

IN THE 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
Issue Date: October 10, 2023

Title: Aggregate Transferring System

**PATENT OWNER'S RESPONSE
UNDER 37 C.F.R. § 42.120**

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EXHIBIT LIST

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2001	U.S. Patent No. 8,926,252 to McIver et al. as Annotated During March 26, 2025 Deposition of Dr. Robert Durham
2002	Figures 6 and 7 of U.S. Patent No. 9,663,303 to Waldner et al. as Annotated During March 26, 2025 Deposition of Dr. Robert Durham
2003	Transcript of March 26, 2025 Deposition of Dr. Robert Durham
2004	Expert Declaration of Travis A. Anderson (dated April 28, 2025)
2005	Declaration of Dan Brinkman (dated April 17, 2025)
2006	Declaration of Mike Stanton (dated April 27, 2025)
2007	Declaration of Aaron Shatto (dated April 8, 2025)
2008	Solaris Oilfield Infrastructure Investor Presentation September 2021 (retrieved at https://ir.solarisoilfield.com/~media/Files/S/Solaris-IR/reports-and-presentations/soi-investor-presentation-2021-09-15.pdf)
2009	https://web.archive.org/web/20211130155708/https://www.solarisoilfield.com/products
2010	https://web.archive.org/web/20211130143508/https://www.solarisoilfield.com/products/top-fill-sand-loading-system
2011	Solaris Oilfield Infrastructure Investor Presentation December 2021 (retrieved at https://ir.solarisoilfield.com/~media/Files/S/Solaris-IR/reports-and-presentations/soi-investor-presentation-dec-2021-for-website.pdf)
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2017	Audio Recording of Q1 2023 Solaris Oilfield Infrastructure, Inc. Earnings Conference Call (retrieved at https://seekingalpha.com/article/4599091-solaris-oilfield-infrastructure-inc-soi-q1-2023-earnings-call-transcript)
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2022	Audio Recording of Q2 2024 Solaris Oilfield Infrastructure, Inc. Earnings Conference Call (retrieved at https://seekingalpha.com/article/4713146-solaris-oilfield-infrastructure-inc-soi-q2-2024-earnings-call-transcript)
2023	Audio Recording of Q3 2024 Solaris Oilfield Infrastructure, Inc. Earnings Conference Call (retrieved at https://seekingalpha.com/article/4733377-solaris-oilfield-infrastructure-inc-soi-q3-2024-earnings-call-transcript)

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2024	Audio Recording of Q4 2024 Solaris Energy Infrastructure, Inc. Earnings Conference Call (retrieved at https://seekingalpha.com/article/4760799-solaris-energy-infrastructure-inc-sei-q4-2024-earnings-call-transcript)
2025	Screenshot from Solaris Top Fill Sand Loading System Animation at https://vimeo.com/673402149 at 0:01
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2037	Amended Complaint and Jury Demand, <i>Masaba, Inc. v. Solaris Oilfield Site Services Operating, LLC</i> , Civil Action 2:23-CV-00236 (D. Wyo. June 14, 2024)

I. Introduction

Patent Owner Masaba, Inc. (“Masaba”) hereby submits this Patent Owner Response in Case No. IPR2024-01179 involving *inter partes* review of claims 1-25 of U.S. Patent No. 11,780,689 (“the ’689 Patent”).

Petitioner Solaris asserts unpatentability based on eight grounds, i.e., Grounds 1, 1A, 2, 2A, 3, 3A, 4, and 4A. In its Institution Decision, the Board concluded that Solaris satisfied the standard for institution for the claims associated with Ground 1. (Paper 7, pp. 7-9.) But the Board did not offer any conclusions regarding the other Grounds nor regarding the other claims. (Paper 7, p. 9.) Instead, the Board left those challenges “for trial after full development of the record.” (Paper 7, p. 9.) But even for the claims that the Board *did* address in its Institution Decision, “there is a significant difference between a petitioner’s burden to establish a ‘reasonable likelihood of success’ at institution, and actually proving invalidity by a preponderance of the evidence at trial.” *Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016).

This Response demonstrates that Solaris cannot ultimately prevail under the burden that applies at trial for any of the claims. With this Response, Patent Owner provides the deposition testimony of Solaris’s expert (Ex. 2003), the Expert Declaration of Travis A. Anderson (Ex. 2004), and the Declarations of Dan Brinkman (Ex. 2005), Mike Stanton (Ex. 2006), and Aaron Shatto (Ex. 2007), along

with Solaris's own words to its investors and to others (Exs. 2008-2031), all of which refute Solaris's assertions in this proceeding.

The evidence demonstrates that Solaris engaged Masaba to design a system to transfer "frac sand" to the top of Solaris's storage silos at oil field sites. As Masaba engineers worked to meet Solaris's requirements, Solaris expressed how important the solution would be to its business, expressed skepticism about components that Masaba eventually used to solve the problem, and praised Masaba's solution, stating that there was "no one" else "that could have designed it." Yet, despite Solaris's repeated statements that it would purchase several units, Solaris took delivery of only one unit and then made dozens of copies of it, all while informing its investors that those units were the driving force behind amazing increases in Solaris's financial performance.

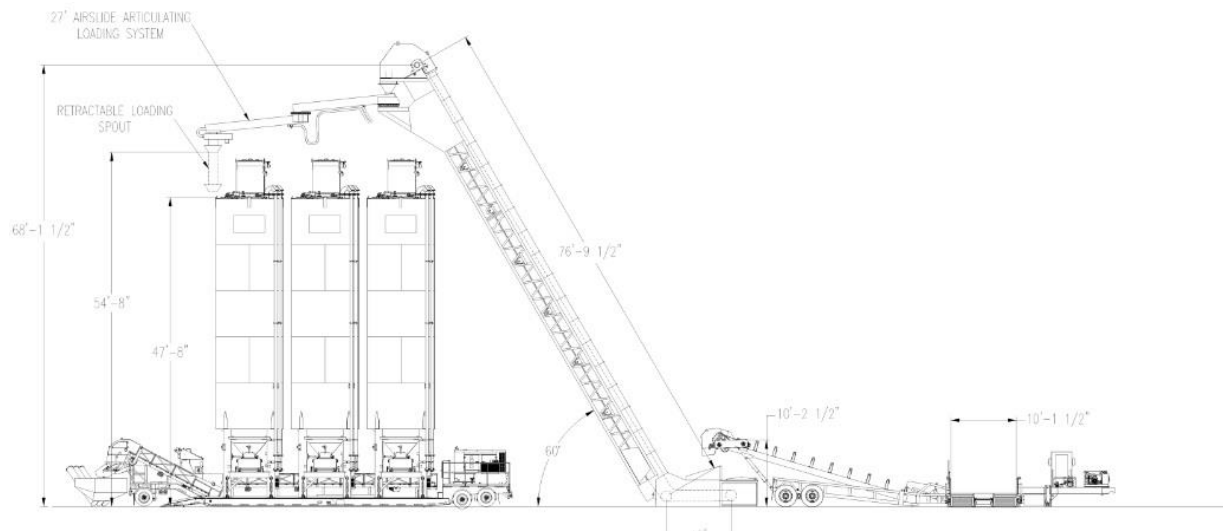
Now, Solaris wants the Board to believe that the same invention that it commissioned Masaba to invent—and that it has praised, copied, and profited from—was obvious all along. Indeed, Solaris has gone so far as to apply for its own patent on Masaba's invention, wrongfully attributing Masaba's invention to its own personnel and asserting that the same subject matter that Solaris now claims as "obvious" in Masaba's patent is patentable in Solaris's patent. Solaris's theories of obviousness not only do not jive with the real-world evidence, but they are also

unsupported and fatally flawed as a technical matter. Solaris has not met its burden to prove obviousness.

II. The Development and Success of Masaba's Invention

The history of Masaba's invention began in mid-2020, when Mike Stanton was exploring potential projects with Solaris. (Ex. 2006, ¶2.) Solaris told Stanton that it needed a faster way to fill its mobile frac sand silos installed at oil field sites. (*Id.*) Specifically, Solaris required that the solution be portable on public roads, have a minimal footprint, and transfer sand from belly dump trucks at a faster rate than Solaris's then-current method of using pneumatic trucks and pneumatic pipes. (*Id.*; Ex. 2005, ¶2.) Stanton recruited Masaba to design a solution. (Ex. 2006, ¶2; Ex. 2005, ¶2.)

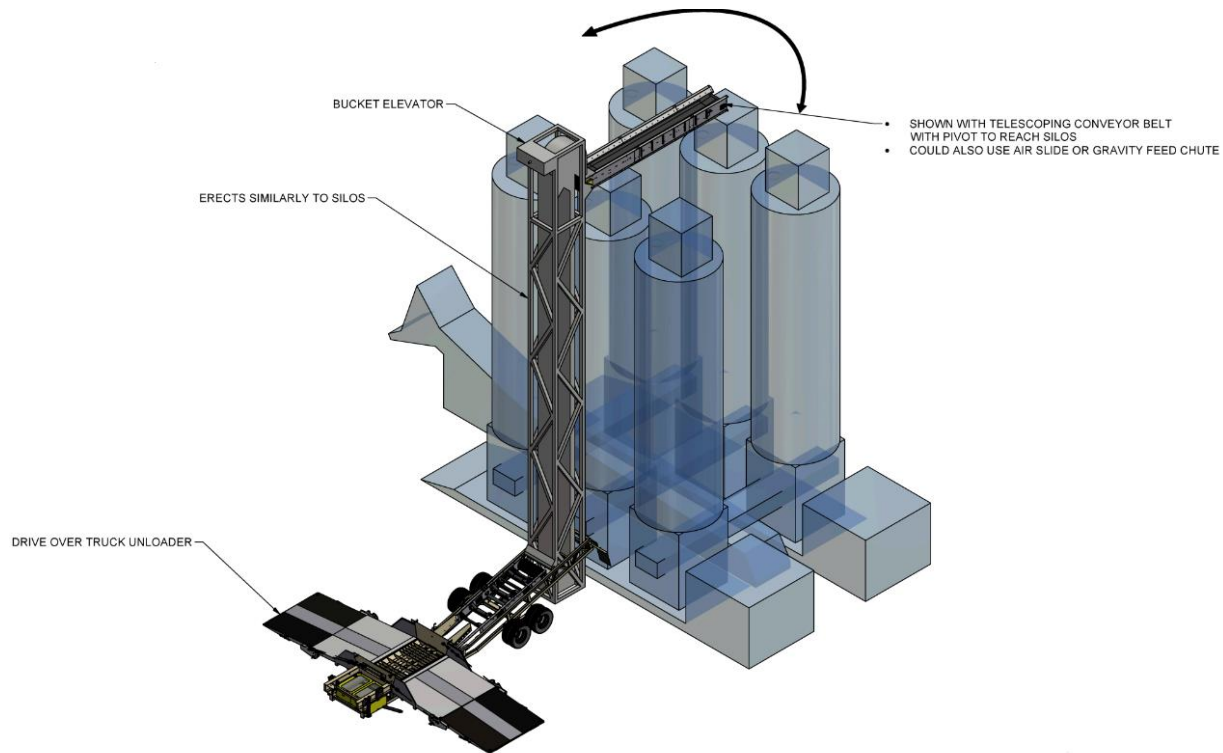
The conventional thinking was that the solution would require a high-capacity belt conveyor to obtain the desired material flow rates and a high incline angle to minimize the system's footprint. (Ex. 2006, ¶3; Ex. 2005, ¶4.) Masaba generated an initial concept with a truck unloader unit feeding a 76⁺-foot belt conveyor at a 60-degree angle, in turn feeding a 27-foot articulating airslide (an air-powered tube). (Ex. 2006, ¶3; Ex. 2005, ¶¶4-5.) Below is Masaba's initial concept drawing:



(Ex. 2005, ¶4.) At the time, Masaba engineers thought that an airslide at the top was preferable because it was lightweight and would best prevent dust. (Ex. 2005, ¶5.) The concept did not yet reflect a mechanism for making the system road-portable. (*Id.*) Significantly, the concept did **not** include an articulated belt conveyor at the top.

Solaris decided to move forward. (Ex. 2005, ¶6; Ex. 2006, ¶3.) In November 2020, Solaris engineer, Jeremy Weinstein, told Stanton that this was Solaris's most important project and that Solaris needed the solution to gain back market share. (Ex. 2006, ¶4 & Appx. A.)

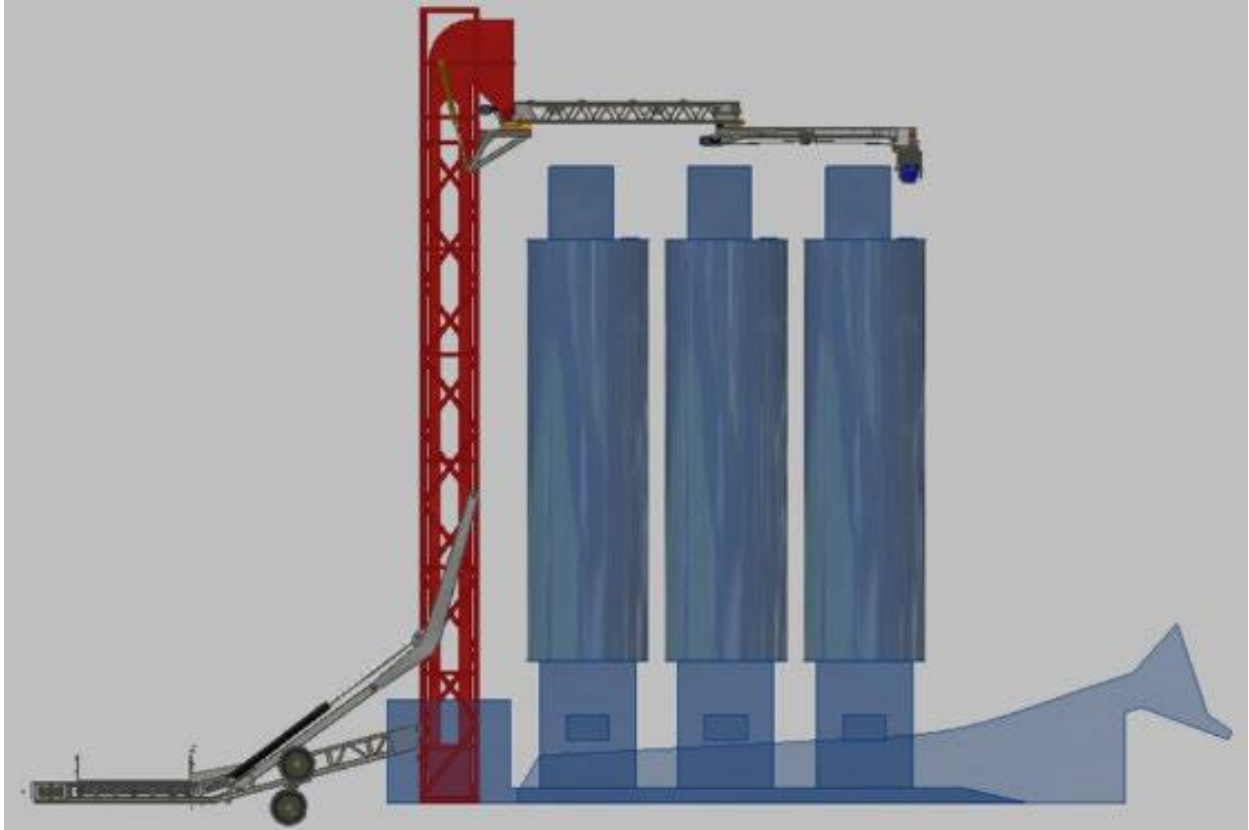
By January 2021, Masaba had come up with an iteration in which the airslide was replaced with a gravity-fed tube-in-tube extending chute:



(Ex. 2005, ¶9.) Solaris pushed back, explaining that “bucket elevators do not have a good reputation in the oil field,” and asked Masaba to continue working on increasing the belt conveyor’s incline even if it meant a reduced flow rate. (Ex. 2006, ¶6 & Appx. B; Ex. 2005, ¶10.) But eventually, Solaris became convinced that the bucket elevator design should be pursued. (Ex. 2005, ¶11; Ex. 2006, ¶7.)

