

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,
Petitioner,

v.

MASABA, INC.,
Patent Owner.

IPR2024-01179
Patent 11,780,689 B1

Before JAMES A. TARTAL, CARL M. DEFRANCO, and
ROBERT L. KINDER, *Administrative Patent Judges*.

DEFRANCO, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying Patent Owner's Motion to Strike
Denying Petitioner's Motion to Exclude
35 U.S.C. § 318(a)

Masaba, Inc. (“Masaba”) is the owner of U.S. Patent No. 11,780,689 B1 (Ex. 1001, “the ’689 patent”). Solaris Oilfield Site Services Operating, LLC, and Solaris Oilfield Site Services Personnel, LLC (collectively, “Solaris”) filed a petition for *inter partes* review of claims 1–25 of the ’689 patent. *See* Paper 1 (“Pet.”). We instituted *inter partes* review of all the claims as challenged in the petition. Paper 7 (“Inst. Dec.”). Masaba, in due course, filed a patent owner response. Paper 13 (“PO Resp.”). Solaris followed with a reply. Paper 20 (“Pet. Reply”). And Masaba followed with a sur-reply. Paper 33 (“PO Sur-Reply”).

The parties also filed motions seeking to exclude certain evidence. Masaba seeks to strike the testimony of one of Solaris’s declarants, as well as certain exhibits on which the testimony relies. Paper 30 (“Mot.”). Solaris opposes Masaba’s motion to strike. Paper 31 (“Opp.”). Solaris, for its part, seeks to exclude Masaba’s Exhibit 2037, a 95-page “Complaint” from a parallel district court infringement action. Paper 34. Masaba opposes (Paper 35), to which Solaris files a reply (Paper 36).

We have jurisdiction under 35 U.S.C. § 6. We held an oral hearing on November 13, 2025, a transcript of which is in the record. Paper 40 (“Hrg. Tr.”). This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a).

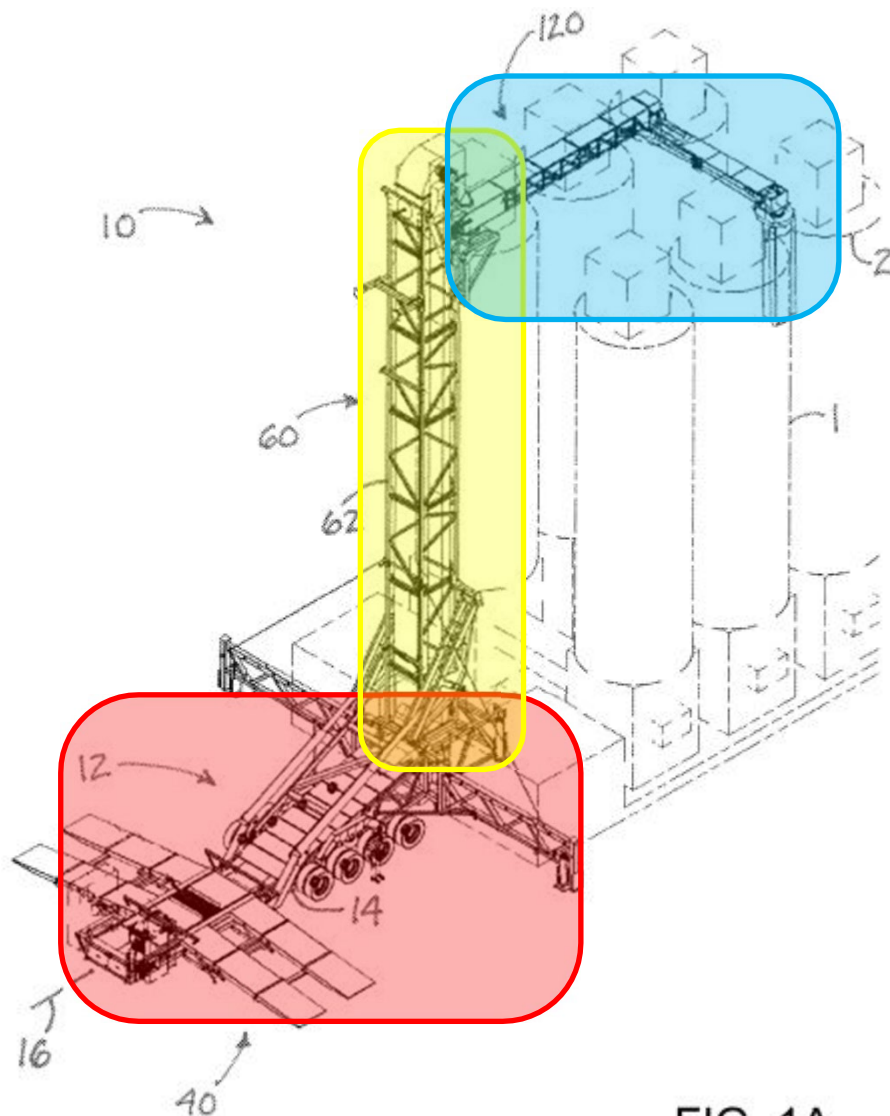
I. BACKGROUND

A. Related Matters

The ’689 patent is the subject of a parallel district court action: *Masaba, Inc. v. Solaris Oilfield Infrastructure, Inc.*, Case No. 2:23-cv-00236 (D. Wyo. Dec. 14, 2023). *See* Paper 5.

B. The '689 Patent

The '689 patent describes an apparatus for receiving aggregate (e.g., sand utilized in hydraulic fracturing of oil and gas wells) from a vehicle and elevating the aggregate for deposit into a plurality of storage silos. *See* Ex. 1001, 1:14–18. The apparatus includes three main sub-assemblies, as highlighted and reproduced below in Solaris's annotated Figure 1A of the '689 patent.



As shown above, the three sub-assemblies include (1) a base assembly (red) for receiving aggregate, (2) an aggregate elevating assembly (yellow) mounted on the base assembly and having an elevating conveyor, and (3) a conveyor extension assembly (blue) at the top of the elevating assembly with pivotable segments for discharging the aggregate into the various silos. *Id.* at 1:22–2:6.

C. Challenged Claims

Of the challenged claims, eight are independent, namely, claims 1, 12, 13, 16, 18, 22, 23, and 25. All are directed to an “aggregate transferring apparatus.” Claim 1 is illustrative and reproduced below (with Solaris’s nomenclature from the petition added for clarity):

1. An aggregate transferring apparatus for elevating and transferring aggregate, the apparatus comprising:

[1a] a base assembly for receiving aggregate to be conveyed by the transferring apparatus, the base assembly comprising:

[1b] a base frame being elongated along a longitudinal axis and having a leading end and a trailing end;

[1c] an unloader structure mounted on the base frame to receive aggregate from a vehicle at least partially positioned over the base frame; and

[1d] a base conveyor mounted on the base frame and extending along a longitudinal portion of the base frame between the leading and trailing ends of the base frame, a portion of the base conveyor being positioned adjacent to the unloader structure to receive aggregate from the vehicle positioned over the base frame;

[1e] an aggregate elevating assembly for elevating aggregate from the base assembly, the aggregate elevating assembly comprising:

[1f] a deployable frame mounted on the base frame and being movable between a storage position and a deploy position, the storage position corresponding to a transport

configuration of the apparatus and the deploy position corresponding to an operational configuration of the apparatus, the deployable frame being elongated with a base end and a free end; and

[1g] an elevating conveyor configured to receive aggregate from the base conveyor and convey the aggregate upwardly from the base assembly toward the free end of the deployable frame; and

[1h] a conveyor extension assembly for conveying aggregate to locations horizontally outward from the aggregate elevating assembly, the conveyor extension assembly comprising:

[1i] 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, the extension conveyor being movable with respect to the aggregate elevating assembly between a lowered position corresponding to the transport configuration of the apparatus and a raised position corresponding to the operational configuration of the apparatus, the lowered position being characterized by the extension conveyor being positioned adjacent to the deployable frame of the aggregate elevating assembly, the raised position being characterized by the extension conveyor being positioned generally away from the deployable frame of the aggregate elevating assembly,

[1j] wherein the extension conveyor is articulated between the inlet and outlet with an inboard segment and an outboard segment, the inboard segment being pivotally connected to the deployable frame of the aggregate elevating assembly by an inboard pivot, the outboard segment being pivotally connected to the inboard segment by an outboard pivot; and

[1k] wherein the inboard segment of the extension conveyor of the conveyor extension assembly is pivotable at the inboard pivot about a substantially vertical axis with respect to the deployable frame at the inboard pivot when the extension conveyor is in the raised position, the outboard segment of the extension conveyor being pivotable at the outboard pivot about a substantially vertical axis with respect

to the inboard segment when the extension conveyor is in the raised position.

