS

Involved in hundreds of consulting projects. Major areas of focus and expertise include: aerial lifts, boom lifts, bucket trucks, cherry pickers, scissor lifts, trailers, end dumps, side dumps, belly dumps, flat beds, goose neck trailers, 5th wheel trailers, trailer safety chains, towing systems, tarping systems, refuse trucks, recycling trucks, rear loaders, side loaders, automated trucks, front loaders, automated side loaders, fall protection, exercise equipment, forklifts, forklift attachments, powered industrial trucks, and telehandlers, rough terrain forklifts, drilling equipment, oil and gas equipment, heavy equipment, construction equipment, conveyors, roller conveyors, belt conveyors, screw conveyors, auger conveyors, hydraulic equipment, manufacturing equipment, consumer products, chairs and seating, stability and tipping, plastic design, zip lines, thrill rides, designing to standards, and design for safety.

PATENTS

During his time at Alpine Engineering and Design, Inc., Mr. Smith has become familiar with patent prosecution and patent litigation. He has written multiple provisional patent applications, and has worked with attorneys in writing the specifications, creating drawings and drafting claims for utility patents on products he has helped design. As part of the product development process, he has performed patent searches, both for informational purposes and to lessen the likelihood that new developments would infringe other's intellectual property. Mr. Smith is listed as an inventor on seven issued patents.

- 9,387,788 - Combination Trailer
- 9,616,799 - Pneumatic Tank Trailer
- 9,758,083 - Pneumatic Tank Trailer
- 9,789,916 - Pneumatic Tank Trailer
- 10,206,495 - Vehicle Receiver Hitch-Supported Cargo Rack
Transformable into a Picnic Table with Benches
- 10,683,176 - Material Placer
- 11,013,391 - Scraper Apparatus



3 | David G. Smith

EXPERT WITNESS

Mr. Smith has been retained as an expert on over 100 patent, and personal injury cases and has testified in a number of these. Mr. Smith has attended SEAK expert witness training and has experience and competency in the following areas:

Patent Invalidity/Non-infringement	Product Liability
Patent Infringement/Validity	Personal Injury
Prior Art Searching	Failure Reconstruction
Claim Construction	Safety

Mr. Smith has also been involved in multiple aspects of patent litigation including claim construction, prior art and patent searches, infringement/validity analyses and non-infringement/invalidity analyses on over 50 cases. Mr. Smith has worked on district court cases, IPR's, EPR's, and cases in the ITC. The following are a few of the categories of patent issues Mr. Smith has consulted on:

Trailers	Office Supplies
Agricultural Equipment	Food Processors
Trailer Tarping Systems	Blenders
Oil/Gas Drilling Equipment	Coffee and Tea makers
Weight Machines	Vacuum Cleaners
Athletic Equipment	Hospital Equipment
Archery Equipment	Cleaning Systems
Hinges	Car seat gap fillers
Seating/Chairs	Baby bottle warmers
Hand Tools	Cooler Latching Systems
Springs	Grills and Smokers

PEER REVIEWED PUBLICATIONS

- Off-axis Stiffness and Piezoresistive Sensing in Large-displacement Linear-motion MEMS (Brigham Young University, Master's Thesis, 2009)
- Piezoresistive Encoders for Ratcheting Actuation Systems (Sensors and Actuators A: Physical, Volume 165, Issue 2, February 2011)
- Design Optimization of a Linear-motion Large-displacement Micro Mechanism for High Off-axis Stiffness (ASME International Design Engineering Technical Conferences IDETC/CIE 2009)
- Metrics for Evaluation and Design of Large-displacement Linear-motion Compliant Mechanisms (Journal of Mechanical Design, 2012)

MAGAZINE AND WHITE PAPER PUBLICATIONS

- An Engineering Guide for Trailer Safety Chain Installation, Attachment and Use (White Paper, Linklock.net)
- Your Rear Impact Guard Questions Answered (Tracks Magazine, National Association of Trailer Manufacturers, September/October 2019)
- The Nuances of Advising on Product Liability Cases (Lawyer Monthly, January 2021)
- Community Highlights: Meet David Smith of Alpine Engineering and Design (Voyage Utah Magazine February 2022)