When pursuing the bucket elevator design, Masaba engineers were aware of the *Dynatek* articulated belt conveyor now relied on by Solaris in this proceeding, but believed (and still believe) it would not work with the bucket elevator because it was not long enough, was too heavy even at its too-short length, had too high a profile for the overall system to be road-portable, and had dust control issues. (Ex. 2005, ¶12.) Instead, Masaba first pursued using a telescoping belt conveyor, only to

conclude that it would not fold down sufficiently for the system to be road-portable. (*Id.*) Masaba next focused on using an airslide. (*Id.*) However, it would have required a bucket elevator height that would have made road portability difficult. (*Id.*) Only then did the Masaba inventors conceive of using an articulated belt conveyor with inner and outer segments implemented as slider-bed belt conveyors. (*Id.*) Slider-bed belt conveyors use a conveyor belt sliding on a plastic-coated steel pan without any idler rollers, so they are lighter and have a lower height profile than conventional belt conveyors (such as the belt conveyors used in *Dynatek*). (*Id.*) Masaba's concept is shown in the diagram below. As can be seen, the inner conveyor is designed to have a stronger frame than the outer conveyor, but both arms are lower profiled and lighter than the arms of the conventional belt conveyors in *Dynatek*:



(Ex. 2005, ¶12.) After Masaba presented this concept, Solaris agreed to purchase one unit. (Ex. 2005, ¶13; Ex. 2006, ¶7.) As engineering progressed, Solaris communicated concerns about the potential for the articulated belt conveyors to mistrack. (Ex. 2005, ¶14.) Belt mistracking occurs when a belt conveyor is not level side-to-side. (*Id.*; Ex. 2004, ¶55.) When the left side of a belt conveyor is not at the same height as its right side, the conveyor belt will move, or “track,” from the high side to the low side. (*Id.*) When a conveyor belt “mistracks,” it can result in damage to the belt, damage to the components that the belt runs up against, and/or material spillage. (*Id.*) Masaba addressed the mistracking issue with several features, including features ensuring that the bucket elevator would be vertically plumb and

that the belt conveyors would extend outward at a 90-degree angle to it. (Ex. 2005, ¶14; Ex. 2004, ¶¶63-65.)

As the project progressed, Solaris representatives told Masaba that they were very excited about the design, that Solaris expected it to change its business and even the industry, and that Solaris would be purchasing several more units in the future. (Ex. 2005, ¶15; Ex. 2006, ¶8.) Solaris even issued a purchase order for a second unit. (*Id.*)

By late July 2021, Masaba had built a first unit and scheduled testing on it over the course of several days. (Ex. 2005, ¶16; Ex. 2006, ¶9.) The testing was performed at Masaba's facility and then at a nearby gravel pit using Solaris silos. (*Id.*) Solaris representatives attended the testing. (*Id.*) The following photographs show Masaba's first unit at that time:





(Ex. 2005, ¶17.) And the following photographs show the Masaba first unit at the gravel pit, alongside Solaris silos:





(Ex. 2005, ¶¶18-19.)

The Solaris representatives were very impressed by Masaba's invention and excited by the test results. (Ex. 2006, ¶9.) Solaris's engineer praised the design and

said that “there was no one that he was aware of that could have designed it.” (*Id.* & Appx. C.) Just a few weeks later in Solaris’s September 2021 investor presentation, Solaris referred to the Masaba design as Solaris’s “Top Fill system” and touted its “[b]elly [d]ump capability” (*i.e.*, the capability of accepting frac sand from belly dump trucks and not being limited to pneumatic trucks) as an “Innovation.”¹ (Ex. 2008, pp. 5, 8.) The presentation featured a photograph of the Masaba unit at the gravel pit testing site. (*Compare* Ex. 2008, p. 9 with Ex. 2005, ¶19.)

Masaba continued working on, testing, and fine tuning the first unit and delivered it to Solaris in October 2021. (Ex. 2005, ¶21; Ex. 2006, ¶11.) Masaba sold the first unit at a loss of hundreds of thousands of dollars due to the extensive and unanticipated engineering and design work involved but took the loss because Solaris had repeatedly stated it would purchase many more units. (Ex. 2005, ¶22.) However, the parties failed to reach an agreement regarding the sale price of the second unit, and, consequently, Masaba stopped work on the second unit. (*Id.*, ¶23.)

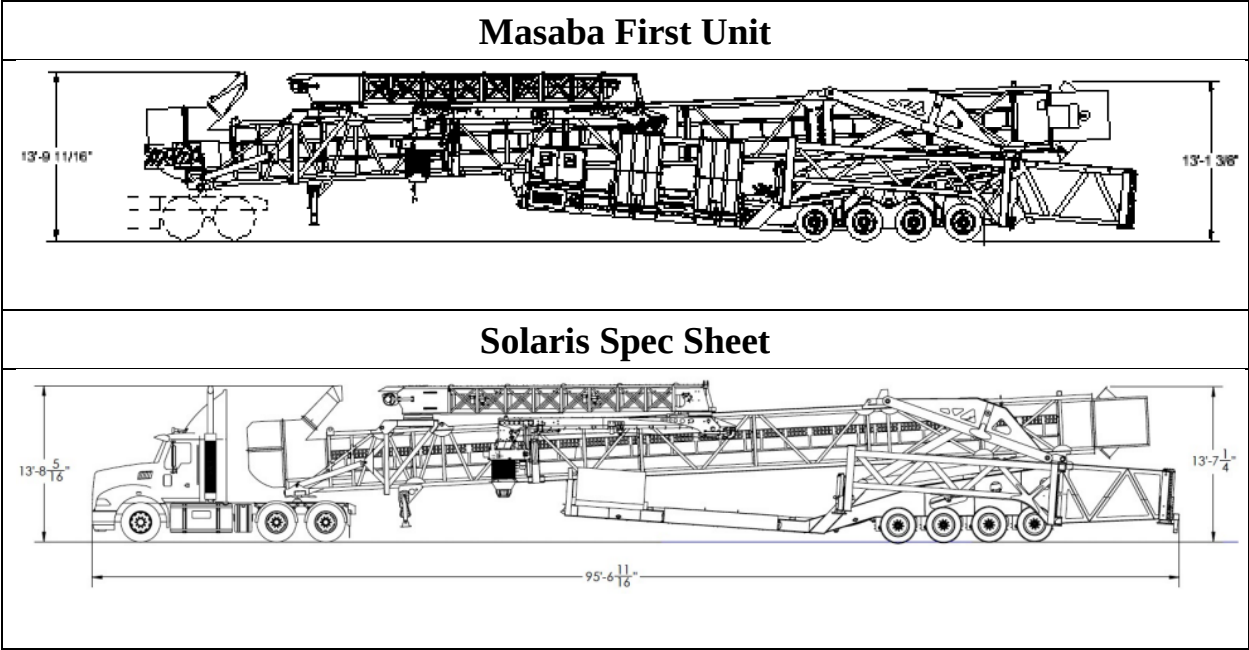
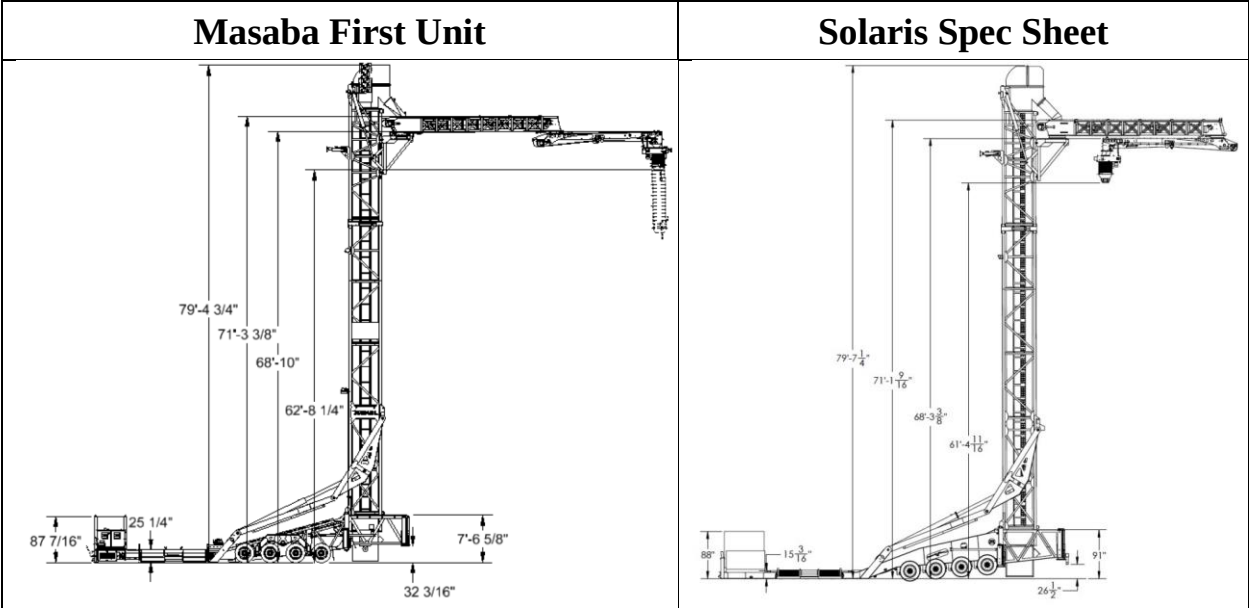
Instead of purchasing additional units from Masaba, Solaris started making copies of Masaba’s first unit—even though Solaris was aware that Masaba had applied for a patent. (Ex. 2005, ¶¶20, 24; Ex. 2006, ¶10.) By November 2021, Solaris was advertising the “Top Fill Sand Loading System” on its website. (Ex. 2009; Ex.

¹ Belly dump trucks can unload in approximately one-quarter the time of a pneumatic truck. (Ex. 2029, p. 2; Ex. 2030, p. 14.)

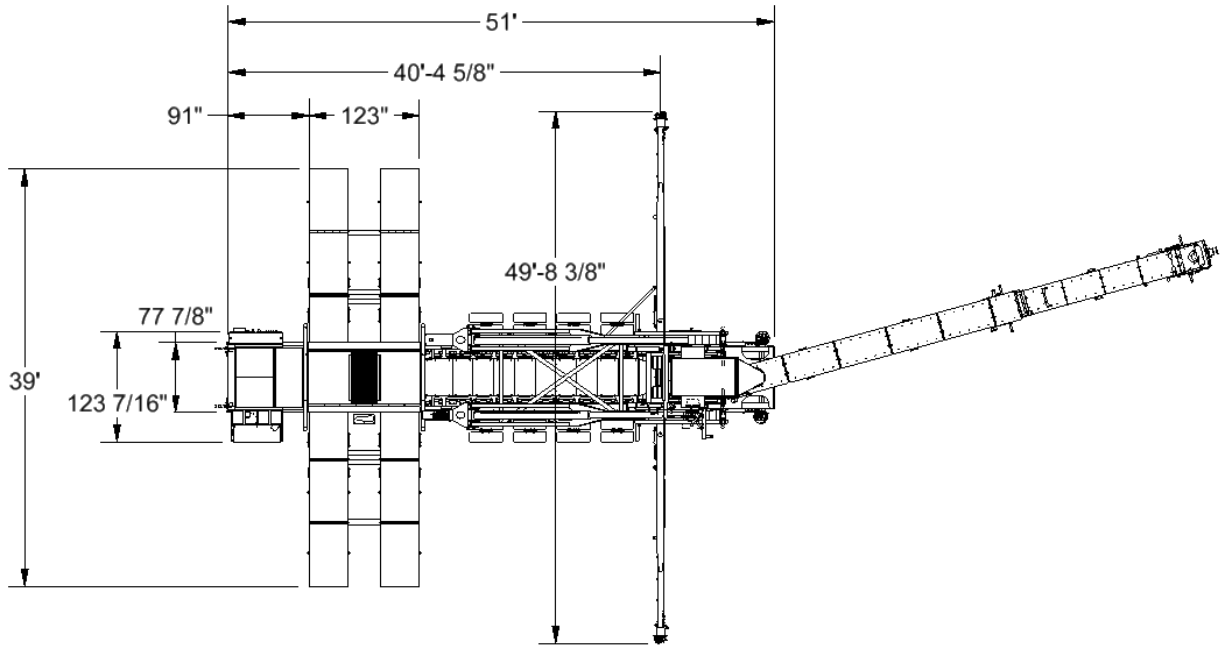
2010.) In its December 2021 investor presentation, Solaris again used a photograph of Masaba’s first unit (*compare* Ex. 2011, p. 4 *with* Ex. 2005, ¶19) and touted it as one of Solaris’s “[i]nnovative products & [s]olutions.” (Ex. 2011, p. 4.)

In its Q4 2021 earnings call, Solaris told its investors that it now had two Top Fill systems, touting improved profit: “[W]e were able to use our Top Fill technology to optimize trucking, which contributed to improved profit per system.” (Ex. 2012, 2:36-3:08.) Solaris further reported: “We have strong demand signals from both existing and new customers for Top Fill systems and as such we will be growing our Top Fill suite significantly in 2022.” (Ex. 2012, 6:05-6:31.) Solaris explained that “on an incremental basis, the addition of the Top Fill system will bring us additional profitability per system” and “significant incremental growth.” (Ex. 2012, 20:21-20:48.)

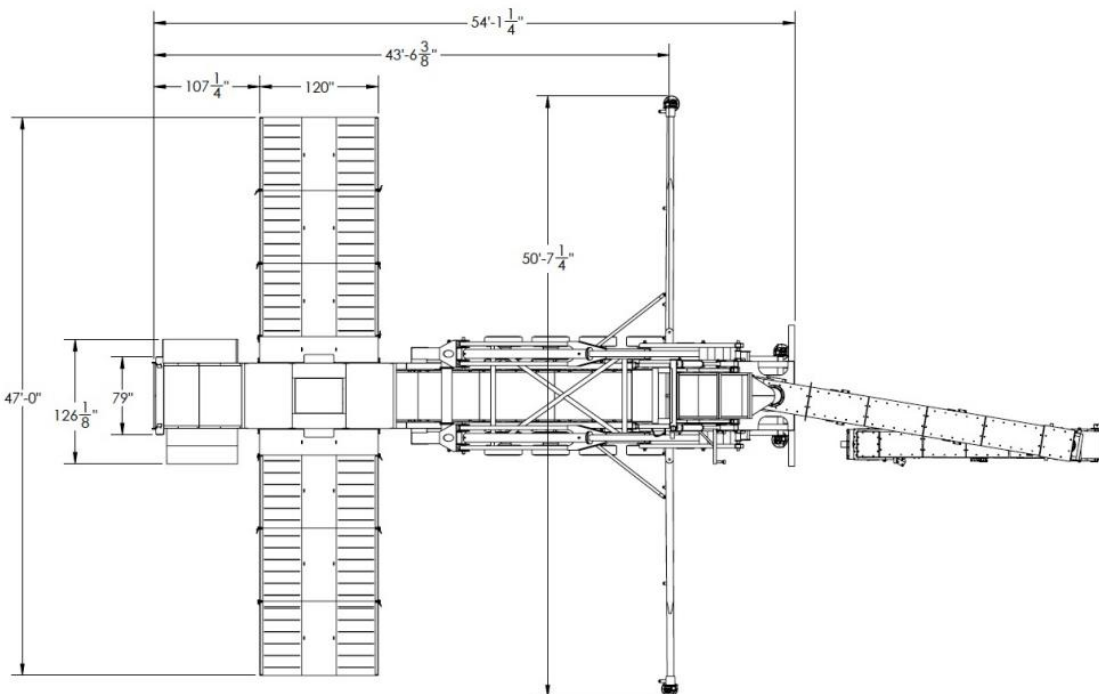
In February 2022, Solaris released an animation of the Top Fill System and in June 2022 a spec sheet for the Top Fill system, making clear that it is a copy of the Masaba unit delivered to Solaris. (Exs. 2025-2029.) Indeed, the spec sheet shows dimensions for Solaris’s Top Fill system that are within inches of the dimensions of Masaba’s first unit. Below are figures comparing the two and their dimensions:



Masaba First Unit



Solaris Spec Sheet



(Ex. 2005, ¶24.)