Ex. 1001, 16:14–17:13; *see also* Ex. 1013 (Solaris’s claim listing).

D. Asserted Challenges

Ground	Claims Challenged	35 U.S.C. §	Basis
1	1, 2, 4–11, 16–20, 22–24	103	Waldner, ¹ Dynatek ²
1A	1, 2, 4–11, 16–20, 22–24	103	Waldner, Dynatek, Sleeman ³
2	6, 7	103	Waldner, Dynatek, Pham ⁴
2A	6, 7	103	Waldner, Dynatek, Pham, Sleeman
3	3, 12, 21, 25	103	Waldner, Dynatek, Auld ⁵
3A	3, 12, 21, 25	103	Waldner, Dynatek, Auld, Sleeman
4	13–15	103	Waldner, Dynatek, McIver ⁶
4A	13–15	103	Waldner, Dynatek, McIver, Sleeman

¹ US 9,663,303 B2, issued May 30, 2017 (Ex. 1004, “Waldner”).

² DYNATEK ARTICULATED LOADING SYSTEMS, *EconoLoader™ – Belt Conveyor Design* (August. 19, 2016), at <https://web.archive.org/web/20160819111857/http://mcschroeder.com/wp-content/uploads/2012/09/Product-Spec-Sheet-Belt-EconoLoader.pdf> (Exs. 1005, 1014, collectively “Dynatek”).

³ US 11,691,831 B2, issued July 4, 2023 (Ex. 1006, “Sleeman”).

⁴ US 10,633,174 B2, issued Apr. 28, 2020 (Ex. 1008, “Pham”).

⁵ US 3,090,501, issued May 21, 1963 (Ex. 1009, “Auld”).

⁶ US 8,926,252 B2, issued Jan. 6, 2015 (Ex. 1011, “McIver”).

In further support of these challenges, Solaris submits the declarations of Robert A. Durham, Ph.D (Exs. 1003, 1110), David Smith (Ex. 1111),⁷ and Jeremy Weinstein (Ex. 1112). In rebuttal, Masaba submits the declarations of Travis A. Anderson (Ex. 2004), Dan Brinkman (Ex. 2005), and Mike Stanton (Ex. 2006).

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Solaris proposes that one of ordinary skill in the art in the relevant time frame would have had:

a degree in mechanical, electrical, petroleum, or civil engineering and with at least two years' experience working in an industry or field that involves handling of particulate materials, which may include operations in the oil and gas industry that involve the handling of such materials.

Pet. 14 (citing Ex. 1003 ¶41). In granting institution, we adopted Solaris's proposed definition because it appeared consistent with the asserted prior art and the specification of the '689 patent. *See* Inst. Dec. 6–7.

In response, Masaba argues that Solaris's declarant, Dr. Durham, “does not possess the minimum skill level for the '689 patent” and his testimony should be given “no weight” because his degrees and experience “do not qualify him to testify here.” *See* PO Resp. 22–23. According to Masaba, one of ordinary skill in the art would have had:

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.

Id. at 25 (citing Ex. 2004 ¶ 27).

⁷ We do not rely on Mr. Smith's declaration testimony.

As for other types of engineering degrees, Masaba contends that 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. (citing Ex. 2004 ¶ 28). Masaba also contends 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.* (citing Ex. 2004 ¶ 29).

With that skill level in mind, Masaba argues that Dr. Durham lacks the minimum skill level needed to evaluate the ’689 patent because his undergraduate degree is in electrical engineering and “nothing” associated with his other degrees (a Master’s in “Technology Management” and a Ph.D. in “Engineering Management”) address “the engineering challenges associated with *conveying aggregate materials*.” *Id.* at 23 (emphasis added). Masaba also argues that, despite having experience in the “oil and gas industry,” Dr. Durham’s experience did not involve “*aggregate transferring systems in any capacity*,” nor was he involved in the design, construction, or selection of “*structural or mechanical components*” for those systems. *Id.* at 23–24 (emphasis added).

We disagree that Dr. Durham does not possess the necessary level of skill in the art to qualify as an expert in this case. Looking at the specification of the ’689 patent and the prior art of record, we think Masaba sets the bar too high. We acknowledge that one of ordinary skill in the art should have some education and/or experience in the mechanical art of conveying aggregate materials, but we do not think opining on the ’689

patent and asserted prior art necessarily requires that person to have the amount of education and experience that Masaba advocates.

The '689 patent relates generally to an “aggregate transferring system for receiving aggregate from a vehicle and elevating the aggregate to a higher vertical level for deposit into, for example, a silo.” Ex. 1001, 1:15–18. And, as described in the '689 patent and discussed later, the transferring system is an assembly of *known* types of conveyors, such as a belly-dump truck conveyor, a bucket elevator, and an articulated belt conveyor, for transferring the aggregate horizontally and vertically from a belly-dump truck to the discharge point, such as a silo. Without doubt, Dr. Durham has enough education and experience to reliably opine on the combination of known parts.

For instance, although the brunt of his electrical engineering curriculum was not mechanical in nature, Dr. Durham nonetheless took courses in “statics” and “instrumentation” that addressed various “mechanical engineering challenges” and “structural issues,” albeit only generally related to conveying aggregate materials. *See* Ex. 2003, 6:20–8:19. More importantly, however, Dr. Durham detailed his considerable experience over the years with aggregate conveying systems—

Q. [by Masaba counsel] You worked at South Central West from approximately 1989 to 2000, correct? . . .

A. [by Dr. Durham] Yes, Central and Southwest.

Q. Do [sp.] you work on any conveyor systems for aggregates essential to Southwest?

A. Yes.

Q. And can you explain to me your experience there?

A. Yes, *I was dealing with control systems for conveying system, conveying coal into a silo for coal storage and grinding in the coal power plant.*

Q. And what specifically was your responsibility in connection with those systems?

A. Control systems design. *So in control system design, you have to understand the entire operating system in order to design the control system properly.* Speed control, volume control, we have different ways that the operators could operate that, fairly new at the time.

Q. Okay. So [i]t was more on the -- was it fair to say it was more on the electronical side of the controls? [Objection posed].

A. No, physical controls as well in the field. . . . *Physical control and the speed of the conveyors, physical controlling or measuring the volume, those kind of things.*

Q. Okay. And how much of your time was spent in connection with those conveyor systems?

A. I think that probably was a four- or five-month project, something like that.

* * *

Q. Okay. And then you worked at New Dominion, LLC, from 2000 to 2002, correct?

A. Correct.

Q. And at New Dominion, LLC, did you work on any conveyor systems for aggregates?

A. No, *I obviously saw them regularly at the fracturing sites and understood how they worked clearly.* But, no, I didn't physically work on them.

* * *

Q. Okay. And in connection with your work at THEWAY Corp. [from 2004 to 2022], have you worked on any conveyor systems for aggregates?

A. *I've worked with fracturing systems again dozens of times over those years. Physically handling the conveyors, no. That's generally, as you know, a service company project. But I've witnessed them. I understand how they operate in the field. I've had to interface with the operator of them -- sorry, the service companies and seeing those operate. Like I said, many times over those years, but I don't physically work on much anymore.*

Ex. 2003, 9:15–12:12 (emphases added).

As shown by Dr. Durham’s testimony, his experience with conveyor systems in the oil fracturing (a.k.a. “fracking” or “fracing”) industry, which invariably involves handling aggregate material, runs from 1989 to at least 2022, a span of thirty-plus years. And, to the extent Masaba attempts to discredit Dr. Durham’s experience in the oil fracking industry as involving nothing more than “designing controls,” we are not persuaded. *See* PO Resp. 24, 26. That is because the ’689 patent itself speaks *at length* to “a control assembly 170” for “providing control and monitoring” of the deployment and operation of the various conveyor assemblies, including the base conveyor, the elevating conveyor, and the extension conveyor. *See* Ex. 1001, 3:44–46, 12:16–13:64, Fig. 9; *see also* Pet. Reply 2 (citing essentially same). Masaba ignores that critical disclosure in the ’689 patent in its attempt to disqualify Solaris’s expert.

Based on our review of the record, Dr. Durham satisfies the “approximately 4–6 years of hands-on experience” in “engineering aggregate handling equipment” that Masaba advocates for one to be considered as having the ordinary level of in the art of the ’689 patent. As such, we find that Dr. Durham possesses the necessary qualifications to provide expert testimony here. That Masaba’s expert may possess better qualifications than Dr. Durham does not, without more, necessarily disqualify Dr. Durham from being an expert in this case or otherwise render his testimony any less reliable.

B. Claim Construction

Solaris contends that an express construction of the claim terms is “not required . . . because the prior art invalidates the claims under any plausible construction.” Pet. 24. Alternatively, “[t]o the extent Patent

Owner asserts” that two claim terms—“unloader structure” and “trailer structure”—should be construed as means-plus-function limitations under 35 U.S.C. § 112(f), Solaris submits an express construction detailing the corresponding structure in the specification for performing the recited function of the claimed unloader and trailer structures. *See id.* at 24–25.