**PODCASTS,
BLOG ARTICLES,
AND OTHER
PUBLICATIONS**

- Host of The Expert Witness Podcast
- 9 Ways Engineering Analysis Adds Value to Your Manufacturing Operations
- 100% Defense Verdict in Forklift Case – Reviewed by a Mechanical Engineering Expert Witness
- The Safety Cliff
- Take the Handcuffs Off of Your Safety Managers
- What is a Provisional Patent Application?
- 7 Unexpected Lessons from Preparing to Launch a Product on Kickstarter
- 9 Ways to Find Your Next Expert Witness on a Single Cup of Coffee
- How to Make Money Inventing... Without Going Broke First
- Expert Opinion: Improper Forklift Operation Kills Delivery Driver
- Expert Opinion: Efficiency Improvements Result in Tractor Operator's Death
- Expert Opinion: No, Ma'am! The Swing Set Was NOT Vandalized
- Expert Opinion: Defective Auger Conveyor Amputates Employees Arm
- Expert Opinion: Improper Forklift Operation Kills Deliver Driver
- Expert Opinion: Just Because it Can Be Done Without Injury Does Not Mean it is Safe
- Expert Opinion: Engineering Standards Buckling Under American's Ever Increasing Weight Gain
- Expert Opinion: Auger Conveyor Design Defect Amputates Employees Arm
- Expert Witnesses: Developing Effective Speaking Skills for Trial/Deposition Work
- At the Round Table With Mechanical Engineering Expert, David Smith
- Analysis of Belly Dump Trailer Failure
- Risk Assessment – The Often Forgotten Step in the Product Development Process
- The Case Within the Case – The Importance of Claim Construction in Patent Litigation
- Patent Expert Witness – Part of the Team or Puppet at Trial?
- Doubling Up – Two Fall Protection Standards Make it On OSHA's Top 10 List
- Know Before you Tow: Essential Safety Checks When Hooking Up Your Trailer
- The 7 Sins of Expert Witness Work



Case	Supported	Court	Number	Date	Type
Trebro v Firefly	Defendant	District Court for the District of Montana Billings Division	13-36-BLG-RFC	2014	Patent
Huffaker v Access RV et al.	Plaintiff	Third Judicial Court in and for Salt Lake County, State of Utah	150900684	2016	Personal Injury
Entro v HSI	Plaintiff	District Court for the Southern District of Texas Houston Division	4:16-cv-01153	2017	Patent
Entro v HSI	Plaintiff	District Court for the Southern District of Texas Houston Division	4:16-cv-01153	2017	Patent
Hoist v TuffStuff/ Certain Strength Training Equipment and Components Thereof	Defendant	DISTRICT COURT FOR THE CENTRAL DISTRICT OF CALIFORNIA Western Division - Los Angeles / International Trade Commission, Washington, D.C.	5:17-cv-01388-AB-KK / Inv. No. 337-TA-1135	2019	Patent
Hoist v TuffStuff/ Certain Strength Training Equipment and Components Thereof	Defendant	DISTRICT COURT FOR THE CENTRAL DISTRICT OF CALIFORNIA Western Division - Los Angeles / International Trade Commission, Washington, D.C.	5:17-cv-01388-AB-KK / Inv. No. 337-TA-1135	2019	Patent
Bartley v Sullair	Plaintiff	In The Superior Court of Troup County State of Georgia	18-CV-0079	2019	Personal Injury
Floodbreak, LLC v Art Metal Industries, LLC and Kevin F. Biebel	Defendant	United States District Court For the District of Connecticut	3:18-cv-00503 (SRU)	2019	Patent
Certain Collapsible and Portable Furniture	Plaintiff	International Trade Commission	337-TA-1178	2020	Patent
Rafferty Case	Plaintiff	Superior Court of the State of California County of Stanislaus	No. 90000526	2020	Personal Injury
*Certain Collapsible and Portable Furniture	Plaintiff	International Trade Commission	337-TA-1178	2021	Patent
Hale, Blake v Central Triangle Equipment	Plaintiff	In the Circuit Court of the Fifth Judicial Circuit, in and for Lake County, Florida	2019-CA-000579-AX	2021	Personal Injury
*Bartley v Sullair	Plaintiff	In The Superior Court of Troup County State of Georgia	18-CV-0079	2022	Personal Injury