In later reports to its investors, Solaris continued to describe how it was rapidly making additional Top Fill systems, so that by the end of 2023, Solaris reported having about 60 Top Fill systems. (Ex. 2014, 13:32-13:45 (2 in Q2 2022); Ex. 2015, 5:12-5:33 (9 in Q3 2022); Ex. 2016, 2:16-2:26 (30 in Q4 2022); Ex. 2017, 12:44-13:01 (40 in Q1 2023); Ex. 2019, 2:43-3:15, 17:16-17:41 (53 in Q3 2023); Ex. 2020, 19:46-19:53 (55-60 in Q4 2023).

Solaris made so many Top Fill systems so quickly (and reported the number to its investors) because they were driving amazing financial performance. Below are just a few of Solaris's comments to its investors in earnings calls about the financial success attributable to the Top Fill systems:

- Q1 2022: “During the [first] quarter, ...[w]e also worked for 10% more oil and gas operators than we worked for in the fourth quarter. ***Some of this new customer growth was a direct result of demand from our new technology offerings such as our Top Fill system....*** Our Top Fill design offers flexibility and reliability...by using either higher payload belly dump truck trailers or traditional pneumatic trailers. ***...This added value helped drive our first quarter results***, where we had ***higher profitability per ton and per frac crew....***The improved last mile profitability...was driven by a higher number of tons delivered by belly dump trucks and an improved job mix, ***which we secured due to our investment in our Top Fill solutions.... Demand for our***

Top Fill solution continues to exceed current availability....” (Ex. 2013, 2:24-4:20.)

- Q2 2022: *“Nearly every customer that has a Top Fill today has indicated plans to continue to use the system. And in many cases, some of our Top Fills have allowed us to add incremental silo work for new customers in addition to their current system activity....[W]e have a growing backlog and demand for the units.... As we’ve rolled out the Top Fill equipment, we have used them in many of our integrated last mile jobs and have been able to further enhance our margins.” (Ex. 2014, 4:20-6:32.)*
- Q3 2022: *“During the third quarter, approximately half of our net growth in total systems deployed was pull through share, driven by delivery of additional Top Fill units.” (Ex. 2015, 3:30-5:58.) “...[W]ith the Top Fill unit, we’re able to hit a market that has traditionally not been using silos. ...[I]n many cases, somewhere between a third and a half, are actually pulling through new silos for new market.” (Id., 16:09-16:48.)*
- Q4 2022: *“Our most visible growth in 2022 came from our all new electric Top Fill based systems where we...have more than 30 operating in the field today.” (Ex. 2016, 2:16-2:25.) “We believe our Top Fill investment allowed us to grow faster than the underlying U.S. frac market and grow our footprint in historically underrepresented basins like the Rockies.” (Id., 4:25-*

4:35.) “During the quarter, ***we realized strong incremental margin contribution from additional Top Fills.***” (*Id.*, 10:47-11:05.) “[W]e are very excited about the immediate opportunity in front of us to continue to grow ***our Top Fill units, which will drive incremental share and cash flow.***” (*Id.*, 12:57-13:19.)

- Q1 2023: “***Our new Top Fill technology has made quite a meaningful impact in a very short period of time***, both to our customers and to Solaris. ***We launched this new offering just one year ago. And since then, we have grown from a couple of systems to over 40 in the field today. ...Our Top Fill system has allowed us to deliver increased value to a larger breadth of high-quality and active customers than in the past.***” (Ex. 2017, 3:01-4:03; *see also id.*, 17:23-17:58.)
- Q2 2023: “***Our Top Fill technology has been a major driver of the success.*** Today, we have nearly 50 units in the field compared to only a couple of units a year ago. ***...Our Top Fill units have become industry leading in a short period....***” (Ex. 2018, 3:38-4:19.)
- Q3 2023: “Turning to the third quarter highlights, we maintained flat activity...***as the drop in frac crews we followed was offset by the deployment of our Top Fill systems. Our fully utilized Top Fill systems increased by six systems to 33, a year-over-year increase of more than 250%.***” (Ex. 2019, 2:44-

3:15.) *“Our Top Fill design has established Solaris as the largest provider of belly dump compatible wellsite sand storage in the Lower 48. Using our Top Fill system, our customers benefit from higher truck payloads and faster unloading times, resulting in fewer trucks and drivers needed to supply well sites and ultimately lower costs.”* (Id., 5:00-5:20.) “On a per-frac-crew-followed basis, our contribution margin...*has grown over 40% year-over-year....* We believe that *our per-frac-crew profitability should benefit from additional deployments of Top Fill systems moving forward....*” (Id., 9:26-9:57.)

- Q3 2024: “[W]e continue to generate free cash flow and maintain multiple Solaris systems on over 60% of our customer locations during the quarter, *primarily driven by the continued success of our Top Fill product.*” (Ex. 2023, 2:41-2:58.) “[W]e maintained multiple systems on over 60% of those locations. That 60% is also double where we were in early 2023, *highlighting the success of our strategic investment in building and deploying a fleet of Top Fill equipment that drives efficiencies for our customers as well as increased earnings opportunities per location for Solaris.*” (Id., 7:51-8:37.)
- Q4 2024: “[A]pproximately 70% of our locations had both our legacy sand system and a Top Fill system. Going into the first quarter, we expect closer to

75% of our sites to have multiple Solaris systems, *and we're effectively sold out of our Top Fill solution.*" (Ex. 2024, 9:14-9:51.)

The Top Fill system was so valuable that, in May 2023, Solaris filed a patent application describing the very system that Masaba had delivered in October 2021 and claiming patentability for the very system that Solaris now says would have been obvious. (Ex. 2031, Figs. 1, 3-9, claim 6.) The named "inventors" include Solaris personnel knowledgeable about Masaba's invention, but Masaba's role was not disclosed to the USPTO. (Ex. 2031, p. 1; Ex. 2005, ¶¶3, 11, 15, 16; Ex. 2006, ¶¶2, 4, 6-10.) The fact that Solaris would stoop so low to obtain patent protection for the Top Fill system shows how valuable it is. Solaris's actions and the real-world facts speak louder than Solaris's words in this proceeding.

III. Dr. Durham Is Not Qualified to Testify and Has Incorrectly Identified the Qualifications of a POSITA to Shoehorn Himself as a POSITA/Expert

Not only do the real-world facts cut against Solaris's obviousness theories, but Solaris has failed to provide adequate support for those theories. Solaris proffers the expert testimony of Dr. Robert Durham, but "to be qualified to offer expert testimony on issues from the vantage point of an ordinarily skilled artisan in a patent case, an expert must at a minimum possess ordinary skill in the art." *Kyocera Senco Ind. Tools, Inc. v. Int'l Trade Comm'n*, 22 F.4th 1369, 1376-77 (Fed. Cir. 2022). Dr.

Durham does not possess that minimum skill level for the '689 Patent. Therefore, the Board should give his testimony no weight.

The '689 Patent is entitled "Aggregate Transferring System." (Ex. 1001, p. 1.) Its claims are directed to "an aggregate transferring apparatus for elevating and transferring aggregate." (Ex. 1001, pp. 30-34.) Even Dr. Durham acknowledges that the field of the '689 Patent is "aggregate handling systems." (Ex. 2003, 45:11-13.) But Dr. Durham's undergraduate degree is in **electrical** engineering. (Ex. 1003, ¶5.) And figuring out how to convey aggregate materials from one location to another is obviously not an **electrical** engineering problem. (Ex. 2004, ¶28.) Tellingly, the two inventors of the '689 Patent are both **mechanical** engineers. (Ex. 2005, ¶3.)

Dr. Durham's other degrees also do not qualify him to testify here. He has a Master's degree in "Technology Management" and a Ph.D. in "Engineering Management." (Ex. 1003, ¶5.) At his deposition, Dr. Durham could identify nothing associated with those degrees that addressed the engineering challenges associated with conveying aggregate materials. (Ex. 2003, 7:23-8:25, 9:5-12.)

Nor does Dr. Durham's experience qualify him. His declaration explains that he has been working in the "oil & gas industry" for many years but shows that he has not been engineering aggregate transferring systems in any capacity. Instead, he has been working in "the electrification of the oil and gas industry," "in the area of electrical equipment in the oil and gas industry," "in the area of electrification of oil

and gas fields” (including “overhead power lines, transformers, switchgear, drives, and motors”), “the design, construction, and analysis of all kinds of power systems,” “interfacing with drilling and fracturing operations with regards to electrical needs,” and “power distribution, including generation, transmission, and distribution equipment.” (Ex. 1003, ¶¶4, 7-9, 11-12). At his deposition, the *only* direct engineering experience that he could point to involving aggregate transfer systems was a four- or five-month project more than 25 years ago designing controls for a system that conveyed coal into a silo. (Ex. 2003, 9:15-11:3, 17:5-12, 17:22-19:14.) But he was not involved in the design, construction, or selection of that system’s structural or mechanical components. (*Id.*, 17:13-21.)

Dr. Durham and Solaris attempt to fit the square peg of Dr. Durham’s expertise into the round hole of the subject matter of the ’689 Patent by claiming that a POSITA “would have a degree in mechanical, **electrical**, petroleum, or civil engineering with at least two years’ of experience working in ***an industry or field that involves*** handing [sic, handling] of particulate materials....” (Ex. 1003, ¶41; Paper 1, p. 14.) As noted above, figuring out how to convey aggregate materials is not an **electrical** engineering problem. (Ex. 2004, ¶28.) And merely “working ***in an industry or field that involves*** [handling] of particulate materials” is very different from ***doing work that involves*** the handling of aggregate materials. Indeed, at his deposition, Dr. Durham conceded that his proposed definition would include

someone working in the oil & gas industry “with no experience or interaction with conveyor systems.” (Ex. 2003, 28:12-23.) Dr. Durham’s definition of a POSITA is wrong and obviously crafted to encompass himself despite his lack of relevant knowledge and experience.

In contrast, Masaba’s expert, Travis Anderson, is a mechanical engineer who has worked for equipment manufacturers for more than forty years, with fifteen of those years on teams specifically designing, constructing, and testing aggregate handling equipment for use in the oil & gas industry. (Ex. 2004, ¶¶3-16, 30.) Mr. Anderson, a qualified expert beyond dispute, testifies that a POSITA “would have a degree in mechanical or perhaps petroleum or civil engineering with at least two years of experience directly related to engineering equipment for conveying and storing aggregate material” and that “[a] POSITA with degrees in other engineering fields, like electrical engineering, would need approximately 4-6 years of hands-on experience specifically related to engineering aggregate handling equipment to be considered to have the ordinary level of knowledge and skill in this area.” (*Id.*, ¶¶17, 26-28.) Mr. Anderson further testifies that merely having general experience in industries, such as the oil & gas industry, where *the industry* involves the handling of aggregates, is insufficient to qualify *a person* as having an ordinary level of skill in the art of transferring aggregate. (*Id.*, ¶¶29, 32.)

When pressed at his deposition about how he obtained the expertise needed for this case, Dr. Durham testified that he has become an “expert” merely by “dealing with” and “observing” aggregate handling systems. (Ex. 2003, 46:25-47:6.) But the POSITA in this case is not merely “dealing with” or “observing” aggregate handling systems; the obviousness analysis asks whether it would have been obvious for a POSITA to **design** the claimed aggregate transferring system. Dr. Durham has absolutely no experience, let alone expertise, in that area. His four or five months of experience designing controls for a conveyor system 25 years ago certainly does not qualify him. Designing the controls of aggregate handling systems requires a different skill set than designing the structural and/or mechanical aspects of such systems. (Ex. 2004, ¶31.) Thus, Dr. Durham’s experience was of the wrong type—and was too brief in any event. (*Id.*, ¶¶31-32.) Dr. Durham’s lack of expertise will become apparent as his arguments are addressed specifically below and in Mr. Anderson’s declaration. Dr. Durham’s testimony should be given no weight.²

² Although not an expert in the technology of the ’689 Patent, Dr. Durham is an expert at being an expert witness, having served as an expert in “20 to 30” patent matters. (Ex. 2003, 141:11-23.) And this is not the first time that Dr. Durham has attempted to provide unreliable expert testimony. *See Trusty v. Sunbeam Products, Inc.*, 2014 WL 1410259 (W.D. Ark. Feb. 19, 2014) (excluding Dr. Durham’s testimony as unreliable).

IV. GROUND 1: Solaris Has Failed to Prove Obviousness of Claims 1-2, 4-11, 16-20, and 22-24 Based on *Waldner* and *Dynatek*

Solaris’s “Ground 1” attacks independent claims 1, 16, 18, 22, and 23 (and dependent claims 2, 4-11, 17, 19-21, and 24) using the combination of *Waldner* and *Dynatek*. (Paper 1, pp. 25-63.) Solaris’s main argument is that it would have been obvious “to substitute *Dynatek*’s EconoLoader for *Waldner*’s discharge chute.” (Paper 1, pp. 26, 44, 45-46; *see also* Paper 1, pp. 40-41.) That argument fails, and so does Solaris’s alternative argument that it would have been obvious to modify *Waldner*’s chute “by adding belt conveyors” to it. (Paper 1, pp. 27, 44; *see also* Paper 1, pp. 40-41.) Those arguments will be addressed below, first for claim 1 and then for the rest of the claims at issue in Ground 1. But because Solaris has attempted to muddy the water, it is first important to establish all the limitations of claim 1 that *Waldner* does not disclose.

A. Ground 1 Fails to Demonstrate Obviousness for Claim 1

1. *Waldner* Does Not Disclose “A Conveyor Extension Assembly for Conveying Aggregate” (Limitation 1[h]) or “An Extension Conveyor for Moving Aggregate” (Limitation 1[i])

Limitation 1[h] of claim 1 requires “a conveyor extension assembly for conveying aggregate to locations horizontally outward from the aggregate elevating assembly,” and limitation 1[i] requires “an extension conveyor for moving aggregate from an inlet of the extension conveyor to an outlet of the extension conveyor at a location outward from the aggregate elevating assembly.” (Ex. 1001, 16:49-52.) In

analyzing these limitations, Solaris first points to *Waldner*'s discharge chute 242. (Paper 1, pp. 39-40, 41-42.) But *Waldner*'s chute is not a "conveyor extension assembly for conveying aggregate" as limitation 1[h] requires and is certainly not "an extension conveyor for moving aggregate" as limitation 1[i] requires. (Ex. 2004, ¶33.) The words "conveying" and "moving" are transitive verbs, and "aggregate" is the direct object of those verbs. As Mr. Anderson testifies, a POSITA would understand this language to refer to "a device **that imparts motion** to the aggregate to transport it from one point to another." (*Id.*, ¶34.) In contrast, "a discharge chute is a **passive** device that does not impart motion to the aggregate" but instead "merely directs the flow of the aggregate." (*Id.*) With *Waldner*'s chute, "it is gravity that imparts motion to the aggregate, ...not the discharge chute." (*Id.*, ¶¶34-35.)