Only in disputing Solaris’s Ground 3 does Masaba advocate that the claim term “trailer structure” should be construed under § 112(f), and then only in conjunction with dependent claims 3 and 21. *See* PO Resp. 58. As such, we address Masaba’s proposed construction in our analysis of Ground 3. We now turn to Solaris’s grounds of unpatentability.

C. Ground 1—Obviousness Over Waldner and Dynatek (Claims 1, 2, 4–11, 16–20, and 22–24)

Solaris challenges claims 1, 2, 4–11, 16–20, and 22–24 as obvious over Waldner and Dynatek. *See* Pet. 25–63. Of those claims, claims 1, 16, 18, 22, and 23 are independent. We focus on claim 1, as Masaba does not argue the independent claims separately. *See* PO Resp. 42–43, 48 (“Ground 1 Fails for Claims 2, 4–11, 16–20, and 22–24 for the Same Reasons That It Fails for Claim 1” with “Additional Reasons” only for dependent claims 6 and 7). We address dependent claims 6 and 7 separately.

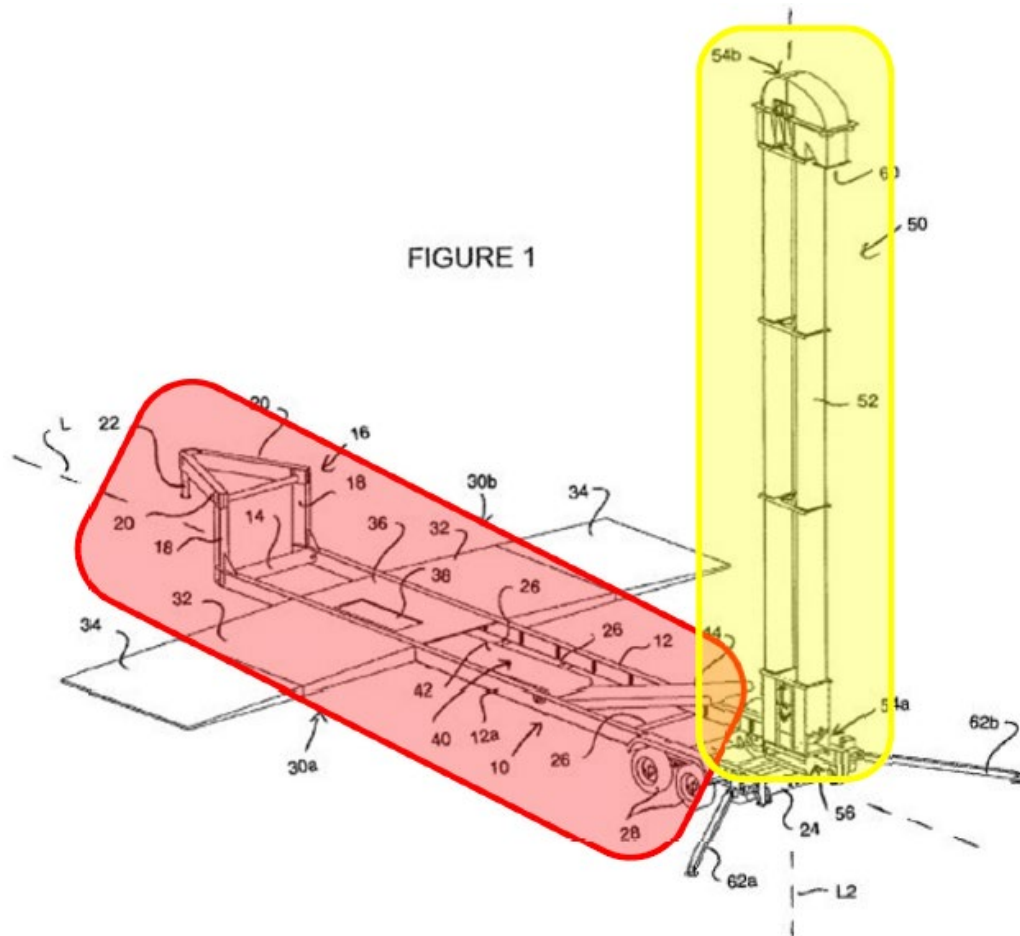
Solaris relies on Waldner for disclosing claim elements 1[a]–1[i] (Pet. 28–42) and on both Waldner and Dynatek for disclosing claim elements 1[j] and 1[k] (*id.* at 43–46). At the outset, we note that Masaba does not dispute Solaris’s showing that Waldner discloses claims elements 1[a]–1[g], nor does it dispute that Dynatek discloses claim elements 1[j] and 1[k]. *See* PO Resp. 27–29. Rather, Masaba argues, *first*, that Waldner fails to disclose claim elements 1[h] and 1[i] (*see id.* at 27), and, *second*, that Waldner fails to disclose claim elements 1[j] and 1[k] (*see id.* at 29). As

discussed below, the first argument is unpersuasive, and the second argument makes the fatal mistake of focusing solely on Waldner when, in fact, Solaris relies on the *combination* of Waldner and Dynatek for disclosing claim elements 1[j] and 1[k]. *See* Pet. 43–46. Significantly, nowhere do we discern that Masaba ever disputes that the *asserted combination* of Waldner and Dynatek discloses all the elements of claim 1, i.e., claim elements 1[a]–1[k]. *See* PO Resp. 27–29 (disputing only *Waldner’s* disclosure of elements 1[h]–1[k]). Masaba’s *third* argument, on which they spend the brunt of their time, faults Solaris’s reasoning for the combination of Waldner and Dynatek. *See id.* at 29–41. That argument, as discussed below, falls short under the full weight of the evidence.

We begin with Solaris’s showing of how Waldner and Dynatek, either individually or in combination, disclose each of the claim elements before turning to Masaba’s primary argument regarding Solaris’s alleged failure to articulate a sufficient reason to combine Waldner and Dynatek with a reasonable expectation of success in arriving at the claimed invention. Although it is undisputed that, when combined, Waldner and Dynatek together disclose all the elements of claim 1, we think it wise to review Solaris’s showing for each claim element, as it indicates the overall strength of the asserted combination.

1. Claim Elements 1[a]–1[g]

Solaris proffers annotated Figure 1 of Waldner, reproduced below, to show its disclosure of claim elements 1[a]–1[g]. *See* Pet. 28–39 (citing Ex. 1004).



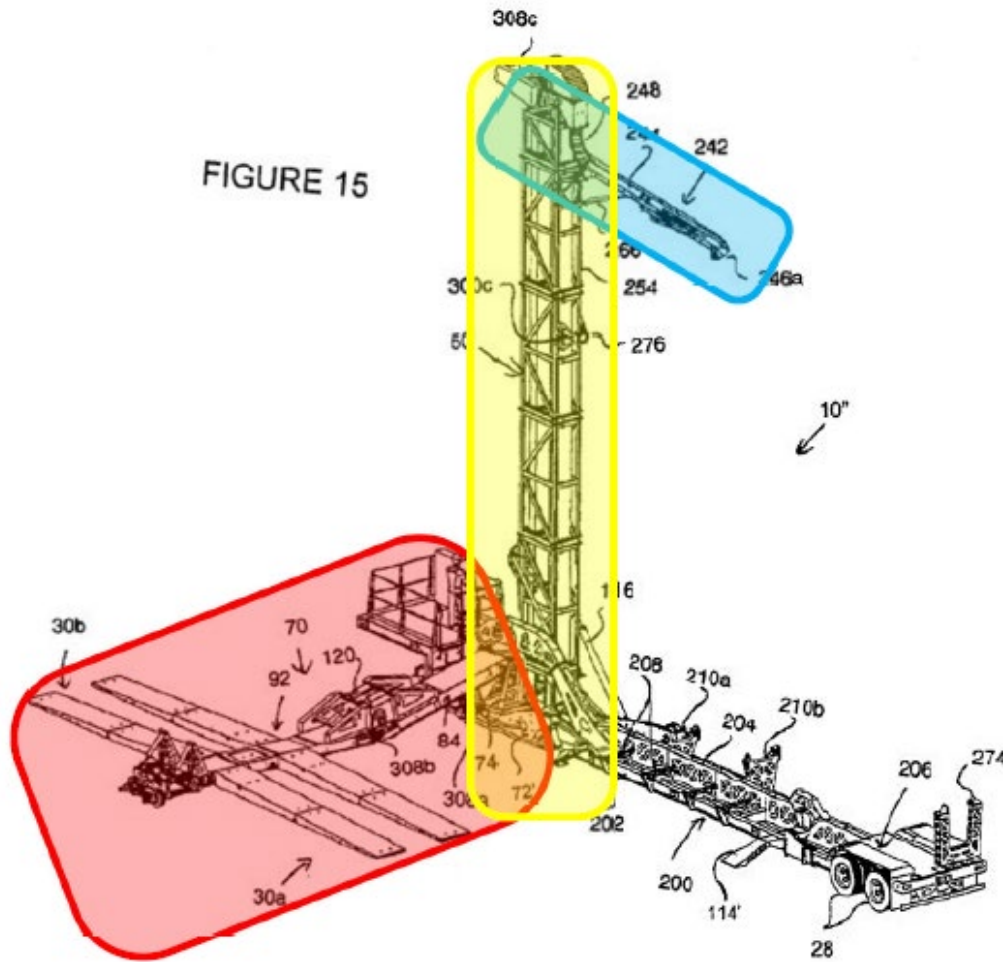
As shown, annotated Figure 1 of Waldner depicts an embodiment of a mobile aggregate transferring apparatus, where the transferring apparatus includes: (1) base conveyor assembly 40 (red) for receiving and conveying aggregate by means of conveyor belt 42; and (2) bucket elevator assembly 50 (yellow), which includes deployable frame 52 and pivotal connection 56 for deploying the bucket elevator assembly from a lowered storage position to an upright operational position. *See* Ex. 1004, 13:51–14:46. More specifically, bucket elevating assembly 50 (yellow) receives aggregate from base conveyor assembly 40 (red), where aggregate has been deposited onto conveyor belt 42 through opening 38, and conveys it upwards to outlet port 60. *Id.* at 16:37–47. “From the outlet port 60, the granular material is fed into the storage bin or tank that is to be filled with the granular material, for