Zapata v Republic Services, Inc.	Plaintiff	Benchmark Case No. 222671	BMA Case No. 222671	2022	Personal Injury
Certain Wet Dry Surface Cleaning Devices	Defendant	United States International Trade Commission, Washington, D.C.	Inv. No. 337-TA-1304	2022	Patent
Jeffery Helser v J. F. Brennan Company	Plaintiff	In the Circuit Court of La Crosse County State of Wisconsin	21-CV-206	2022	Personal Injury
Garcia v MSA	Defendant	United States District Court for the District of Arizona	2:19-cv-05789-SMB	2022	Personal Injury
*Certain Wet Dry Surface Cleaning Devices	Defendant	United States International Trade Commission, Washington, D.C.	Inv. No. 337-TA-1304	2022	Patent
Garcia v MSA	Defendant	United States District Court for the District of Arizona	2:19-cv-05789-SMB	2023	Personal Injury
Noble Security v ACCO Brands	Plaintiff	United States District Court for the Southern District of New York	1:16-cv-09129-PGG-GWG	2023	Patent
Affinity Tool Works, LLC v. Hangzhou Great Start Industrial Co.	Defendant	United States District Court Western District of North Carolina Charlotte Division	3:21-cv-575	2023	Patent
Christy Sahlstrom v The Greenery Nursery	Plaintiff	Superior Court of California, County of Stanislaus	CV-22-000569	2023	Personal Injury
Kiera Hynes v Buck Institute	Plaintiff	Superior Court of California, County of Marin	CIV 1802570	2023	Personal Injury
Apparatus and Systems for Air Borne Cleaning of Surfaces	Plaintiff	United States District Court for the Western District of Texas Austin Division	1:22-cv-00860-ADA	2024	Patent
Macy v Ray Lovato Recycling Center	Plaintiff	District Court for the Third Judicial District in and for Sweetwater County, State of Wyoming	CV-20-171-L	2024	Personal Injury
Trevor Horlacher v Heavy Equipment Solutions LLC	Plaintiff	Fourth Judicial District Court in and for Utah County, State of Utah	Case No. 220400273	2024	Personal Injury



Jody Tripp v Johnston's Port 33 et al.	Plaintiff	District Court in and for Muskogee County State of Oklahoma	Case No. CJ-2021-153	2024	Personal Injury
StormSeal v Structural Wrap	Defendant	United States District Court for the Southern District of Florida	Case No. 9:22-cv-81726	2024	Patent
Larada v PHS et al	Defendant	United States District Court for the District of Utah Central Division	Civil Action No. 2:18-cv-00551-RJS-PMW	2024	Trade Secret
April Lafever v Toyota Material Handling, U.S.A., Inc. et al.	Plaintiff	Circuit Court of Cook County, Illinois County Department Law Division	No. 21 L 007107	2024	Personal Injury
April Lafever v Toyota Material Handling, U.S.A., Inc. et al.	Plaintiff	Circuit Court of Cook County, Illinois County Department Law Division	No. 21 L 007107	2024	Personal Injury
*Larada v PHS et al	Defendant	United States District Court for the District of Utah Central Division	Civil Action No. 2:18-cv-00551-RJS-PMW	2024	Trade Secret
SeaCast Arlington v Blue Origin	Plaintiff	Superior Court of the State of Washington King County	No. 23-2-22090-1 KNT	2024	Product
Nayda Namous v Molson Coors Beverage Company	Plaintiff	In the state court for the county of Gwinnett State of Georgia	No. 22-c-04599-s2	2025	Personal Injury
Luepold & Stevens v Primary Arms	Plaintiff	In the United States District Court for the Southern District of Texas Houston Division	No. 4:24-cv-2025	2025	Patent
*Jan Bothma v State of South Dakota	Defendant	In Circuit Court, Sixth Judicial District, State of South Dakota, County of Lyman	No. 42CRI24-000022	2025	Personal Injury

* Indicates trial testimony