At his deposition, Dr. Durham confirmed it is "correct" that the term "conveyor for moving aggregate" refers to "devices that in some manner or another in part [sic: impart] movement to the particles." (Ex. 2003, 69:23-70:1; *see also* 68:19-69:4.) Dr. Durham further confirmed that a "fixed tube" or "a pipeline" would *not* qualify as a "conveyor for moving aggregate." (Ex. 2003, 69:14-15, 70:4-19.)

Like a "fixed tube" or "a pipeline," *Waldner*'s chute does not impart movement to the material that flows within it, is not a "conveyor extension assembly for conveying aggregate" as limitation 1[h] requires, and is certainly not "an extension conveyor for moving aggregate" as limitation 1[i] requires. (*See* Ex. 2004,

¶¶34-35.) Therefore, Dr. Durham’s declaration testimony that *Waldner* discloses those limitations (Ex. 1003, ¶¶147-151, 154-156) is flatly wrong.

2. *Waldner* Does Not Disclose an Extension Conveyor with an “Outboard Segment” That Is “Pivotally Connected” to an “Inboard Segment” by “An Outboard Pivot” (Limitation 1[j]) “About a Substantially Vertical Axis” (Limitation 1[k])

Solaris does not even attempt to argue that *Waldner* satisfies limitation 1[j] requiring an extension conveyor having an “outboard segment” that is “pivotally connected” to an “inboard segment” by “an outboard pivot.” (Paper 1, pp. 43-44.) Nor does Solaris argue that *Waldner* satisfies limitation 1[k] requiring the outboard segment to pivot “about a substantially vertical axis.” (Paper 1, pp. 45-46.)

3. It Would Not Have Been Obvious to Substitute *Dynatek*’s Belt Conveyor for *Waldner*’s Chute to Satisfy the Missing Claim 1 Limitations

Solaris’s primary argument is that it would have been obvious to substitute *Dynatek*’s belt conveyor for *Waldner*’s chute to satisfy the missing claim 1 limitations. That argument fails because, as explained below, (1) Solaris has failed to show that a POSITA would have had a motivation to do so and (2) even if there were a motivation, a POSITA would not have had a reasonable expectation of success.

a) Solaris Has Failed to Show Motivation to Substitute *Dynatek*’s Belt Conveyor for *Waldner*’s Chute

Relying on Dr. Durham’s testimony, Solaris argues that a POSITA would have been motivated to substitute *Dynatek*’s belt conveyor for *Waldner*’s chute “to

maximize the system’s range of motion and reach, optimize dust control, enhance mechanical control, and/or increase discharge rates.” (Paper 1, p. 26 (citing Ex. 1003, ¶¶117-118).)

There are several problems with these assertions. First, in the real world, the skepticism that Solaris expressed about bucket elevators—which Solaris attributed to the entire industry—would have steered a POSITA away from *Waldner* as a starting point in the first place, because *Waldner* uses a bucket elevator. Second, for the reasons explained below, none of the “motivations” proffered by Solaris withstands scrutiny. (Ex. 2004, ¶¶36-51.)³

With respect to “maximiz[ing] the system’s range of motion and reach,” Solaris’s argument *assumes*, without any supporting reasoning, that *Waldner*’s chute does not have sufficient “range of motion and reach.” *Waldner*’s chute is clearly designed to move left, right, up, and down, and to extend telescopically “to various positions in 3D space.” (Ex. 1004, 25:58-66; Ex. 2004, ¶¶41, 43.) Therefore, it has “range of motion and reach.” Without any reason why *Waldner* needs *more* “range of motion and reach,” Solaris has not identified a true, non-hindsight motivation. (*Id.*) At his deposition, Dr. Durham stated that *Waldner*’s chute has limited

³ Other potential “motivations” offered by Dr. Durham but not presented in Solaris’s petition should not be considered but also fail for the reasons provided by Mr. Anderson. (Ex. 2004, ¶¶36-40, 42.)

horizontal rotation, but he could not provide any reason why *Waldner*'s range of rotation was insufficient. (Ex. 2003, 77:19-78:19.) There is no need in *Waldner*, for example, to fill silos *behind* the bucket elevator. (Ex. 2004, ¶¶41, 43.) And even if a need *did* exist for greater "reach," 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). (*Id.*)

With respect to "optimiz[ing] dust control," Solaris relies on paragraph 118 of Dr. Durham's declaration. But at his deposition, he acknowledged that his declaration was based on the incorrect premise that *Waldner*'s chute was "open." (Ex. 2003, 95:6-13.) Dr. Durham later conceded that *Waldner*'s chute is "an enclosed tube." (Ex. 2003, 101:24-102:21; Ex. 1003, 25:7-13; *see also* Ex. 2003, 104:25-105:2.) Thus, no basis remains for Solaris's argument. In contrast, Mr. Anderson testifies that a POSITA would have known that an enclosed chute, like *Waldner*'s, provides superior dust control over a belt conveyor and why it does so. (Ex. 2004, ¶49.)

Solaris's next alleged "motivation" is "enhance[d] mechanical control." That nice-sounding phrase comes from Dr. Durham's declaration, but he never explains what it means. (Ex. 1003, ¶118.) If Solaris and Dr. Durham are referring to the number of control points, they are incorrect because, as Mr. Anderson testifies, the *Dynatek* conveyor system and *Waldner*'s chute provide an equal level of mechanical

control/precision. (Ex. 2004, ¶48.) Specifically, both have 3 points of control for navigating to a point in 3D space. (*Id.*; see also Ex. 1003, 25:7-13, 58-66.)

It may also be that “enhance[d] mechanical control” refers to “control” of the rate at which material can flow. If so, then it overlaps with Solaris’s last alleged “motivation,” i.e., “increas[ing] discharge rates.” These arguments are based on Dr. Durham’s testimony and demonstrate that he misunderstands the effect of the speed of *Dynatek*’s conveyor if it were substituted into *Waldner*’s system. (Ex. 2004, ¶44.) As Mr. Anderson testifies, systems such as *Waldner*’s are designed to hit a target transfer rate. (*Id.*) The material flow rate of the system, including the discharge rate, is set at the input or loading point; all downstream components must move the material at the same or greater flow rate than the input flow rate, i.e., the target transfer rate. (*Id.*) It is not possible to discharge material at a flow rate greater than this input flow rate. (*Id.*) A POSITA would recognize that *Waldner*’s chute would not be the limiting factor in the flow rate of *Waldner*’s system. (*Id.*) In other words, *Waldner*’s chute is not used to “control” the discharge flow rate; it is not capable of discharging material at flow rates greater than the input flow rate. (*Id.*) Because *Waldner*’s chute is not the limiting factor in the flow rate of *Waldner*’s system, a POSITA would not be motivated to replace it with something faster because a faster component would have no effect on the system’s overall flow rate. (*Id.*) That Dr. Durham failed to understand this concept exposes his lack of expertise in this field.

In addition, Dr. Durham's references to "the speed" of *Dynatek's* conveyor demonstrate his misunderstanding in another way. (See Ex. 1003, ¶¶115, 117, 118.) What matters is the mass or volume flow rate, not the "speed" of a conveyor. (Ex. 2004, ¶45.) In reality, a POSITA would want to *minimize* the "speed" of a conveyor while maintaining a flow rate capacity that is only slightly above the input flow rate, because higher belt speeds will result in more dust and shorter component life without increasing flow rate. (*Id.*)

Even if a POSITA were somehow motivated to "increase discharge rates" in *Waldner*, a POSITA would not look to *Dynatek* as a solution. Instead, a POSITA would merely increase the diameter of *Waldner's* chute. (Ex. 2004, ¶46.) A POSITA would understand that chutes like *Waldner's* can transfer material at flow rates greater than conveyors like *Dynatek's*. For example, *Dynatek* discloses that its maximum rate is 528 tons per hour. (Ex. 1005, p. 3.) A POSITA would know that a chute that can handle 600 tons per hour would be very common; chutes can easily handle even greater rates but rarely need to do so because the system's limiting factor is not the chute. (Ex. 2004, ¶46.) Moreover, a POSITA would realize that, for a given flow rate, chutes have fewer moving components (and thus are less prone to breakdown), are significantly smaller and lighter, and, consequently, require smaller and less complicated mounts and are easier to transport than *Dynatek's* conveyors. (*Id.*, ¶47.)

In summary, none of the alleged “motivations” to which Solaris points would have actually been a “motivation.” Solaris’s obviousness theory for claim 1 should therefore be rejected.

b) A POSITA Would Not Have Had a Reasonable Expectation of Success in Substituting *Dynatek*’s Belt Conveyor for *Waldner*’s Chute

Even if there were some motivation to “substitute *Dynatek*’s [belt conveyor] for *Waldner*’s discharge chute” (Paper 1, p. 26), Mr. Anderson’s testimony establishes that a POSITA would not have had a reasonable expectation of success in doing so because of three issues: (1) expected difficulties with belt mistracking when mounting a *Dynatek*-type conveyor (“*Dynatek*’s conveyor”) on a mobile bucket elevator like *Waldner*’s, (2) expected difficulties with the weight of *Dynatek*’s conveyor using a mounting system like *Waldner*’s (“*Waldner*’s mounting system”), and (3) the lack of any apparent way to attach *Dynatek*’s conveyor to a bucket elevator like *Waldner*’s (“*Waldner*’s bucket elevator”) so that the system has a transportable height. Each of these issues is discussed below.

(1) Belt Mistracking

Mistracking of a conveyor belt occurs when the conveyor is not level side-to-side. (Ex. 2004, ¶55.) When the left side of a belt conveyor is not at the same height as the right side, the belt will move, or “track,” from the high side to the low side.

(*Id.*) When a conveyor belt “mistracks,” it can result in damage to the conveyor belt, damage to the components that the belt runs up against, and/or material spillage, and the belt can even come off the rollers or cause a fire. (*Id.*)

A POSITA would recognize that if *Dynatek*’s conveyor were mounted on *Waldner*’s mobile bucket elevator, it would be especially susceptible to belt mistracking issues because of the ability of the two articulated conveyors to rotate relative to one another and relative to the bucket elevator. (*Id.*) Specifically, if the axis of rotation of the inner conveyor is not vertical, then the inner conveyor will become out of level side-to-side as it rotates into various positions and will have the potential to “mistrack.” (*Id.*) Also, if the inner conveyor is not level side-to-side, then the outer conveyor will similarly be out of level side-to-side. (*Id.*) Further, even if the inner conveyor *is* level side-to-side, if the outer conveyor does not rotate about a vertical axis, then the outer conveyor will become out of level side-to-side as it rotates into its various positions. (*Id.*) And, furthermore, if the inner conveyor is rotated upwards or downwards so that it is not horizontal (but is level side-to-side), then the outer conveyor will also not be horizontal and will become out of level side-to-side as it rotates into non-collinear positions. (*Id.*) In other words, at each step from the bucket elevator to the outer conveyor, each link in the chain can compound the potential mistracking problem. (*Id.*)

These mistracking issues would be amplified by the fact that *Dynatek's* conveyor would be operating at high elevations, away from the eyesight of the operator, and further amplified by the fact that the system would need to be transportable. (Ex. 2004, ¶¶56-57.)

None of these mistracking issues would have been present with *Waldner's* chute. (*Id.*, ¶58.) *Waldner's* chute cannot mistrack because it does not have a belt. (*Id.*) Indeed, the side-to-side level limitation does not apply to an enclosed tube like *Waldner's* chute, because material can flow equally well in whatever part of the tube is lowest. Even Dr. Durham conceded that *Waldner's* chute does not need to be level side-to-side because it is an enclosed tube.⁴ (Ex. 2003, 104:19-105:12.) Indeed, *Waldner's* chute only functions if it is *not* horizontal. (Ex. 2004, ¶58.) Because there are no mistracking issues with *Waldner's* chute, *Waldner's* mounting system does not account for mistracking. (*Id.*)

Likewise, because *Dynatek's* system is not designed for moving to a transportable configuration or being set up at temporary sites with different leveling conditions, the same mistracking issues are not present in or accounted for by *Dynatek*. (*Id.*) In contrast, if *Dynatek's* conveyor were substituted for *Waldner's*

⁴ Dr. Durham also apparently testified that *Dynatek's* conveyors do not need to be level because, like *Waldner's* chute, they are “enclosed.” (Ex. 2003, 105:3-14.) That is incorrect. Any enclosure would have no impact on whether *Dynatek's* belts will mistrack. (Ex. 2004, ¶59.)

chute, all the mistracking issues discussed above would arise where they previously did not exist. (*Id.*)

(2) Dynatek's Weight

The second difficulty with substituting *Dynatek's* conveyor for *Waldner's* chute would arise from attempting to use *Waldner's* mounting system to handle the weight of *Dynatek's* conveyors.⁵ *Dynatek's* conveyors would be much larger and heavier than a *Waldner*-type chute with comparable capacity. (Ex. 2004, ¶60.) A POSITA would have recognized that a more complex mounting system than *Waldner's* would be required to handle the higher weight and anticipated wind loads, particularly given the mistracking issues addressed above. (*Id.*) For example, a POSITA would be concerned that such a large weight extending from *Waldner's* bucket elevator frame would tend to rotate the bucket elevator out of vertical and result in mistracking of the *Dynatek* belt conveyors. (*Id.*) A POSITA would not have had a reasonable expectation of success in addressing those issues using *Waldner's* mounting system. (*Id.*)

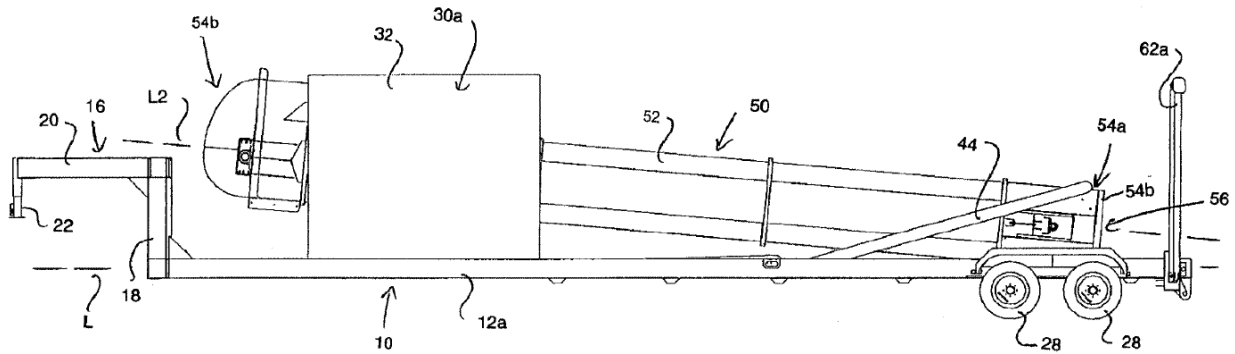
(3) Transportable Height

A third difficulty would have arisen in substituting *Dynatek's* conveyor for *Waldner's* chute because it would not have been apparent how to attach *Dynatek's*

⁵ *Dynatek's* mounting could not be used because it is incapable of moving between transport and operational positions. (Ex. 2004, ¶58.)

conveyor to *Waldner*'s bucket elevator frame such that in the transport configuration the overall system would have a transportable height. (Ex. 2004, ¶61.) 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. (*Id.*) Unlike *Waldner*'s chute, which has a relatively low and constant height profile (making it relatively straightforward to fold down alongside the bucket elevator in the transport configuration), *Dynatek* has two conveyor frames that are stacked vertically on top of one another in a stepped fashion. (*Id.*) A POSITA would ascertain that each of *Dynatek*'s conveyor frames is about 2.5 to 3 feet high, so that the two frames stacked on top of one another would be about 5 to 6 feet high (ignoring, for the moment, the retractable loading spout). (*Id.*) A POSITA would further appreciate that the truck ramps shown in *Waldner* would need to be about 10 feet wide to accommodate a conventional semitruck, so that the tops of the truck ramps in the transport configuration shown in Figure 6 of *Waldner* (and the outlet of the bucket elevator in line with the tops of the truck ramps) would be about 10 feet above the base of the trailer:

FIGURE 6



(*Id.*) Factoring in the trailer's axle height, a POSITA would have concluded that adding *Dynatek's* conveyor frames on top of the bucket elevator in the transport configuration would make the overall system about 16 to 17 feet off the ground, such that it would not be road legal, without even considering the height of *Dynatek's* retractable loading spout or a larger suspension to deal with greater weight. (*Id.*)

Due to at least these three issues, a POSITA would not have had a reasonable expectation of success in substituting *Dynatek's* conveyor for *Waldner's* chute. (Ex. 2004, ¶¶52-62.) This conclusion is confirmed by the fact that the '689 inventors did not use the proposed substitution despite knowing of *Dynatek*. They did not use *Dynatek's* conveyor but instead used lower weight, lower height slider-bed belt conveyors. (Ex. 2004, ¶63; Ex. 2005, ¶12.) They did not use *Waldner's* mounting system. (Ex. 2004, ¶64.) They invented a unique way to fold the articulated slider-bed conveyors in the transport configuration to further minimize the system's height.