example *via a discharge chute if provided.*” *Id.* at 16:47–50 (emphasis added). Based on those express disclosures, Waldner indisputably satisfies claim element 1[a]–1[g].⁸

2. *Claim Elements 1[h] and 1[i]*

With that last passage from Waldner in mind, Solaris points to Waldner’s Figure 15 embodiment, as reproduced below, to meet claim element 1[h], which recites “a conveyor extension assembly for conveying aggregate to locations horizontally outward from the aggregate elevating assembly.” *See* Pet. 39–40.

⁸ During prosecution of the ’689 patent, the Examiner likewise found that Waldner discloses claim elements akin to elements 1[a]–1[g] here. *See* Ex. 1012, at 92. For teaching the remaining ones, i.e., elements 1[h], 1[i], 1[j], and 1[k], the Examiner relied on a different reference than the Dynatek reference asserted here.



As shown and described, Waldner’s Figure 15 embodiment depicts “some modifications and additions” to its Figure 1 embodiment (Ex. 1004, 21:14–27), which include adding discharge chute member 242 (blue) in keeping with Waldner’s earlier reference to the aggregate being fed into a storage bin “via a discharge chute if provided” (*id.* at 16:47–50).

Importantly, Solaris notes Waldner’s disclosure that:

Although not shown for the first embodiment, a discharge chute may be coupled to the outlet port 60 of the bucket elevator and have an actuator, such as a hydraulic cylinder, that is operable to move a discharge end of the chute relative to the outlet port 60 of the bucket elevator. This way, an operator can adjust the point of final discharge of granular or particulate material from the system without having to move the trailer.

Pet. 39 (citing Ex. 1004, 15:14–21 (emphases added)).⁹ Solaris also notes Waldner’s disclosure that discharge member 242 can be swung “horizontally to a desired position radiating outwardly away from the bucket elevator, as shown in FIG. 15,” and, “thus carefully aim[ed]. . . at a target destination, such as the fill port of a storage bin.” *Id.* at 40 (citing Ex. 1004, 26:46–63). Based on those express disclosures, we find that Waldner’s discharge chute 242 is clearly “a conveyor extension assembly” that conveys aggregate “to locations horizontally outward from the aggregate elevating assembly,” as recited by claim element 1[h].

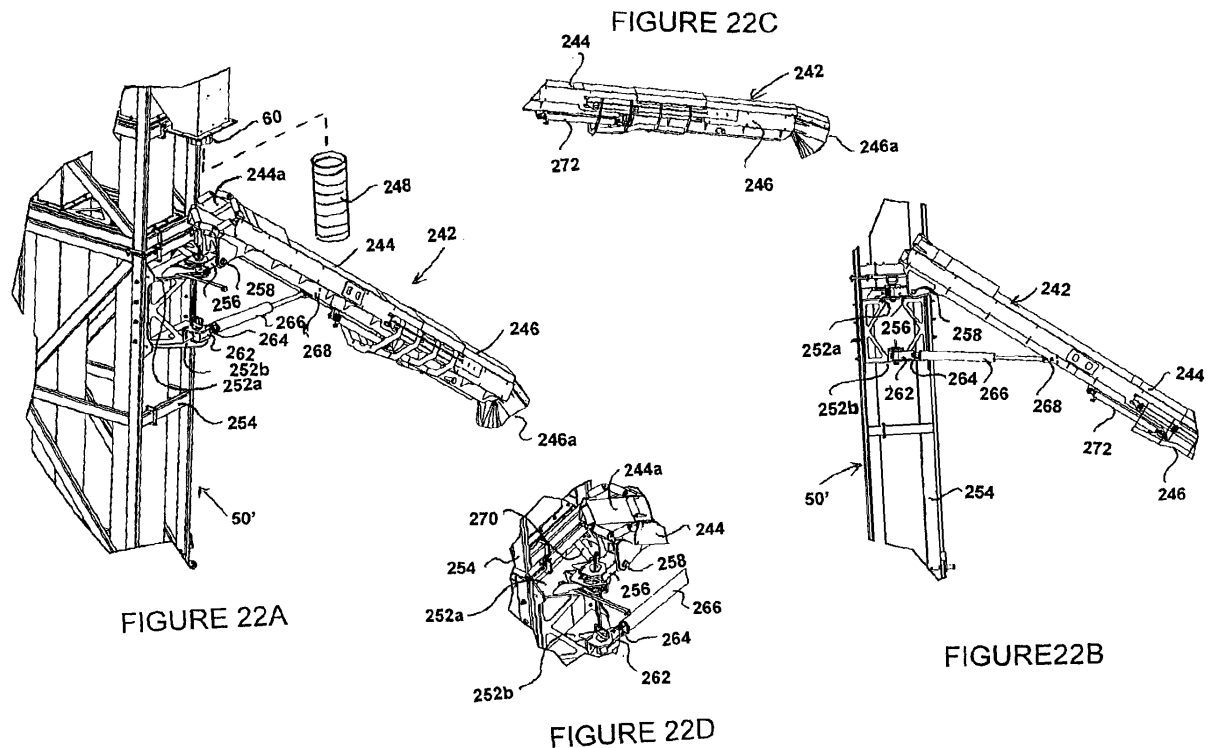
In addition, Solaris relies on Waldner’s Figure 16 to satisfy claim element 1[i]’s requirement that the conveyor extension assembly be moveable “between a lowered position corresponding to the transport configuration of the apparatus and a raised position corresponding to the operational configuration of the apparatus between a lowered position,” as recited by claim element 12[i]. *See* Pet. 41–42 (citing Ex. 1004, 25:7–66, 26:46–63, Figs. 16, 22A–22D). As shown earlier, annotated Figure 15 of Waldner depicts discharge chute 242 (blue) in a raised position relative to elevator assembly 50' (yellow), while annotated Figure 16, reproduced below, depicts discharge chute 242 (blue) in a lowered storage position adjacent to the elevator assembly 50' (yellow). *See* Ex. 1004, 11:30–31, 26:20–25.

⁹ To be clear, there is no dispute that Waldner’s “first embodiment,” as referenced in this passage, refers to the Figure 1 embodiment that Solaris relies on earlier for disclosing claim elements 1[a]–1[g].



As shown above and described by Waldner, “when the bucket elevator is lowered into the storage position, the collapsed discharge member 242 resides in a space between the bucket elevator 50' and the trailer so as to overlies the rear end of the open trailer framework 200 and the wheeled rear truck 206 connected thereto.” *Id.* at 26:20–25.

Solaris also relies on Waldner’s Figure 22A–22D, reproduced below, to show how Waldner’s discharge chute 242 is connected to and pivotable about elevator assembly 50’. *See* Pet. 39–42 (citing Figs. 22A–22D, 25:7–66, 25:66–26:19).



As shown and described by Waldner, discharge member 242 is connected to frame 254 of the elevator assembly through a series of mounting brackets, pivot pins, and hydraulic actuators. Ex. 1004, 25:20–57. As a result, “the discharge member 242 is moveable relative to the elevator frame 254 about the vertical axis . . . and also about the horizontal axis . . . [and] [a]ccordingly, the discharge end 246a of the discharge member 242 is movable *about two perpendicular axes to allow relocation thereof to various positions in 3D space.*” *Id.* at 25:58–66 (emphasis added).