(Ex. 2004, ¶63.) And they included a number of features to address mistracking. (Ex. 2004, ¶65; Ex. 2005, ¶14.) A POSITA with just *Waldner* and *Dynatek* and without the '689 Patent's disclosure would not have had a reasonable expectation of success in arriving at the invention of claim 1. (Ex. 2004, ¶¶52-65.)

4. Solaris's Conclusory Testimony Fails to Show That, Alternatively, It Would Have Been Obvious to "Modify" *Waldner's* Chute to "Add" or "Include" Conveyor Belts

As explained above, Solaris fails on its primary argument that substituting *Dynatek's* conveyor for *Waldner's* chute would have been obvious. In the alternative, Solaris argues that it would have been obvious to "modify *Waldner's* system based on *Dynatek's* teachings by adding belt conveyors to the discharge chute" or to "modify discharge chute 242 to include one or more conveyor belts." (Paper 1, pp. 27, 40-41.) That argument fails because it relies solely on vague and conclusory testimony.⁶

As support for this argument, Solaris's petition first cites paragraphs 116-118 and 185 of Dr. Durham's declaration. (Paper 1, p. 27.) But those paragraphs say

⁶ Relying on Dr. Durham, Solaris also asserts that a POSITA would have modified *Waldner's* chute to incorporate *Dynatek's* pivot joint to satisfy limitations 1[j] and 1[k] (and corresponding limitations in claims 16, 18, 22, and 23). (Paper 1, pp. 44-45, 58-63 (citing Ex. 1003, ¶¶161-162, 207-209, 227-230, 236-238, 248-250, 260-261).) That assertion is unsupported and wrong. (Ex. 2004, ¶¶82, 88-89, 99-101.) But even if true, it ultimately does not matter because limitations 1[h] and 1[i] (and corresponding limitations in claims 16, 18, 22, and 23) are not satisfied for the reasons explained above. (*Id.*, ¶¶83, 88, 100.)

nothing about “adding belt conveyors to the discharge chute.” Later, Solaris points to paragraphs 147-153 and 157 of Dr. Durham’s declaration. (Paper 1, pp. 41, 43.) But the only potentially relevant testimony in those paragraphs are conclusory statements that “Discharge chute member 242 is modified per the teachings of *Dynatek* to have ‘open or closed conveying arms, each containing its own belt conveyor’” and that “it would have been obvious to a POSITA...to modify discharge chute member 242 to include one or more conveyor belts.” (Ex. 1003, ¶¶152, 157.)

Nowhere is there any explanation about how conveyor belts would be added to or included with *Waldner*’s chute or what such a combination would look like. For example, it is not clear whether Solaris is arguing that the conveyor belts would be added to the end of *Waldner*’s chute or whether they would be placed within *Waldner*’s chute. Nor has Solaris or Dr. Durham provided any reason to arrive at either configuration. The mere fact that *Waldner* discloses a chute and that *Dynatek* discloses belt conveyors would not have suggested appending one to the other or putting one inside the other. (Ex. 2004, ¶50.) In fact, a POSITA would conclude that at least one such configuration would result in significant wear on the belt and low reliability while providing no apparent advantage compared to *Waldner* individually. (*Id.*) Solaris has failed to show that it would have been obvious to modify *Waldner*’s chute in some unspecified way to “add” or “include” belt conveyors.

B. Ground 1 Fails for Claims 2, 4-11, 16-20, and 22-24 for the Same Reasons That It Fails for Claim 1

As demonstrated above, *Waldner* does not disclose “an extension conveyor for moving aggregate” that has an “outboard segment” that is “pivotally connected” to an “inboard segment” (limitations 1[h], 1[i], and 1[j]). For at least the same reasons that *Waldner* does not disclose those limitations, *Waldner* does not disclose limitations 16[h]/16[i]/16[j], 18[g]/18[h]/18[i], 22[g]/22[h]/22[i]/22[j], and 23[g]/23[h]/23[i]/23[j]. (See Ex. 2004, ¶¶81, 87, 102-103, 106-107.) Similarly, for at least the same reasons that *Waldner* does not disclose limitation 1[k], *Waldner* does not disclose limitations 17, 18[i], 22[i], and 23[i], requiring the inboard and outboard segments to pivot about a “substantially vertical axis.” (See *id.*, ¶86.)

Solaris argues that these limitations in these other claims are met by the combination of *Waldner* and *Dynatek* for the same reasons as limitations 1[h], 1[i], 1[j], and 1[k] are met for purposes of claim 1. (Paper 1, pp. 58, 59, 60, 62, 63.) But for all the reasons that the *Waldner/Dynatek* combination does not satisfy claim 1, that combination does not satisfy independent claims 16, 18, 22, and 23 (or their dependent claims 2, 4-11, 17, 19-20, and 24).⁷ (Ex. 2004, ¶¶84-85, 90-95, 104-105, 109-110.)

⁷ Solaris and Dr. Durham also make another factual error in asserting that *Waldner*’s chute “is in a near horizontal orientation” and “substantially perpendicular” to *Waldner*’s bucket elevator in arguing claim 4. (Ex. 2004, ¶67.)

C. Ground 1 Fails for Claim 6 for Additional Reasons

Even if the *Waldner/Dynatek* combination demonstrates obviousness for claim 1, it does not do so for claim 6. Claim 6 recites “a conveyor support frame...being movable with respect to the deployable frame of the aggregate elevating assembly when the extension conveyor moves between the lowered position and the raised position.” Solaris argues that *Waldner*’s “brackets 252a/252b, links 256/262, and the horizontal and vertical pivot pins collectively” qualify as a “conveyor support frame” and “would be movable when transitioning between the lowered and raised positions.” (Paper 1, p. 49.)

Solaris misapprehends how *Waldner*’s parts operate. Below is an annotated snippet from *Waldner*’s Figure 22A, showing “brackets 252a/252b, links 256/262, and the horizontal and vertical pivot pins” to which Solaris refers:

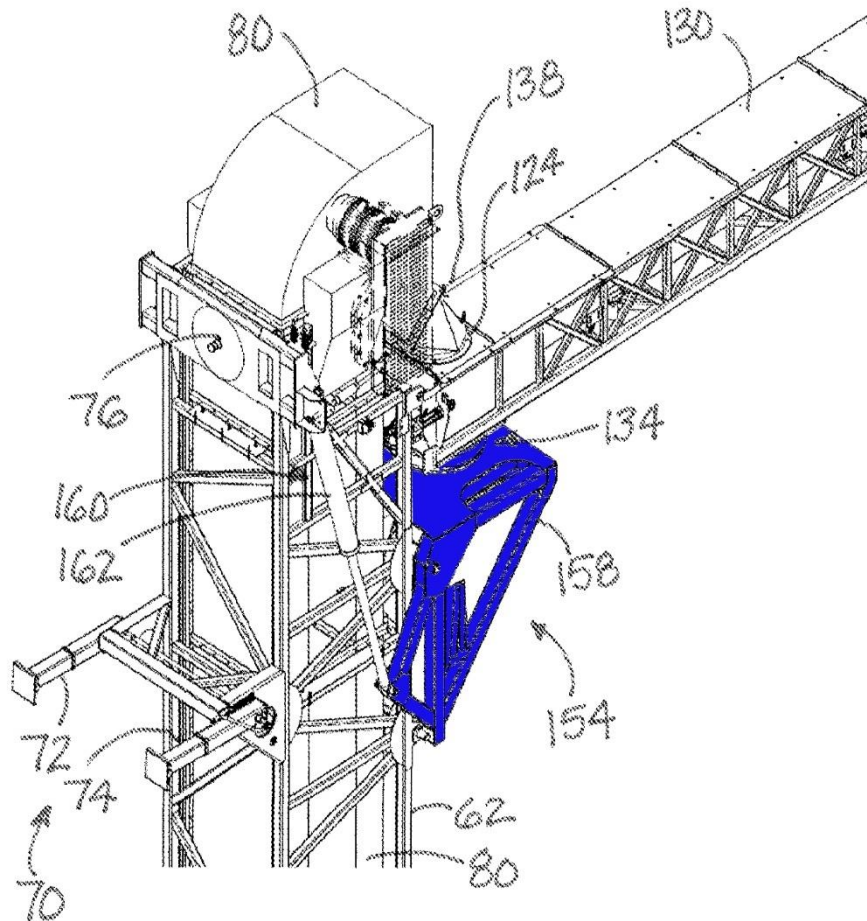
(Ex. 2004, ¶71.) Again, Dr. Durham agreed. (Ex. 2003, 118:13-119:2.) Obviously, the vertical pivot pins joining those parts (along the red dashed line) would also not move as required. (Ex. 2004, ¶71.)

Dr. Durham argued at his deposition that pivot pins 258/264 would “rotate” in place during raising/lowering of *Waldner*’s chute and that such rotation qualifies as being “movable with respect to the deployable frame.” (Ex. 2003, 120:10-122:4.) That argument should be rejected for three reasons. First, rotating in place is not movement “with respect to the deployable frame,” as a POSITA would understand that language, because the pins do not get any closer to or further from the frame when they “rotate.” (Ex. 2004, ¶72.) Second, Dr. Durham’s argument assumes that pins 258/264 are not integrally formed with links 256/262; if they were, they would not rotate, even in place. (*Id.*) *Waldner* is silent on whether pins 258/264 are integrally formed with (or otherwise fixed to) links 256/262. Consequently, *Waldner* does not expressly or inherently teach the movement on which Dr. Durham relies. Third, even if *Waldner* is deemed to teach that pins 258/264 rotate in place and even if that rotation qualifies as movement “with respect to the deployable frame,” pins 258/264 alone are not “a conveyor support frame” because they are not a “frame” that supports a conveyor. (*Id.*, ¶¶72-73.) Indeed, Solaris has only argued that *Waldner*’s “brackets 252a/252b, links 256/262, and the horizontal and vertical pivot pins collectively” qualify as a “conveyor support frame.” (Paper 1, p. 49.)

Solaris also points to *Dynatek*'s "truss-framing" colored red in the figure below, and although Solaris does not expressly equate it with the claimed "conveyor support frame," Dr. Durham does so:



(Paper 1, pp. 49-50 (annotations by Solaris); Ex. 1003, ¶178.) This argument fails because it ignores the '689 Patent's teachings about the "conveyor support frame." "Conveyor support frame 154" is colored blue in the following snippet of Figure 8C:



Notably, Figure 8C also depicts a “truss frame” as part of inner segment 130 of the extension conveyor, and the specification labels it as “the truss frame of the inboard conveyor segment.” (Ex. 1001, 11:46-47.) But the specification identifies a *different* structure (154) as the “conveyor support frame.” In addition, the ’689 specification describes—and claim 6 requires—a “conveyor support frame supporting **the segments of the extension conveyor on the aggregate elevating assembly.**” (Ex. 1001, 11:10-25, 17:38-40.) This language does not merely require the “conveyor support frame” to “support” the “extension conveyor” (as the truss frame comprising segment 130 might be said to do) but further requires that it support the extension

conveyor “on the aggregate elevating assembly” (which the truss frame comprising segment 130 does not do). For the same reason that the truss frame comprising segment 130 does not qualify as the “conveyor support frame” of claim 6, the truss frames to which Solaris points in *Dynatek* do not so qualify. (Ex. 2004, ¶¶74-75.)

D. Ground 1 Fails for Claim 7 for Additional Reasons

Even if the *Waldner/Dynatek* combination demonstrates obviousness for claim 1, it does not do so for claim 7. Claim 7 requires an actuator that is “extendable to...move the extension conveyor **to the raised position**” and “retractable to...move the extension conveyor **to the lowered position.**” Solaris points to *Waldner*’s actuator 270 as the “extension actuator” of claim 7. (Paper 1, pp. 50-51.) But actuator 270 causes *Waldner*’s chute to move **horizontally** and not vertically as claim 7 requires. (Ex. 1004, 25:52-57, 26:58-61; Ex. 2004, ¶76.) Thus, Solaris’s reliance on actuator 270 is misplaced.

Although not relied upon by Solaris, Dr. Durham also points to *Waldner*’s actuator 266. (Ex. 1003, ¶181.) But actuator 266 fails to teach the other limitations of claim 7. Specifically, it is not “extendable” to “pivot” a “**conveyor support frame away from** the deployable frame” or “retractable” to “pivot” a “**conveyor support frame toward** the deployable frame.” Rather, when actuator 266 extends, it moves the inner end of *Waldner*’s chute **toward** the deployable frame, and anything that might be argued to be a “conveyor support frame” does not move at all—and

certainly not **away** from the deployable frame. (Ex. 2004, ¶76.) Conversely, when actuator 266 retracts, it moves the inner end of the chute **away from** the deployable frame, and anything that might be argued to be a “conveyor support frame” does not move at all—and certainly not **toward** the deployable frame. (*Id.*) Dr. Durham points to the fact that actuator 266 moves the **discharge end** of the chute away from or toward the deployable frame (Ex. 1003, ¶181), but the chute’s discharge end is clearly not a “conveyor support frame.” Thus, actuator 266 does not satisfy claim 7 either.

V. GROUND 1A: Solaris Has Failed to Prove Obviousness of Claims 1-2, 4-11, 16-20, and 22-24 Based on *Waldner*, *Dynatek*, and *Sleeman*

Solaris’s “Ground 1A” is premised on the theory that “*Waldner* teaches detaching its discharge chute 242 from the outlet port of the bucket elevator...when the system is placed in its collapsed (transport) position.” (Paper 1, p. 64; Ex. 1003, ¶¶272-273.) Solaris points to *Sleeman* as “not requir[ing] an operator to detach and reattach” such a component. (Paper 1, p. 65.) But Solaris and Dr. Durham have misread *Waldner*. *Waldner*’s chute is **not** detached when the system is in its collapsed/transport position. (Ex. 2004, ¶¶119-122; Ex. 1004, 27:59-65; Figs. 9, 16.) Therefore, the reason for which Solaris has relied on *Sleeman* is faulty.

A. Ground 1A Fails for the Same Reasons as Ground 1

Ground 1A fails for the same reasons as Ground 1. *Sleeman*’s “gravity discharge spouts 50” are not materially different from *Waldner*’s chute for purposes

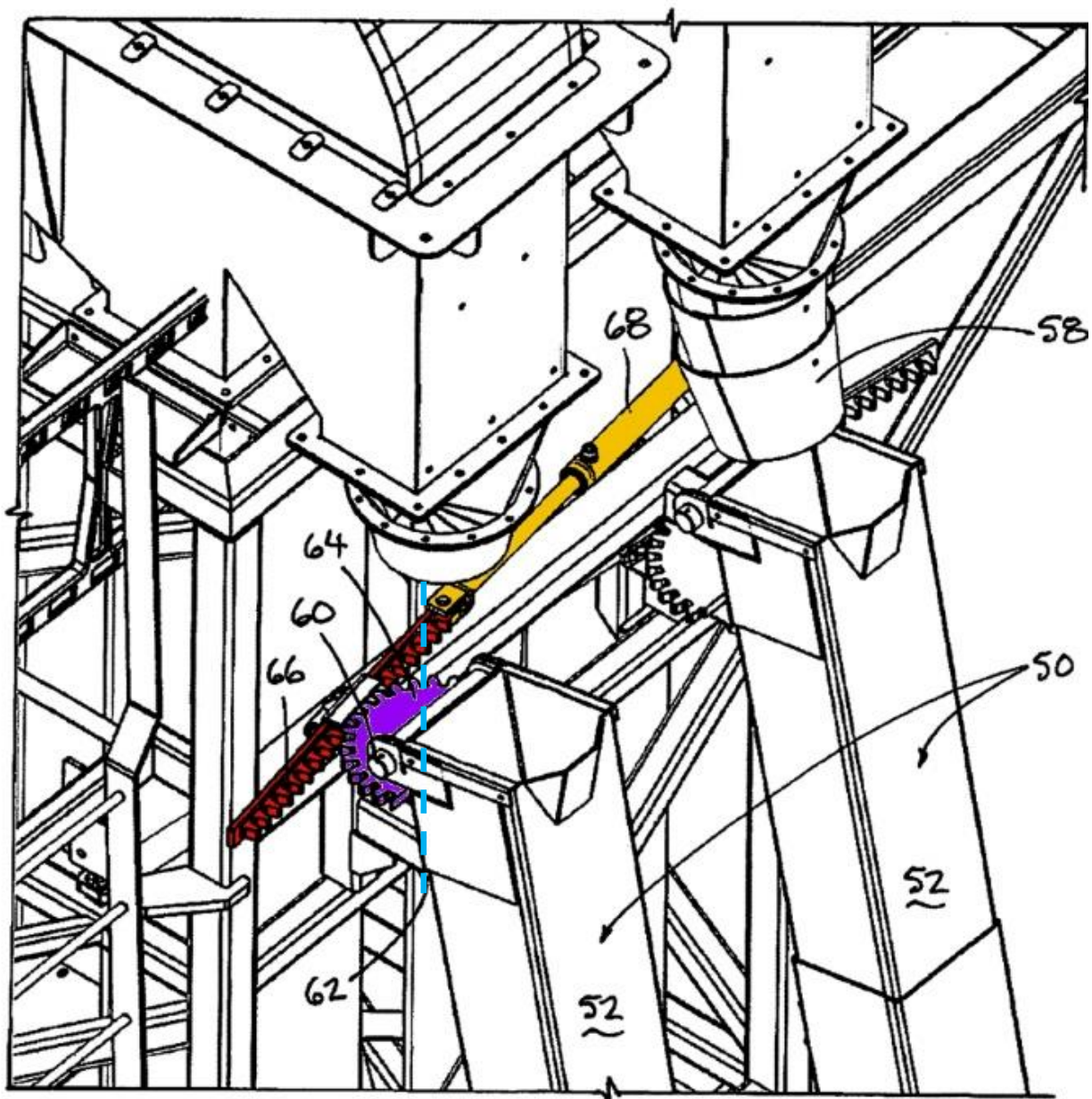
of independent claims 1, 16, 18, 22, and 23. For the same reasons that *Waldner*'s chute does not qualify as "a conveyor extension assembly for conveying aggregate" as limitation 1[h] requires or as "an extension conveyor for moving aggregate" as limitation 1[i] requires (and as the corresponding limitations in claims 16, 18, 22, and 23 require), neither do *Sleeman*'s spouts. (Ex. 2004, ¶¶112-113, 115.) And just as with *Waldner*, Solaris does not even attempt to argue that *Sleeman*'s spouts satisfy limitations 1[j] (and corresponding limitations in claims 16, 18, 22, and 23) requiring an "outboard segment" that is "pivotally connected" to an "inboard segment" or limitation 1[k] (and corresponding limitations in claims 17, 18, 22, and 23) requiring that pivot to be about "a substantially vertical axis." (Paper 1, pp. 70-71, 74, 75.) Instead, Ground 1A relies on *Dynatek* to satisfy those limitations, just as Ground 1 does. (*Id.*) For the same reasons that the *Waldner/Dynatek* combination fails in Ground 1, the *Waldner/Dynatek/Sleeman* combination fails in Ground 1A.

Additionally, Solaris's motivations for adding *Sleeman* to the *Waldner/Dynatek* combination mimic those for combining *Dynatek* with *Waldner* and fail for the same reasons. (Ex. 2004, ¶¶114-122.)

B. Ground 1A Fails to Cure Ground 1's Additional Deficiencies for Claims 6-7

Ground 1A also fails to cure Ground 1's additional deficiencies for Claims 6 and 7.⁸ Solaris argues that *Sleeman*'s actuator 68 qualifies as the "extension conveyor lift structure" of claims 6 and 7. (Paper 1, p. 72-73.) That is incorrect. As the annotated Figure 12 of *Sleeman* shows below, actuator 68 is not a "lift structure" at all. It does not move *Sleeman*'s spouts "***between the lowered position and the raised position,***" (claim 6) or "to the raised position" and "to the lowered position" (claim 7). Instead, actuator 68 [in orange] acts upon rack 66 [in red], which rotates gear 64 [in purple] about vertical shaft 62 [blue dashed line], to move *Sleeman*'s spouts 50 ***left and right***:

⁸ In arguing limitation 6[a], Solaris and Dr. Durham mistakenly characterize their Ground 1 arguments as addressing *Dynatek*'s conveyor support frame when that argument only addresses *Waldner*'s support frame. (Ex. 2004, ¶124.)



(Ex. 2004, ¶¶125-127.) At his deposition, Dr. Durham agreed. (Ex. 2003, 123:23-124:21.) Thus, the addition of *Sleeman* in Ground 1A does not cure Ground 1's deficiencies for claims 6 and 7. (*Id.*)

VI. GROUND 2: Solaris Has Failed to Prove Obviousness of Claims 6-7 Based on *Waldner*, *Dynatek*, and *Pham*

A. Ground 2 Fails for the Same Reasons That Ground 1 Fails for Claim 1

Solaris argues for “Ground 2” that claims 6-7 would have been obvious based on *Waldner*, *Dynatek*, and *Pham*. (Paper 1, pp. 75-79.) But Ground 2 fails for the same reasons as Ground 1 fails for claim 1. Claims 6 and 7 depend from claim 1 and therefore require all its limitations. Solaris does not rely on *Pham* to cure any of the defects in its Ground 1 arguments for claim 1, relying instead on the *Waldner/Dynatek* combination from Ground 1 to satisfy claim 1’s limitations. (Paper 1, pp. 77, 78, 79, 48, 50-51.) For all the reasons that Ground 1 fails for claim 1, Ground 2 fails for claims 6-7.

B. Ground 2 Fails to Cure Ground 1’s Additional Deficiencies for Claims 6-7

As explained in sections IV.C and IV.D, even if the *Waldner/Dynatek* combination of Ground 1 demonstrates obviousness of claim 1, it does not do so for claims 6 and 7. The addition of *Pham* in Ground 2 does not cure Ground 1’s deficiencies for claims 6 and 7 for reasons set forth below.

1. Solaris’s Alleged Motivation for Combining *Pham* with *Waldner* and *Dynatek* Does Not Withstand Scrutiny

Solaris first argues that *Pham* “is analogous art.” (Paper 1, p. 75.) Masaba does not ultimately dispute that *Pham* is “analogous art,” but the broad, general similarities that qualify *Pham* as “analogous art” do not provide a motivation for

cherry picking the specific features from *Waldner* and *Pham* and *Dynatek* that Solaris selects for claims 6 and 7. (Ex. 2004, ¶¶129-135.)

The only specific motivation that Solaris and Dr. Durham provide is an assertion that the *Pham/Waldner/Dynatek* combination would “be more easily convertible and transportable on *Waldner*’s trailer.” (Paper 1, pp. 76, 79 (citing Ex. 1003, ¶¶299-300, 308).) But neither Solaris nor Dr. Durham provides any analysis or explanation as to why the combination would provide that benefit. *Waldner*’s actuator 266 already allows *Waldner*’s chute to lower vertically to a transport position on a trailer. (Ex. 1004, 15:14-21, 25:20-26:63, Figs. 5-6, 9, & 16.) Thus, the assertion that the *Pham* combination would “be more easily convertible and transportable on *Waldner*’s trailer” does not make sense. Indeed, Mr. Anderson testifies that “using *Pham*’s support frame and articulation mechanism instead of *Waldner*’s brackets 252 would **not** result in something that is ‘more easily transported on *Waldner*’s trailer.’” (Ex. 2004, ¶¶131, 134, 138.)

It appears that Solaris and Dr. Durham have made this assertion based on their previously expressed belief that *Waldner*’s chute must be detached to move from the deployed position to the stowed position. (Paper 1, p. 64, 65; Ex. 1003, ¶¶272-273.) But, as demonstrated above, that belief is mistaken. (Ex. 2004, ¶¶119-120, 132.) Thus, Solaris’s proffered “motivation” for Ground 2 is a fiction.

2. Modifying *Waldner* and *Dynatek* to Use the Support Frame of *Pham* Would Fail to Satisfy Claim 1, and by Consequence, Claim 6

Even if there were a motivation, Solaris's theory of obviousness for claim 6 fails. Solaris argues that instead of *Waldner*'s brackets 252a/252b, a POSITA would have used *Pham*'s articulated support frame 802 and articulation mechanism 808. (Paper 1, p. 76 (citing Ex. 1003, ¶¶299-300).) Those components are seen in *Pham*'s Figure 19:

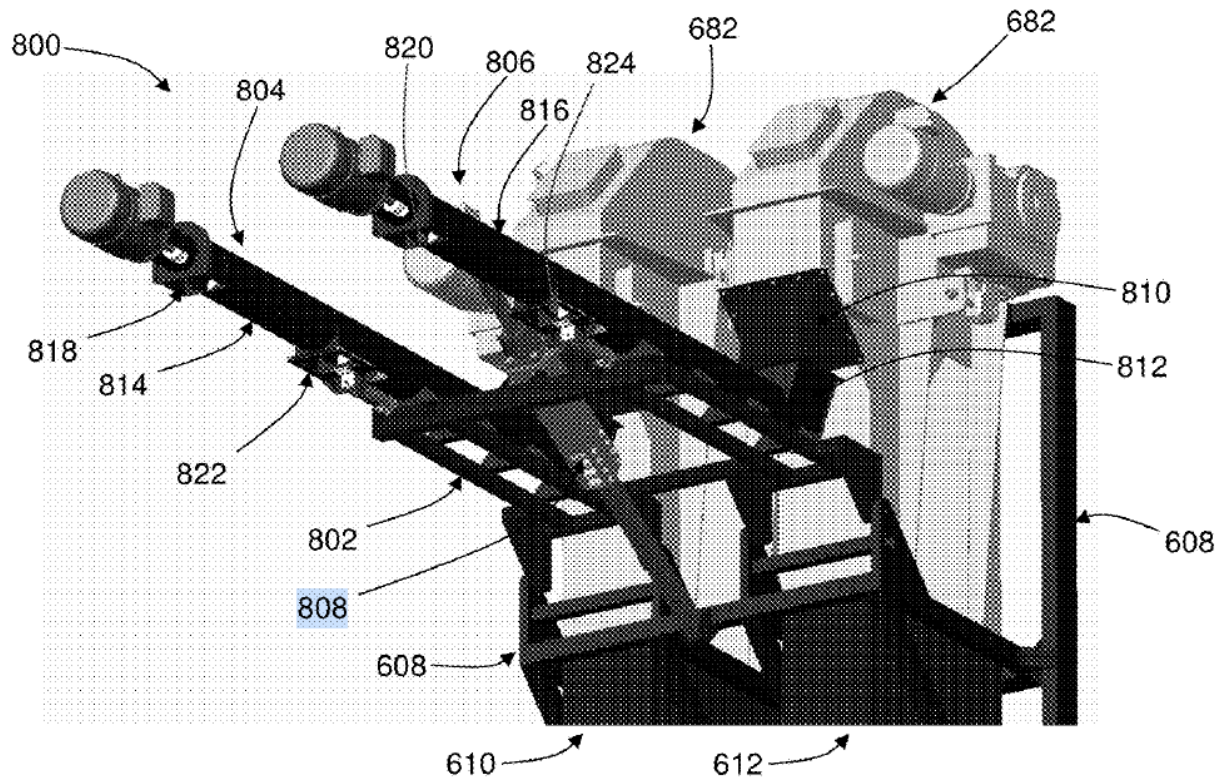


FIG. 19

As seen above, however, support frame 802 rotates in the vertical direction (as required by claim 6), but not in the horizontal direction (as required by claim 1).⁹ (Ex. 1008, Fig. 19, 14:15-25; Ex. 2004, ¶133.) Thus, even if a POSITA modified the *Waldner/Dynatek* combination with *Pham* as Solaris argues, the combination would fail to satisfy claim 1 and therefore claim 6 which depends from it. (Ex. 2004, ¶133.)

VII. GROUND 2A: Solaris Has Failed to Prove Obviousness of Claims 6-7 Based on *Waldner, Dynatek, Sleeman, and Pham*

Solaris’s “Ground 2A” is conclusory and unsupported. It first argues that “a POSITA would have deemed it obvious to combine *Pham* with *Waldner, Dynatek, and Sleeman*” “[f]or the same reasons in §VII.A.2.a)1 and §VII.A.2.a)1.” (Paper 1, p. 80.) But §VII.A.2.a)1 does not exist, and §VII.A.2.a. does not address *Pham, Dynatek, or Sleeman*—only *Waldner* and the preamble of claim 1. (Paper 1, p. 28.) Providing no analysis, Solaris also cites Dr. Durham’s declaration at paragraphs 309-310, 111-121, 265-274, and 293-300. (*Id.*) But paragraphs 309-310 merely assert that a POSITA would have combined *Pham* with *Waldner, Dynatek, and Sleeman* for the same reasons as *Waldner, Dynatek, and Sleeman* in Ground 1A (addressed in his paragraphs 265-274) and *Waldner, Dynatek, and Pham* in Ground 2 (addressed

⁹ In addition, Dr. Durham’s analysis of how *Pham*’s frame would be substituted for *Waldner*’s brackets is based on a misunderstanding of how *Waldner*’s brackets function. (Ex. 2004, ¶136.)

in his paragraphs 293-300). Nowhere does Solaris or Dr. Durham address combining all four references together.