Consistent with these clear and unambiguous disclosures, we find that Waldner’s discharge chute member 242 is moveable “between a lowered position . . . adjacent the deployable frame of the aggregate elevating assembly” and “a raised position . . . generally away from the deployable frame of the aggregate elevating assembly,” as recited by claim element 1[i].

Masaba’s sole response to Solaris’s showing for claim elements 1[h] and 1[i] is that Waldner’s discharge chute member 242 is not “for conveying aggregate” or “for moving aggregate,” as required by these claim elements. PO Resp. 27–29. According to Masaba, “[t]he words ‘conveying’ and ‘moving’ are transitive verbs, and ‘aggregate’ is the direct object of those verbs.” *Id.* at 28. And, relying on expert testimony, Masaba contends that one skilled in the art “would understand this language to refer to ‘a device that imparts motion to the aggregate to transport it from one point to another.’” *Id.* (citing Ex. 2004 ¶ 34). “In contrast,” according to Masaba, “‘a discharge chute is a *passive* device that does not impart motion to the aggregate’ but instead ‘merely directs the flow of the aggregate,’” and, “[w]ith Waldner’s chute, ‘it is gravity that imparts motion to the aggregate, . . . not the discharge chute.’” *Id.* (citing Ex. 2004 ¶¶ 34–35).

We reject this argument for several reasons. *First*, nowhere does the plain language of the claims specify how the aggregate is conveyed or moved from the conveyor extension assembly’s inlet to its outlet, be it passively by means of gravity *or* actively by means of a conveyor belt. Instead, the claims simply use those verbs according to their plain and ordinary meaning, which is “to transfer or deliver” or “to cause to go or pass” from one place to another. *See* Ex. 3001, 253 (defining “convey”), 760 (defining “move”).¹⁰ *Second*, the specification of the ’689 patent similarly uses these terms in a plain and ordinary sense, without ever attributing to them some sort of special meaning. *See, e.g.*, Ex. 1001, 4:9–12 (“The apparatus 10 is suitable for performing *the transfer of aggregate from*

¹⁰ We reference the original pagination of the dictionary in which these definitions appear.

one location to another, such as, for example, from a vehicle carrying the aggregate to a silo 1 for storing the aggregate.”). The ’689 patent specification also makes clear that active conveyance of the aggregate is an option and not a requirement of the claimed invention, stating that the conveyor extension assembly “*may further* include a conveyor belt 150.” Ex. 1001, 10:60–66 (emphasis added). Limiting claim elements 1[h] and 1[i] to a device “for *actively* conveying” or “for *actively* moving aggregate” would improperly import limitations from the specification into the claims. Thus, based on the intrinsic evidence, we determine that claim elements 1h and 1k are properly construed to encompass passive and/or active movement of the aggregate via the conveyor extension assembly.

Also, to the extent Masaba relies on extrinsic expert testimony, we note that Masaba’s expert cites absolutely no support for his understanding of the claims, much less explains why we should adopt his understanding over the plain and ordinary meaning of “conveying aggregate” and “moving aggregate.” See Ex. 2004 ¶ 34. Absent supporting citations, such extrinsic testimony is entitled to little, if any, weight. As such, we reject the notion that Waldner’s discharge chute member 242 is not a conveyor “for conveying aggregate” or “for moving aggregate,” as required by claim elements 1[h] and 1[i].

Moreover, we disagree with the testimony of Masaba’s expert (and his characterization of Solaris’s expert testimony) that Waldner’s discharge chute 242 is merely a “fixed tube” or “pipeline” that “does not impart motion to the aggregate within it.” Ex. 2004 ¶ 35. Clearly, Waldner discloses that discharge chute member 242 is oriented to convey and feed aggregate material from the elevator assembly to outlet 246a of the discharge chute. For instance, Waldner discloses—

- “[A]n operator *can adjust the point of final discharge* of granular or particulate material from the system without having to move the trailer.” Ex. 1004, 15:19–21 (emphasis added).
- “From the outlet port 60 [of the elevator assembly 50], *the granular material is fed into the storage bin or tank* that is to be filled with the granular material, for example via a discharge chute if provided.” *Id.* at 16:47–50 (emphasis added).
- “[T]he discharge end 246a of the discharge member 242 *is movable about two perpendicular axes* to allow relocation thereof to various positions in 3D space.” *Id.* at 25:64–66 (emphasis added).
- “[A]ctuator 270 can be used to *swing the discharge member 242 horizontally to a desired angle* radiating outwardly away from the bucket elevator, as shown in FIG. 15” and “[a]n operator can thus *carefully aim the discharge opening 246a* at the target destination, such as the fill port of a storage bin.”). *Id.* at 26:58–63 (emphasis added).

Those disclosures show it is the angular orientation of Waldner’s discharge chute member 242, and not simply gravity (a force that is always constant), that imparts motion to the aggregate so as to transfer it from one place to another. That the angular orientation of Waldner’s extension conveyor 242 is the means for imparting such motion does not exclude it from Masaba’s proposed construction.

In sum, for all the above reasons, we find that Waldner satisfies claims elements 1[h] and 1[i]. We reject Masaba’s arguments to the contrary. And, to the extent Waldner may not *fully* satisfy these particular claims elements, we note Solaris’s additional reliance on Dynatek for any such shortcomings in Waldner (*see* Pet. 40–41, 43), as discussed in the following analysis.

3. *Claim Elements 1[j] and 1[k]*

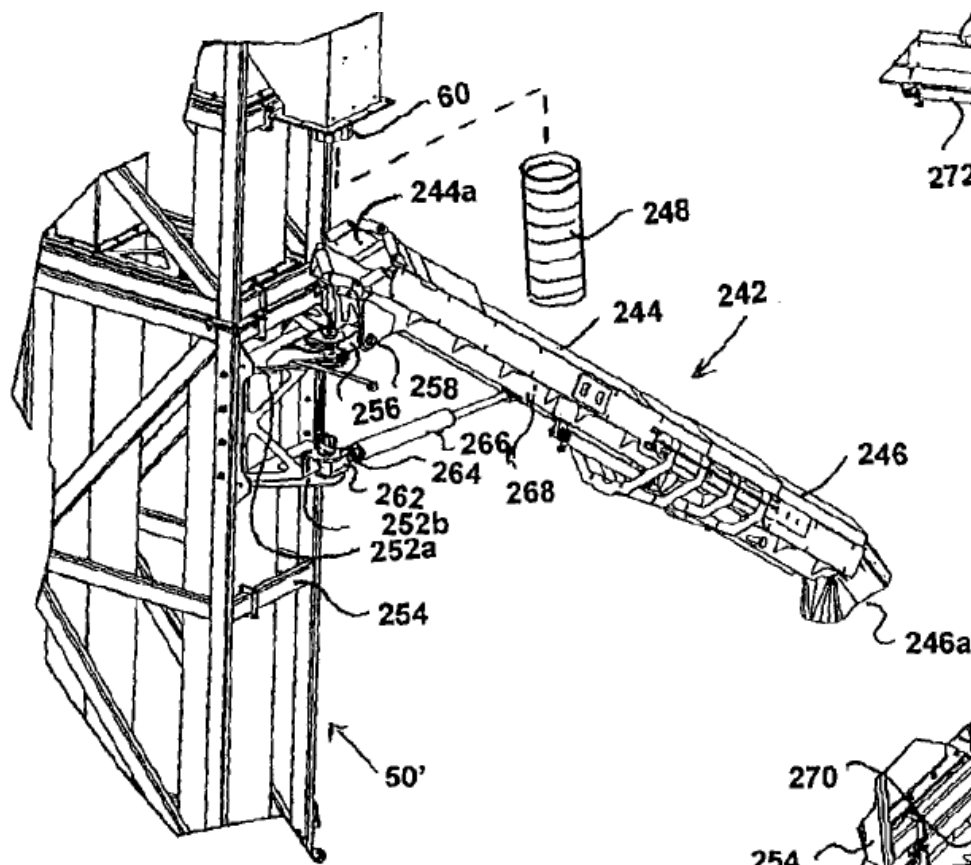
Claim element 1[j] requires that the extension conveyor have “an inboard segment and an outboard segment” that are “articulated” relative to one another, with “the inboard segment being pivotally connected to the deployable frame of the aggregate elevating assembly by an inboard pivot” and “the outboard segment being pivotally connected to the inboard segment by an outboard pivot.” Ex. 1001, 16:65–17:4. Claim element 1[k] simply adds that both the inboard and outboard pivots are “pivotable . . . about a substantially vertical axis.” *Id.* at 17:5–13.