Solaris’s “Ground 2A” next provides its entire argument about the results of the combination in one conclusory sentence: “*Waldner* in view of *Dynatek*, *Sleeman*, and *Pham* renders Claims 6-7 obvious.” (Paper 1, p. 80.) None of the support cited for that sentence provides any analysis of the combination of *Waldner*, *Dynatek*, *Sleeman*, **and** *Pham*.

The Board should reject Ground 2A because the Petition fails to articulate how this combination renders claims 6 and 7 obvious. To the extent the Board substantively considers Ground 2A, it fails for the same reasons as Grounds 1A and 2. (Ex. 2004, ¶¶139-140; *supra* sections V, VI.)

VIII. GROUND 3: Solaris Has Failed to Prove Obviousness of Claims 3, 12, 21, and 25 Based on *Waldner*, *Dynatek*, and *Auld*

A. Ground 3 Fails for the Same Reasons That Ground 1 Fails for Claim 1

Solaris argues for “Ground 3” that claims 3, 12, 21, and 25 would have been obvious based on *Waldner*, *Dynatek*, and *Auld*. (Paper 1, pp. 80-90.) But Ground 3 fails for the same reasons as Ground 1 fails for claim 1. Claim 3 depends from claim 2, which depends from claim 1, and therefore includes limitations 1[h], 1[i], 1[j], and 1[k]. Claim 12 contains limitations 1[h], 1[i], and 1[j], in limitations 12[h], 12[i], and 12[j]. Claim 21 depends from claim 18, which contains limitations 1[h], 1[i],

1[j], and 1[k] in limitations 18[g], 18[h], and 18[i]. And claim 25 contains those same limitations, in limitations 25[g], 25[h], and 25[i]. Solaris does not rely on *Auld* to cure any of the defects in its Ground 1 arguments, relying instead on the *Waldner/Dynatek* combination from Ground 1 for claim 1 to satisfy the equivalent limitations in claims 3, 12, 21, and 25. (Paper 1, pp. 85, 89, 90.) For all the reasons that Ground 1 fails for claim 1, Ground 3 fails for claims 3, 12, 21, and 25. (Ex. 2004, ¶¶156-166.)

B. Ground 3 Fails for Additional Reasons

Ground 3 fails for additional reasons. Claims 12 and 25 require that “the aggregate elevating assembly” (i.e., the bucket elevator assembly) include “a kingpin mounted on the deployable frame toward the free end of the deployable frame...to engage a hitch of a towing vehicle....” (Ex. 1001, 19:9-22, 24:50-63.) Under 35 U.S.C. § 112(f), the “trailer structure” elements of claims 3 and 21 require the combination of (1) a kingpin mounted toward the free end of the deployable frame and (2) at least one landing leg mounted on the deployable frame (or an equivalent of that combination).¹⁰ Thus, all the claims at issue require a kingpin mounted toward the free end of the bucket elevator frame. This feature is one of the

¹⁰ Solaris argues that the “corresponding structure” is merely “a kingpin mounted on the deployable frame toward its free end.” (Paper 1, pp. 24-25.) But the specification explains that trailer structure 70 also includes “at least one landing leg 72 mounted on the deployable frame.” (Ex. 1001, 7:42-8:5, 7:51-56.)

most creative and unique aspects of the '689 Patent. *Waldner* places its bucket elevator on a gooseneck trailer with a conventional hitch ***on the trailer***, but the '689 inventors put a kingpin ***on the bucket elevator frame***.

Solaris argues this would have been obvious because of *Auld*—which discloses a kingpin ***on a silo for storing cement***—and because *Waldner* states that, besides its gooseneck connection, “other hitch types may alternatively be employed.” (Paper 1, pp. 81, 82 (citing Ex. 1003, ¶¶317-321, 326).) Not even close.

First of all, *Auld* is not even analogous art. *Auld* is entitled “Cement Mixing Plant” and discloses a portable concrete batching plant “having a primary object of loading the proper amount of each type of aggregate and cement and other materials into a transit mixer truck or stationary mixer in a convenient and rapid manner.”¹¹ (Ex. 1009, 1:8-13.) The field of endeavor for *Auld* is mixing concrete, whereas the field of endeavor for the '689 Patent is transferring aggregate. The problem solved by *Auld* is how to measure and load proper amounts of ingredients to make concrete using a transportable mixing system, whereas the problem solved by the '689 Patent is how to transfer aggregate to an elevated location such as the inlet of a silo using a transportable aggregate transferring system. (See Ex. 1004, ¶¶36, 38, 117, 130.) It is

¹¹ Solaris and Dr. Durham state that the *Auld*'s cement batching plant handles the aggregates “stone, gravel, and sand.” (Paper 1, p. 80 (citing Ex. 1003, ¶316).) But it does not, and cement is not an aggregate. (Ex. 2004, ¶142-143.)

true that both references deal with transportability, but transportability of two different things.

Even if *Auld* is “analogous art,” the differences in purpose are still significant in the obviousness analysis. See *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992) (“If [the prior art] is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it.”).

Critically, Solaris’s theory of obviousness goes way beyond using an alternative hitch type. Solaris cites to paragraph 318 of Dr. Durham’s declaration, in which he not only asserts that it would have been obvious to use the kingpin connection of *Auld* instead of the gooseneck connection of *Waldner* but that it would **also** have been obvious to have the kingpin “**connected directly to Waldner’s elevator 50.**” (Ex. 1003, ¶318, cited in Paper 1, p. 81.) But Durham points to no reason that a POSITA would have connected *Auld*’s kingpin “directly to *Waldner*’s elevator 50.” (*Id.*) As Mr. Anderson explains, the statement in *Waldner* that “[o]ther hitch types may alternatively be employed” would at most have been a reason to use *Auld*’s kingpin 57 on *Waldner*’s trailer, not on *Waldner*’s bucket elevator. (Ex. 2004, ¶¶144-145.) This is yet another example of Solaris and Dr. Durham using improper hindsight.

As Mr. Anderson further explains, a POSITA would not have viewed the kingpin 57 attached to silo 41 in *Auld* and conceived of attaching a kingpin to

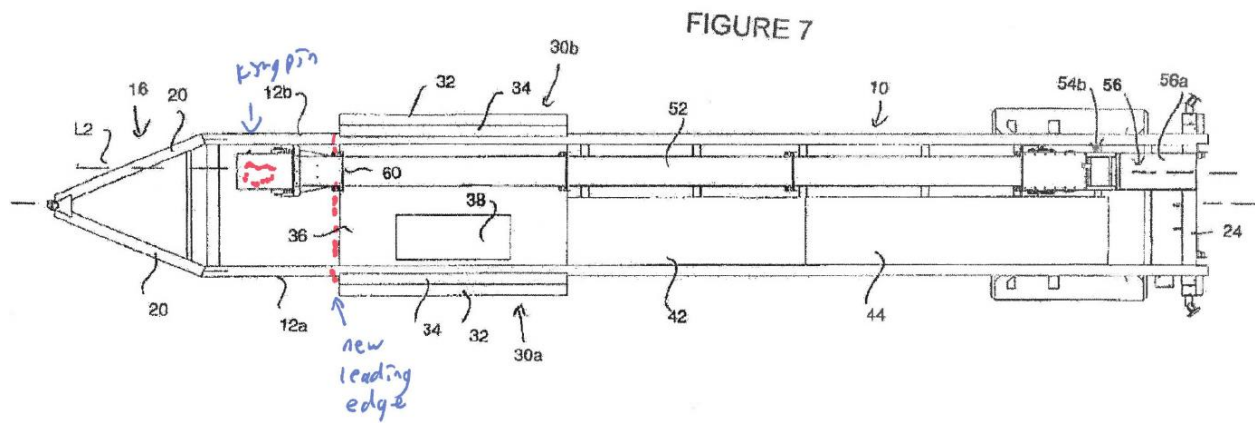
Waldner's bucket elevator. (Ex. 2004, ¶146.) When two things are similar, it may be natural for a POSITA to think of doing to one what is done to the other. But here, there are substantial differences between *Auld's* silo and *Waldner's* bucket elevator. (*Id.*) First, a silo is not a bucket elevator and performs a storage function that is different from the transferring function of a bucket elevator. Therefore, *Auld* does not show a kingpin attached to a bucket elevator or anything like it. (*Id.*) Second, in *Auld*, the entirety of silo 41 (wheels 58 and all) is turned upright and lifted into position using a crane. (Ex. 1009, 5:3-4). In contrast, *Waldner's* bucket elevator is rotated upward by hydraulic cylinders coupled between a trailer frame and the bucket elevator's frame while *Waldner's* trailer wheels 28 remain on the ground. (Ex. 1003, 2:37-3:36, 12:52-14:1; 15:47-62, 15:22-35, 19:25-34, 24:66-25:2.) In other words, the kingpin in *Auld* is not attached to a structure that rotates upwards relative to wheels resting on the ground. Instead, it is attached to a structure that is attached to wheels and whose entirety is turned upright and lifted into position. Because of these differences, a POSITA would not have viewed kingpin 57 attached to *Auld's* silo and thought about attaching a kingpin to *Waldner's* bucket elevator. (Ex. 2004, ¶146.) *Auld's* silo and *Waldner's* bucket elevator are simply not analogous enough to each other for a POSITA to have thought of doing to one what is done to the other. (*Id.*) This is especially true because *Waldner* already has a hitch coupler 22 that allows *Waldner's* system to be attached to a transport vehicle, so a

POSITA would not have recognized any need to attach a structure for performing that same function at another location in *Waldner*. (*Id.*) Instead, such a modification would have required creativity beyond that of a POSITA, and it is apparent that Durham is relying on hindsight to propose such a modification. (*Id.*)

Other hindsight rationales offered by Solaris and Dr. Durham are that a POSITA would have done this to “reduc[e] frame material,” to “reduc[e]...overall length of the trailer,” and to “more evenly distribut[e] the load across the towing vehicle’s bed and the trailer.” (Paper 1, p. 81 (citing Ex. 1003, ¶¶319-320); *see also* Ex. 1003, ¶¶331, 349, *cited in* Paper 1, pp. 85, 89.) But Mr. Anderson explains that a POSITA would not have recognized these advantages of connecting a kingpin to *Waldner*’s bucket elevator because a POSITA would not have conceived of such a connection in the first place. (Ex. 2004, ¶¶145-146, 148-149, 154-155.) Mr. Anderson further explains that, contrary to Dr. Durham’s assertions, “[a] kingpin/fifth wheel connection would provide the same distribution advantages across the bed of the transport vehicle as a gooseneck connection.” (Ex. 2004, ¶147.) This is because both are single-point connections, and the hitch point for both connection types is in the same position above the transport vehicle’s back axle(s). (*Id.*) Because the connection points are in the same position relative to the vehicle’s bed, those connection points result in the same weight distribution across the

vehicle's bed. (*Id.*) Therefore, Durham's assertion that "more even" load distribution would have motivated putting a kingpin on *Waldner's* bucket elevator is pure fiction.

In fact, if a POSITA would have conceived of attaching a kingpin to *Waldner's* bucket elevator, implementing that attachment would have created several problems that would have removed any expectation of success. First, as illustrated by Dr. Durham, placing the kingpin on *Waldner's* elevator would result in the hitch coupler being off the trailer's centerline:



(Ex. 2003, 124:22-126:21; Ex. 2002.) Moving the towing point off the trailer's centerline would result in significant alignment and wear problems for the tires, problems Dr. Durham quickly acknowledged. (Ex. 2003, 126:21-127:1; *see also* Ex. 2004, ¶150.) However, he then nonsensically asserted that switching the bucket elevator to the opposite side of the trailer and swapping it with conveyors 42 and 44 would somehow move the kingpin closer to the trailer's centerline. (Ex. 2003, 127:2-

130:12.) That is wrong. That switch would simply create the mirror image of *Waldner's* Figure 7, and the kingpin would be no closer to the trailer's centerline than before. (Ex. 2004, ¶151.) Realizing his error, Dr. Durham suggested moving the kingpin off the bucket elevator's centerline to place the kingpin closer to (but not at) the trailer's centerline. (Ex. 2003, 127:17-21, 129:9-13.) But placing the kingpin so that it is offset from the bucket elevator's centerline would add torsional forces to the already-present bending forces in the bucket elevator during towing and would require reinforcing the bucket elevator (and would not solve the off-the-trailer-centerline problems). (Ex. 2004, ¶151.) To eliminate these problems, the bucket elevator would have to be centered between the trailer's axles/wheels, as in the '689 Patent. (Ex. 2004, ¶150; *see* Ex. 1001, Fig. 2B.) Moving *Waldner's* elevator to be centered between those wheels would either require reconfiguring the location of conveyors 42 and 44 or widening the distance between the wheels. (Ex. 2004, ¶150.) But reconfiguring the location of conveyors 42 and 44 would have introduced yet additional complications, and widening the distance between the wheels would have made the structure less transportable. (*Id.*) Thus, if a POSITA had thought of putting a kingpin on the bucket elevator (and a POSITA would not have done so), these additional complications would have motivated a POSITA **not** to do so and would have removed virtually all expectation of success. (Ex. 2004, ¶¶150-152.) Durham's

proposed reconfigurations and their associated complications demonstrate that Durham is relying on hindsight.

IX. GROUND 3A: Solaris Has Failed to Prove Obviousness of Claims 3, 12, 21, and 25 Based on *Waldner*, *Dynatek*, *Sleeman*, and *Auld*

Ground 3A is conclusory and unsupported. As with Ground 2A, it refers to a non-existent “§VII.A.2.a)1.” (Paper 1, p. 90.) Then, providing no analysis, Solaris merely cites Dr. Durham’s declaration at paragraphs 365-366, 111-121, 265-274, and 313-326. (*Id.*) But paragraphs 365-366 merely assert that a POSITA would have combined *Auld* with *Waldner*, *Dynatek*, and *Sleeman* for the same reasons as *Waldner*, *Dynatek*, and *Sleeman* in Ground 1A (addressed in his paragraphs 265-274) and *Waldner*, *Dynatek*, and *Auld* in Ground 3 (addressed in his paragraphs 313-326). Nowhere does Solaris or Dr. Durham address combining all four references together.

Like Ground 2A, Ground 3A next provides its entire argument about the results of the combination in one conclusory sentence: “*Waldner* in view of *Dynatek*, *Sleeman*, and *Auld* renders Claims 3, 12, 21, and 25 obvious.” (Paper 1, p. 91.) None of the support cited for that sentence provides any analysis of the combination of *Waldner*, *Dynatek*, *Sleeman*, **and** *Auld*.

The Board should reject Ground 3A because the Petition fails to articulate how this combination renders claims 3, 12, 21, and 25 obvious. To the extent the

Board substantively considers Ground 3A, it fails for the same reasons as Grounds 1A and 3. (Ex. 2004, ¶¶167-168; *supra* sections V, VIII.)