Solaris contends that Waldner, *in combination with Dynatek*, discloses claim elements 1[j] and 1[k]. *See* Pet. 43–46 (mapping elements 1[j]–1[k] to Waldner *and* Dynatek). Masaba makes a single argument against Solaris’s showing for these claim elements, namely, that “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.’ [citation omitted] Nor does Solaris argue that Waldner satisfies limitation 1[k] requiring the outboard segment to pivot ‘about a substantially vertical axis.’” PO Resp. 29. But, as discussed below in greater detail, Solaris relies on the *combination* of Waldner *and* Dynatek, not simply on Waldner, for disclosing these claim elements. *See* Pet. 43–46 (mapping elements 1[j]–1[k] to Waldner *and* Dynatek). Because Masaba fails to address the challenge as actually articulated by Solaris, we find Masaba’s argument on this point unavailing.

Indisputably, Waldner *in combination with Dynatek* discloses claim elements 1[j] and 1[k]. *First*, Solaris shows that Waldner’s discharge chute member 242 (which corresponds to the claimed “extension conveyor”) includes two-parts: “a proximal section 244” that corresponds to the

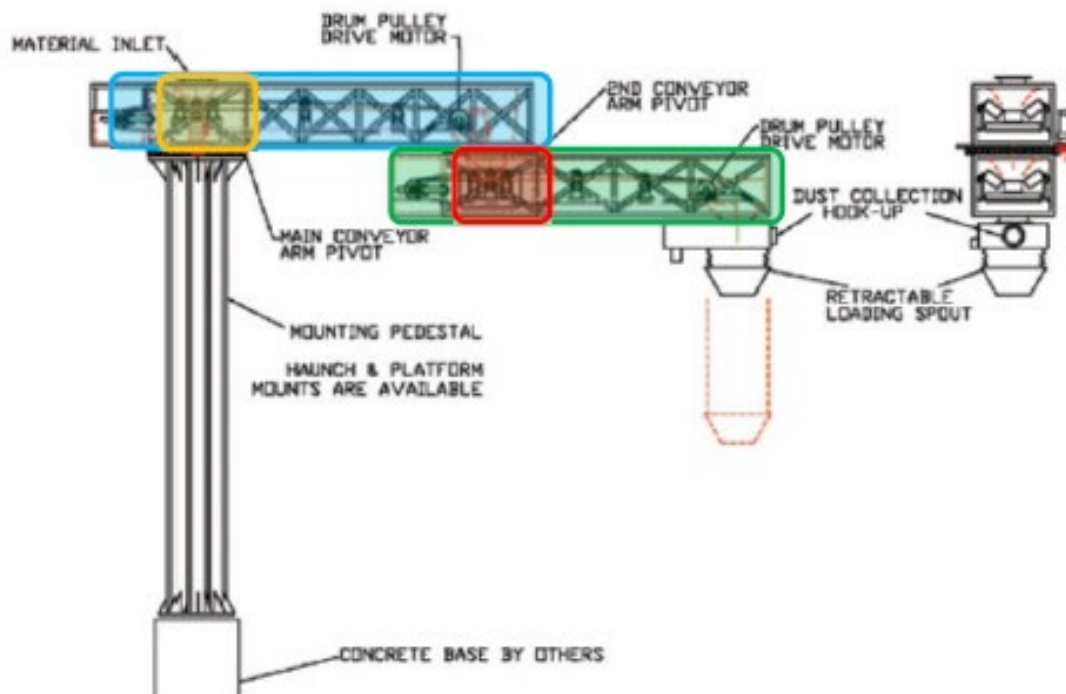
claimed “inboard segment,” and “a distal section 246” that corresponds to the claimed “outboard segment.” *See* Pet. 43 (citing Ex. 1004, 25:7–12, Fig. 22). Nowhere do we discern that Masaba ever disputes that Waldner’s proximal section 244 and distal section 246 correspond to the claimed “inboard” and “outboard” segments.

Second, Solaris shows that Waldner satisfies the “inboard pivot” limitation of claim elements 1[j] and 1[k] by showing that Waldner’s proximal section 244 (the claimed “inboard segment”) is pivotally connected to frame 254 of elevating assembly 50' by means of “mounting brackets 252a/252b, links 256/262 and pivot pins.” *See id.* (citing Ex. 1004, 25:30–57). Again, Masaba does not dispute that particular showing by Solaris. Indeed, Waldner’s Figure 22A, reproduced below, depicts just such a pivotal connection for Waldner’s inboard segment 244.



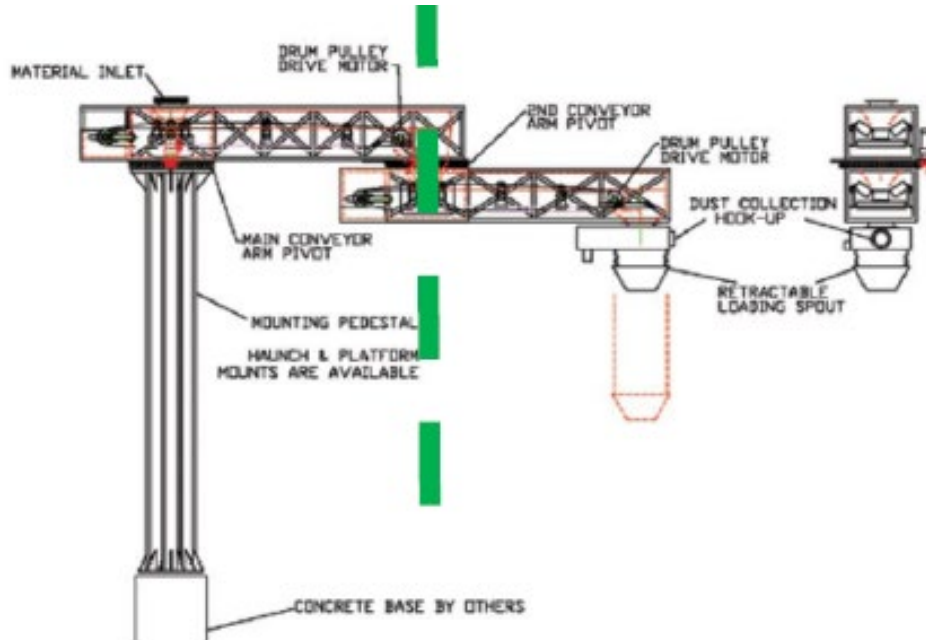
Nonetheless, Waldner lacks any disclosure of its proximal section 244 and distal section 246 (the claimed “inboard” and “outboard” segments) being “articulated” relative to one another by means of “an outboard pivot” for rotation “about a substantially vertical axis,” as required by claim elements 1[j] and 1[k]. Instead, Waldner discloses that they are “*slidably* coupled together” to “collectively form an enclosed tubular passage from an inlet end 244a of the proximal section to an opposing discharge end 246a of the distal section.” Ex. 1004, 25:7–13 (emphasis added).

That being the case, Solaris turns to Dynatek’s teaching of a conveyor extension assembly that includes “articulated” inboard and outboard segments for moving aggregate from one place to another. *See* Pet. 43–46 (citing Ex. 1005, at 2, Fig. 2; Ex. 1014, at 40–43). In particular, Solaris submits an elevational view of Dynatek’s conveyor extension, reproduced below, to illustrate how it satisfies claim elements 1[j] and 1[k]. *See* Pet. 44 (annotating Ex. 1005, Fig. 2).



As shown above, much like Waldner, Dynatek's conveyor extension includes two conveyor arms—an inboard segment (blue) and an outboard segment (green)—with an inboard pivot (orange) connecting the inboard segment (blue) to a mounting pedestal for pivotable movement about a vertical axis. But, unlike Waldner, Dynatek also discloses *an outboard pivot (red)* between the inboard and outboard segments such that they can be articulated and pivoted relative to each other about a substantially vertical axis, as required by claim elements 1j and 1k. Indeed, Dynatek expressly discloses that the inboard and outboard conveyor arms are “designed for articulated motion,” in particular, by means of “[t]wo slewing bearing pivots, [which] enable both conveyor arms to pivot separately resulting in nearly 330 degrees of rotation.” Ex. 1005, at 2; *see also* Ex. 1014, at 40–43. In other words, Dynatek teaches the “articulated” motion and “pivotable” connection that is lacking in the connection between Waldner's inboard and outboard segments.

Also, as reproduced below, Solaris annotates Dynatek's figure to show the vertical axis (green) about which the inboard and outboard segments rotatably pivot relative to each other. *See* Pet. 45–46 (annotating Ex. 1005, Fig. 2).



As shown and disclosed in Dynatek, both the inboard and outboard segments of the are pivotable about a vertical axis (green) that is defined by what Dynatek labels as “2nd Conveyor Arm Pivot,” which indisputably corresponds to the claimed “outboard pivot.” Ex. 1005, at 2; Ex. 1014, at 40–43.

Without question, those figures and disclosures by Dynatek satisfy the “outboard pivot” limitations of claim elements 1[j] and 1[k] that are lacking in Waldner. Indeed, nowhere do we discern that Masaba ever disputes Solaris’s showing that, *when combined*, Waldner and Dynatek disclose all the elements of claim 1, i.e., claim elements 1[a]–1[k]. See PO Resp. 27–29 (disputing only *Waldner’s* disclosure of elements 1[h]–1[k]). Instead, Masaba’s sole argument with respect to the *asserted combination* lies in Solaris’s reason for combining their respective teachings. But, as discussed below, the respective teachings of Waldner and Dynatek are clearly combinable with a reasonable expectation of success of arriving at the claimed invention.

4. *Solaris's Reason for the Combination*

Solaris argues that one skilled in the art would have considered it obvious: (1) “to use the articulated belt conveyor of *Dynatek* in place of *Waldner*’s discharge chute 242,” *or* “to modify [*Waldners*] discharge chute 242 to pivotally connect its distal section to its proximal section by an outboard pivot.” Pet. 44 (citing Ex. 1003 ¶¶ 71, 160–61). As discussed below, we find that Solaris provides persuasive reasoning for why one skilled in the art would have undertaken to “substitute” *Dynatek*’s two-part conveyor belt for *Waldner*’s two-part conveyor chute *and/or* to “modify” *Waldner*’s two-part conveyor chute to include an outboard pivot, as taught by *Dynatek*, such that the two parts are articulated and pivotable about a vertical axis. *See id.* at 25–28.

At the outset, we note that *Waldner* *and* *Dynatek* are both directed to conveyor belt systems for moving granular material from one location and discharging it at another location, such as a storage bin, truck, or barge, *without needing to adjust position of the other location*. *See* Ex. 1004, 2:36–41; Ex. 1005, at 2. For instance, *Waldner* teaches that “an operator can adjust the point of final discharge of granular material from the system *without having to move the trailer*” because “the discharge end 246a of the discharge member 242 is moveable . . . to allow relocation thereof to various positions in 3D space.” Ex. 1004, 15:14–21, 25:64–66. *Dynatek* teaches the same benefit, stating that “[l]oading is fast and convenient because you position the loader, not the truck, railcar or barge being loaded.” Ex. 1005, at 2; *see also id.* at 3 (“Loader Moves—Not the Transport Vehicle,” which “lets you precisely position the discharge point without having to move the truck, railcar or barge.”); Ex. 1014, at 41 (disclosing that *Dynatek*’s EconoLoader “will reduce or eliminate the need to move the rail

car, truck or barge during the loading process by allowing the loading conveyor and discharge spout to move instead.”).

However, as plainly shown and noted by Solaris, Waldner’s discharge chute is limited, *first*, in its range of motion due to its proximal and distal sections being slidably-coupled, and, *second*, in its rate of discharge due to movement of the granular material being controlled by the chute’s angular orientation and gravity. *See* Pet. 26–27 (citing Ex. 1003 ¶¶ 115, 118). It does not take an expert to recognize those drawbacks with Waldner’s discharge chute. Nonetheless, Solaris’s expert confirms that one skilled in the art would have recognized such drawbacks and looked for a way to improve upon them:

[I]n Waldner, movement of particles through the discharge chute is controlled only by gravity and the angle of the chute. Waldner’s mechanism for adjusting the discharge chute’s position may be limited [in] its precision and range of motion. A POSITA building the Waldner system would have looked to other known conveyor systems, ***such as Dynatek***, that achieve similar objectives, e.g., to optimize its design and/or to potentially incorporate commercially-available components to enhance control and/or particle movement rates.

See Ex. 1003 ¶ 115 (emphasis added).

Notably, as Solaris’s expert explains, Dynatek teaches belt-conveyors “designed for articulated motion,” such as Dynatek’s EconoLoader, that “enable both conveyor arms to pivot separately resulting in nearly 330 degrees of rotation and loader reach of up to 27 feet.” *Id.* ¶ 116 (citing Ex. 1005, at 2). As such, “[a] POSITA ***would have recognized*** that the combination of [Dynatek’s] ‘nearly 330 degrees of rotation’ and [Waldner’s] vertical discharge from ‘3 to 60 feet’ means discharge to various positions in 3D space, similar to *Waldner*.” *Id.* ¶ 116 (citing Ex. 1005, at 2) (emphasis

added). In other words, one of ordinary skill in the art would have recognized that Dynatek's wide range of rotation and reach resolves the problem of extension conveyors with a limited range of motion in 3D space, such as Waldner's discharge chute.

The important inquiry is whether one of ordinary skill in the art is "able to recognize, based on her background knowledge, [a technique's] potential to improve the device and be able to apply the technique."

Unwired Planet, LLC v. Google Inc., 841 F.3d 995, 1003 (Fed. Cir. 2016).¹¹

Indeed, a patent challenger need not prove that there was a known problem with the prior art in order to demonstrate that there was a motivation to combine prior art references. *Id.* at 1002–03. Here, recognizing Waldner's drawbacks and Dynatek's benefits, Solaris's expert testifies that one skilled in the art "would have been motivated to substitute the EconoLoader of Dynatek for the discharge chute of Waldner, *e.g.*, to maximize the rotation and reach of the system . . . and/or increase discharge rates," as confirmed by Solaris's expert. Ex. 1003 ¶ 118. We find that testimony credible and consistent with the background knowledge in the art. Indeed, combining the teachings of Waldner and Dynatek involves nothing more than the substitution of one known component (Dynatek's EconoLoader) for another known component (Waldner's discharge chute) to obtain the predictable

¹¹ During the oral hearing, Masaba objected to certain of Solaris's demonstratives because they included "citations" to "cases not cited in the briefings." *See* Hrg. Tr. 38:15–18 (objecting to Solaris's slides 18, 36–38, 48, 62, 76). According to Masaba, Solaris's mere "citation" of such cases constitutes "new arguments." *See id.* We disagree. Solaris cites those cases merely in support of arguments already made in their papers, as shown by our discussion here. As such, Solaris's citations are not improper new argument. Thus, Masaba's objection is overruled.

result of increasing the range and reach of the conveyor's discharge point, as well as improving control over the rate at which the granular material is discharged.

Moreover, one skilled in the art would have recognized that modifying Waldner's discharge chute to include the outboard pivot and articulated conveyor belts of Dynatek would achieve those same predictable results. This modification would involve nothing more than using the known technique of articulated conveyor sections from Dynatek instead of the telescoping sections of Waldner to increase the range of motion of the conveyor's discharge point, and using the belt conveyors of Dynatek instead of the gravity-dependent chute of Waldner to better control the discharge rate of the granular material. *See id.*

Under either theory (substitution or modification), we agree with Solaris's expert that one skilled in the art would have looked to known conveyor systems, such as Dynatek's EconoLoader, to optimize the range of motion and rate of discharge of Waldner's discharge chute. We find his testimony credible and consistent with the teachings of Waldner and Dynatek.

Masaba argues that Solaris's reason for combining Waldner and Dynatek "*assumes*, without any supporting reasoning, that *Waldner's* chute does not have sufficient 'range of motion and reach.'" PO Resp. 30. According to Masaba, because Waldner's chute is designed "to extend telescopically 'to various positions in 3D space,'" it already has sufficient range of motion and reach. *Id.* (citing Ex. 1004, 25:58–66). And, "[w]ithout any reason why *Waldner* needs *more* 'range of motion and reach,' Solaris has not identified a true, non-hindsight motivation," Masaba alleges. *Id.*

But, as Solaris’s expert explains, just looking at Waldner’s Figure 22A, one of ordinary skill in the art would see that its range of motion is “mechanically limited the way it’s designed. It’s limited somewhere around 180 degrees” and “relative to the frame of Waldner, as you swing [discharge chute 242], you’re going to have to stop somewhere in the neighborhood of 180 degrees.” Ex. 2003, 77:19–78:10. And, continuing with Waldner’s Figure 22A, Solaris’s expert further explains—

a POSITA with experience and seeing and at least understanding these type systems would understand that that swing mechanism with no framework to guide it, having that big cantilever out away from the actuator would limit precision.

In other words, it would be very difficult to swing it precisely where you want because you’re controlling a long member with a short member. So that makes it challenging to position exactly where you want it. Anybody that’s been around mechanical systems of this type would understand that and a POSITA would.