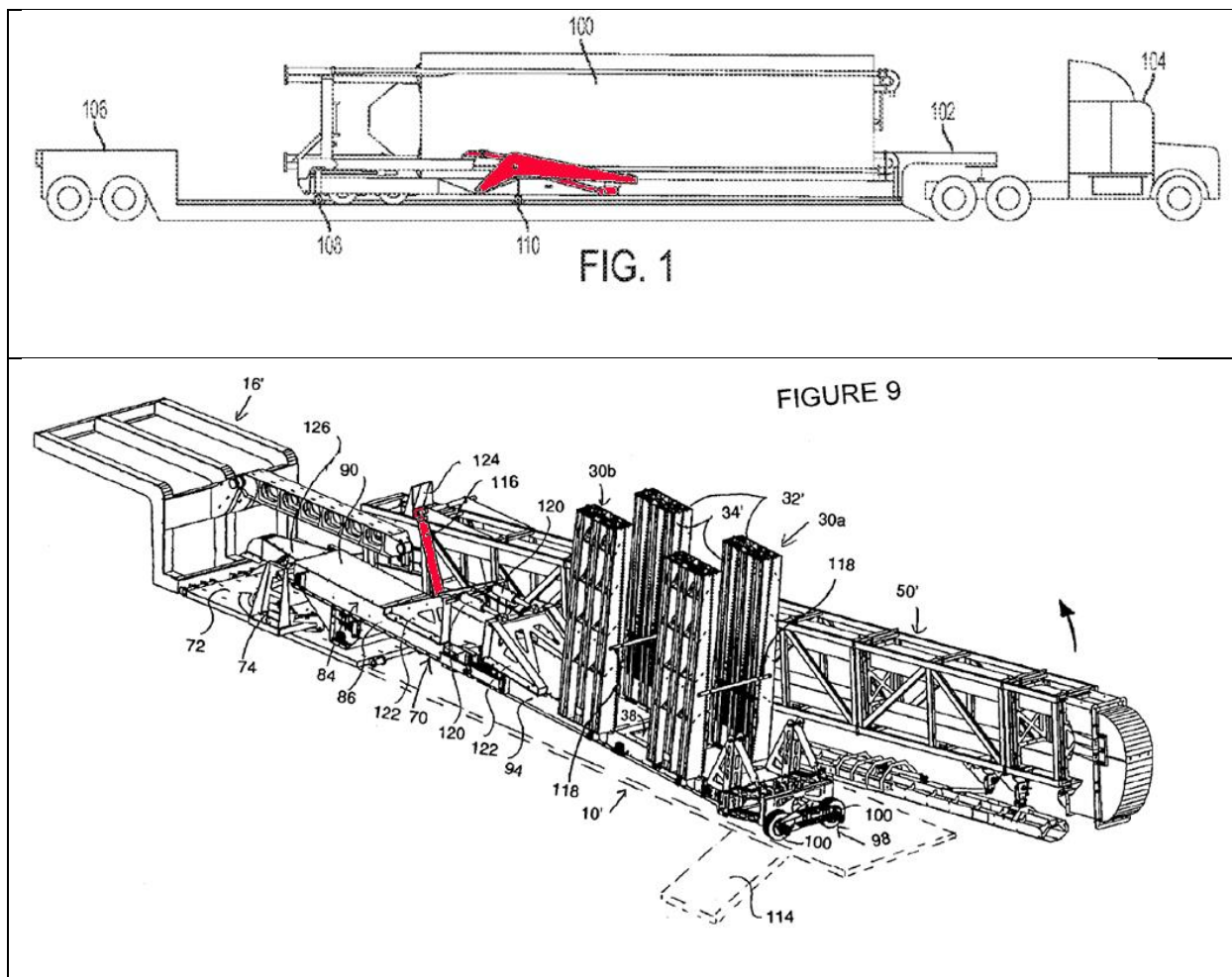
X. GROUND 4: Solaris Has Failed to Prove Obviousness of Claims 13-15 Based on *Waldner*, *Dynatek*, and *McIver*

A. Ground 4 Fails for the Same Reasons That Ground 1 Fails for Claim 1

Ground 4 argues that claims 13-15 would have been obvious based on *Waldner*, *Dynatek*, and *McIver*. (Paper 1, pp. 91-96.) But Ground 4 fails for the same reasons as Ground 1 fails for claim 1. Claim 13 contains limitations 1[h], 1[i], and 1[j] in limitations 13[h], 13[i], 13[j]. Solaris does not rely on *McIver* to cure any of the defects in its Ground 1 arguments, relying instead on the *Waldner/Dynatek* combination from Ground 1 for claim 1 to satisfy limitations 13[h], 13[i], and 13[j]. (Paper 1, p. 93.) For all the reasons that Ground 1 fails for claim 1, Ground 4 fails for claim 13 (and its dependent claims 14-15). (Ex. 2004, ¶169.)

B. Ground 4 Fails for Additional Reasons

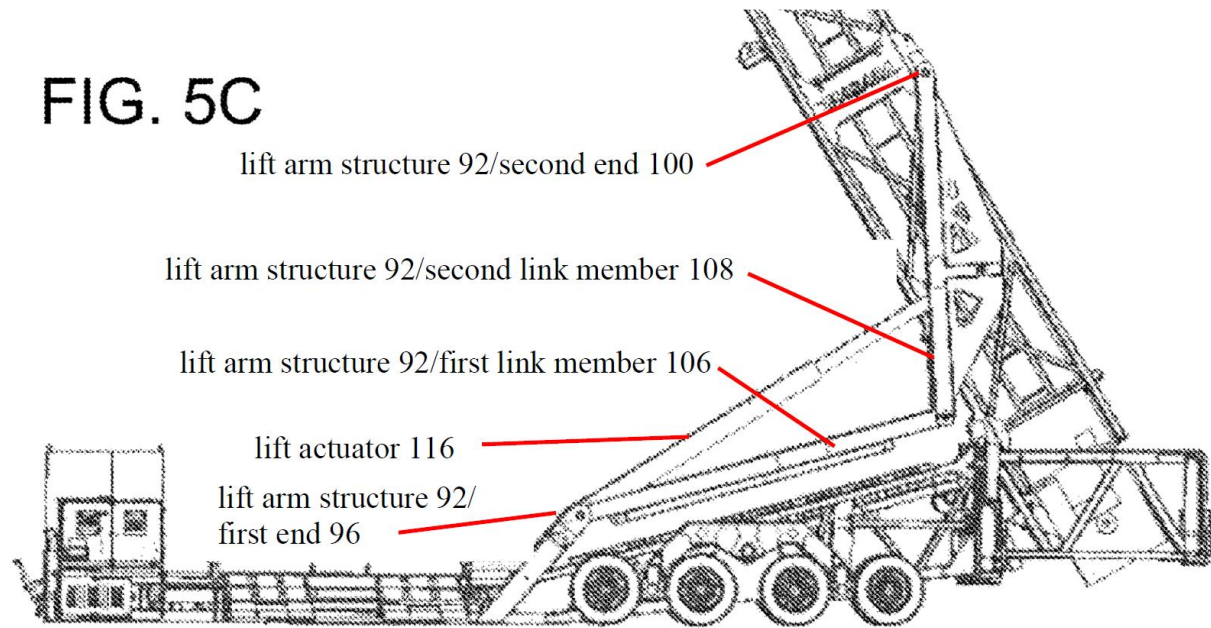
Ground 4 also fails for additional reasons. Solaris argues that a POSITA would have substituted *McIver*'s actuator 202 and arms 204/206 for *Waldner*'s cylinders 116 because the resulting combination with *McIver*'s configuration would be "more compact." (Paper 1, pp. 92, 93.) But comparing Figure 1 of *McIver* to Figure 9 of *Waldner* shows that *McIver*'s configuration is **not** "more compact":



(Ex. 2004, ¶172.) *McIver*’s actuators and *Waldner*’s cylinders are each located to the side of a silo/bucket elevator, respectively, and neither extends vertically above those other components. Therefore, Solaris’s reasons for combining *McIver* with *Waldner* and *Dynatek* do not withstand scrutiny.¹²

¹² The broad, general similarities that Solaris argues qualify *McIver* as “analogous art” (Paper 1, p. 91) do not provide a motivation for cherry picking the specific features from *Waldner*, *Dynatek*, and *McIver* that Solaris selects for claim 13. (Ex. 2004, ¶¶169-171.) In addition, other potential “motivations” offered by Dr. Durham but not presented in Solaris’s petition should not be considered but fail in any event for the reasons provided by Mr. Anderson. (*Id.*, ¶173.)

Solaris also fails to show that *McIver* satisfies limitation 13[1]. That limitation requires “the at least one lift arm structure ***being articulated*** between opposite first and second ends of the arm structure.” (Ex. 1001, 20:23-25.) Annotated Figure 5C below shows these structures and the relevant “articulation” in the ’689 Patent:



(Ex. 2004, ¶175.) Lift arm structure 92 comprises first link member 106 and second link member 108 that pivot with respect to each other such that lift arm structure 92 is “articulated” between its first end 96 and its second end 100. (See Ex. 1001, 8:57-64; Ex. 2004, ¶175.) Thus, “articulated” as used here means “being comprised of two connected parts that move relative to one another.” (Ex. 2004, ¶175.)

To show that *McIver* satisfies the “articulated” limitation, Solaris cites paragraphs 394-395 of Dr. Durham’s declaration. (Paper 1, p. 95.) According to Dr. Durham, *McIver* discloses that actuator 202 “appl[ies] a force between the ends of

the rocker arm 204 and *that rocker arm is articulated* between opposite first and second ends of the arm structure.” (Ex. 1003, ¶394.) But *McIver*’s rocker arm 204 is one integral structure, not two connected structures that move relative to one another. (Ex. 2004, ¶175; Ex. 1011, Fig. 2.) Therefore, Solaris has failed to show that *Waldner*, *Dynatek*, and *McIver* satisfy claim 13 even if combined. (Ex. 2004, ¶176.)

XI. GROUND 4A: Solaris Has Failed to Prove Obviousness of Claims 13-15 Based on *Waldner*, *Dynatek*, *Sleeman*, and *McIver*

As with Grounds 2A and 3A, Ground 4A is conclusory and unsupported. Ground 4A again refers to a non-existent “§VII.A.2.a)1.” (Paper 1, p. 100.) Then, providing no analysis, Solaris merely cites Dr. Durham’s declaration at paragraphs 402-403, 111-121, 265-274, and 369-377. (*Id.*) But paragraphs 402-403 merely assert that a POSITA would have combined *McIver* with *Waldner*, *Dynatek*, and *Sleeman* for the same reasons as *Waldner*, *Dynatek*, and *Sleeman* in Ground 1A (addressed in his paragraphs 265-274) and *Waldner*, *Dynatek*, and *McIver* in Ground 4 (addressed in his paragraphs 369-377). Nowhere does Solaris or Dr. Durham address combining all four references together.

Like Grounds 2A and 3A, Ground 4A asserts in one conclusory sentence: “*Waldner* in view of *Dynatek*, *Sleeman*, and *McIver* renders Claims 13-5 obvious.” (Paper 1, p. 101.) None of the support cited for that sentence provides any analysis of the combination of *Waldner*, *Dynatek*, *Sleeman*, **and** *McIver*.

The Board should reject Ground 4A because the Petition fails to articulate how this combination renders claims 13-15 obvious. To the extent the Board substantively considers Ground 4A, it fails for the same reasons as Grounds 1A and 4. (Ex. 2004, ¶¶177-180; *supra* sections V, X.)

XII. The Objective Evidence Confirms That There Was No Obviousness

If there were any question that Solaris's case for obviousness should be rejected, the objective evidence of nonobviousness confirms it.

As explained above, Solaris had a need for the claimed invention, engaged Masaba to design a solution to fill that need while explaining how important it was to Solaris, was skeptical about using the bucket elevator that Masaba eventually used in the claimed invention, and effusively praised the Masaba machine after it was first built and tested. (Ex. 2005, ¶¶2-19; Ex. 2006, ¶¶2-9.) Solaris then took delivery of that machine and made dozens of copies of it, all while informing its investors that those units were the driving force behind amazing increases in Solaris's financial performance. (Ex. 2005, ¶¶21-24; Exs. 2007-2030.) Solaris also convinced the USPTO (without disclosing the Masaba machine) that the invention is novel and not obvious to obtain its own patent on the same system. (Ex. 2031.) Now, Solaris wants the Board to believe that the same invention that it commissioned Masaba to invent—and that it has praised, copied, profited from, and patented—was obvious all along.

However, the real-world facts are often “the most probative and cogent evidence in the record.” *Stratoflex, Inc v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). The objective evidence “may often establish that an invention appearing to have been obvious in light of the prior art was not. It is to be considered as part of all the evidence, not just when the decisionmaker remains in doubt after reviewing the art.” *Id.* Here, the real-world facts are more than “probative and cogent” evidence of nonobviousness. They are compelling.

First, Solaris’s skepticism of bucket elevators—which Solaris attributed to the entire “oil field” industry—is probative of nonobviousness in this case. *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F.2d 720, 726 (Fed. Cir. 1990) (explaining that an infringer’s skepticism was “relevant and persuasive evidence” of nonobviousness); *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1335 (Fed. Cir. 2016) (“Evidence of industry skepticism weighs in favor of non-obviousness.”).

Likewise, Solaris’s copying is also probative of nonobviousness. *Kurtz v. Belle Hat Lining Co.*, 280 F. 277, 281 (2d Cir. 1922) (“[T]he imitation of a thing patented by a defendant, who denies invention, has often been regarded...as conclusive evidence of what the defendant thinks of the patent, and persuasive of what the rest of the world ought to think.”); *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 1099 (Fed. Cir. 1985) (“That [defendant], a large corporation with

many engineers on its staff, did not copy any prior art device, but found it necessary to copy the [patentee's product], is...strong evidence of nonobviousness.”).

The fact that Solaris praised the Masaba machine and has praised its copycat Top Fill system to its investors is also probative of nonobviousness, as is the Top Fill system's commercial success. *Power-One, Inc. v. Artesyn Technologies, Inc.*, 599 F.3d 1343, 1352 (Fed. Cir. 2010); *WBIP*, 829 F.3d at 1337.

And finally, the fact that Solaris filed its own patent application covering what is claimed in the '689 Patent is also probative of nonobviousness. *American Medical Systems Inc. v. Medical Engineering Corp.*, 794 F. Supp. 1370, 1386 (E.D. Wis. 1992), *aff'd in part, rev'd in part & remanded*, 6 F.3d 1523 (Fed. Cir. 1993); *Polaroid Corp. v. Eastman Kodak Co.*, 641 F. Supp. 828, 848 (D. Mass. 1985), *aff'd*, 789 F.2d 1556 (Fed. Cir. 1986).

Solaris's Top Fill machines are copies of Masaba's machine and—not surprisingly—it is apparent that they both satisfy the requirements of every claim of the '689 Patent discussed in this response. (*Compare* Ex. 1001, 16:14-24:63 with Exs. 2007, 2008, 2011, 2025-2030, 2005 ¶¶17-21; *see also* Ex. 2037 (Exhibit 9).) Because Masaba's machine and Solaris's Top Fill machines embody those claims, there is a presumption of a nexus between all the foregoing objective considerations and the claimed invention. *PPC Broadband, Inc. v. Corning Optical Communications RF LLC*, 815 F.3d 734, 747 (Fed. Cir. 2016); *WBIP*, 829 F.3d at

1329-31. Given this presumption, Solaris must prove that the commercial success, praise, skepticism, and copying are solely due to something else. *Ecolochem, Inc. v. Southern California Edison Co.*, 227 F.3d 1361, 1378 (Fed. Cir. 2000).

XIII. Conclusion

Solaris has not proven that claims 1-25 are unpatentable for obviousness.

DATED this 28th day of April, 2025.

Respectfully submitted,

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WORD COUNT CERTIFICATION

Pursuant to 37 C.F.R. § 42.24(d), I hereby certify that, according to the word-processing system used to prepare it, the foregoing **Patent Owner's Response Under 37 C.F.R. § 42.120**, is 13,990 words in length, excluding those portions exempted by 37 C.F.R. § 42.24(a).

/Chad Nydegger/

Chad E. Nydegger, Reg. No. 61,020

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6, I hereby certify that on this 28th day of April, 2025, I caused the foregoing **Patent Owner's Response Under 37 C.F.R. § 42.120 (and Exhibits 2001-2037)** to be served via email, on the following counsel of record for Petitioner at the email addresses below:

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