Id. at 83:4–20. So, recognizing that Waldner’s range of motion is limited mechanically to 180 degrees, one skilled in the art would have understood the benefit of increasing the range of motion and precision of Waldner’s chute and looking to known conveyor systems, such as Dynatek’s EconoLoader, to do so. *See id.* at 78:19–79:3 (“To a POSITA, any increase in range of motion is beneficial” and a range of motion that “increased from 180 to 330 would be beneficial — certainly.”).

We find that testimony of Solaris’s expert to be credible, persuasive, and consistent with the teachings of Waldner and Dynatek. It supports that one of ordinary skill in the art would have had sufficient reason to substitute Dynatek’s EconoLoader for Waldner’s discharge chute, and/or to modify Waldner’s discharge chute to incorporate the outboard pivot and articulated

conveyor belts taught by Dynatek, in order to increase the range and precision lacking from Waldner's discharge chute.

Indeed, Masaba's own engineering manager, David Brinkman, acknowledges that Masaba's engineers were fully aware of Dynatek's EconoLoader at the time they were pursuing the claimed conveyor system—

When pursuing the bucket elevator design, Masaba engineers were aware of the Dynatek Econoloader articulated belt conveyor (shown in Appendix A) but believed that it would not work with the bucket elevator (and still believe that it would not work) for several reasons: 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. . . . 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.

Ex. 2005 ¶ 12. But, despite their initial thoughts that Dynatek's conveyor system was too short, too heavy, and too high, Masaba nonetheless returned to the very design taught by Dynatek, only claiming that "Masaba engineers conceived of an articulated belt conveyor with inner and outer segments implemented as slider-bed conveyors." PO Resp. 17 (citing Ex. 2005 ¶ 12).

That testimony by Masaba's engineering manager, Mr. Brinkman, indicates that those of ordinary skill in the art, not only knew of Dynatek's EconoLoader in the relevant time frame, but also would have understood that "articulated" belt conveyors, as taught by Dynatek, represented a known alternative to telescopic conveyors. Indeed, Solaris's lead mechanical engineer, Jeremy Weinstein, who sought Masaba's help in developing Solaris's "original idea" of "conveyors to fill silos from an outlet at the top of the silo" corroborates that "Dynatek's articulated airslide systems (like those shown in with EX1014 at pages 28–29)" were a known alternative

because they “were a commonly-used type of conveyor in the marketplace at that time.” Ex. 1112 ¶¶ 8–9. According to Mr. Weinstein,¹²

[i]n my experience, incorporating an articulated loader like the Dynatek conveyor systems into this [bucket elevator] system was an obvious way to more effectively reach the inlets at the top of the silos from the top of the conveyor. Articulated loaders with double slewing joints like the Dynatek EconoLoader were well known and commonly used for conveying bulk dry materials.

Id. ¶ 10. And, “because it was well known and commonly used,” Mr. Weinstein “approved Masaba and Anchor¹³ using a loader like the Dynatek conveyors in the system they were designing for Solaris.” *Id.* ¶ 11.

That testimony by the engineers of both Masaba and Solaris is insightful as to why one of ordinary skill in the art would have looked to Dynatek’s EconoLoader as an alternative to Waldner’s telescopic chute. Indeed, Masaba’s own expert (Mr. Anderson) identifies the problem with Waldner’s telescopic chute that would have prompted the modification and/or replacement of Waldner’s telescopic chute, namely, a limited operating envelope. In particular, Masaba’s expert testifies that

[T]he Waldner system, . . . I envision it to have this envelope of operation based on, you know, those parameters of the chute length. So if one were to want to hit those points [outside the envelope], then that *envelope would have to expand so various things would have to be done.*

¹² During the hearing, Masaba objected to Solaris’s slide 52 as allegedly proffering Mr. Weinstein as an expert witness. *See* Hrg. Tr. 38:19–39:4. But Solaris acknowledged it was simply relying on his testimony as indicative of the knowledge in the art, not his opinion on the ultimate legal conclusion of obviousness. Thus, Masaba’s objection in this regard is overruled. In any event, demonstratives are not evidence, and we do not rely on them for purposes of this decision.

¹³ Anchor was a liaison between Masaba and Solaris.

In other words, a longer chute, perhaps a taller bucket elevator for, you know, to discharge the material into it or various other things.

So in a sense, it would be —*the Waldner system is set up for a particular envelope, and then there would be other maybe . . . various modifications* in order to hit those components [outside envelope of operation].

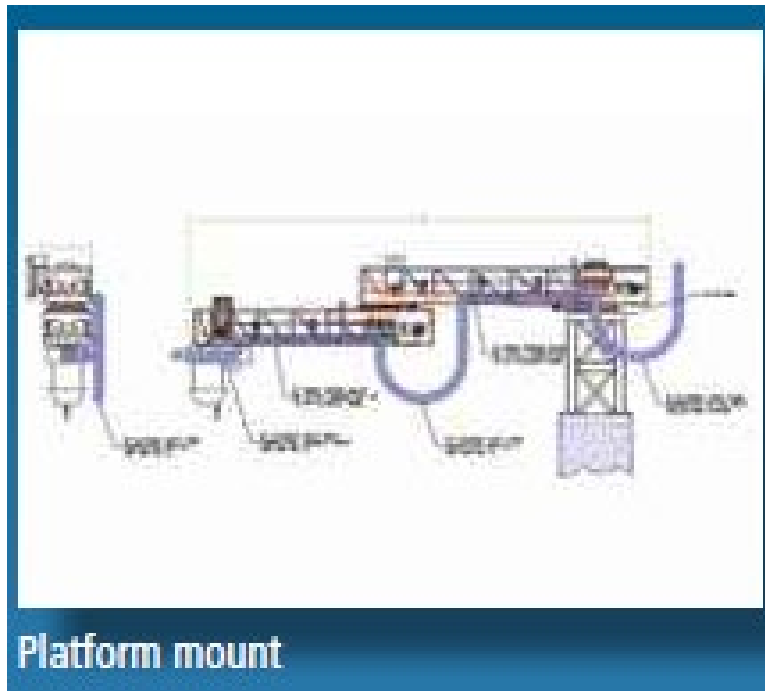
Ex. 1113, 330:9–331:4 (emphases added). That testimony is consistent with the testimony of Solaris’s expert, who likewise testifies, as discussed above, that one of ordinary skill in the art would see that Waldner’s range of motion is “mechanically limited the way it’s designed. It’s limited somewhere around 180 degrees.” Ex. 2003, 77:19–24; *see also id.* at 83:4–20 (essentially same).

To the extent Masaba argues one of ordinary skill in the art would have overcome Waldner’s limited envelope of operation “by merely increasing the length of *Waldner*’s chute,” we are not persuaded. *See* PO Resp. 31. In particular, Masaba’s expert conceded that simply lengthening Waldner’s chute presents yet another problem because, once Waldner’s chute is telescoped out, the farther horizontally it reaches, the shallower its angle must be, slowing the speed at which aggregate will slide down the chute. *See* Ex. 1113, 298:7–299:7 (“So a shallow angle means that the chute will not be able to transfer the flow rate as much as if it was, say, in a more vertical position.”). That testimony shows that one of ordinary skill in the art would have rejected the idea of merely lengthening Waldner’s discharge as a potential solution to Waldner’s limited range of motion.

In sum, the testimony by both Masaba’s expert and Solaris’s expert supports that Waldner’s discharge chute was ready for improvement. *See KSR Int’l. Co. v. Teleflex, Inc.*, 550 U.S. 398, 417–418 (2007) (“[T]he mere application of a known technique to a piece of prior art ready for

improvement” does not render it non-obvious “when it does no more than yield predictable results.”). And, without question, Dynatek’s articulated belt conveyor with an outboard pivot was a known solution to Waldner’s limited range of motion. Also, one of ordinary skill in the art would have had a reasonable expectation of success in combining the teachings of Waldner and Dynatek because doing so involves nothing more than the substitution of one known conveyor extension (Dynatek’s EconoLoader) for another conveyor extension (Waldner’s discharge chute), or the incorporation of one known technique (a two-part telescopic chute) with another known technique (an outboard pivot for articulating a two-part conveyor), to obtain the predictable result of conveying the materials to another location with increased range, precision, and control.

More specifically, not only do Dynatek and Waldner teach similar benefits—*i.e.*, precisely adjusting the discharge point of their conveyor systems without needing to move the container or vehicle being loaded—but Dynatek also uses known “structural truss frames” and “platform mounting” similar to the elevator frame (254) supporting Waldner’s discharge chute. Ex. 1005, at 2–3. Indeed, as reproduced below, Dynatek contemplates just such a mounting technique for its articulated conveyor. Ex. 1014, at 42.



As the section in Dynatek, entitled “Mounting,” explicitly states:

The EconoLoader can be mounted on a post, platform or haunch. We can work with your existing structure, propose a standard solution or adapt the mounting to your individual specifications.

Best of all, DYNATEK will have your Econoloader up and running in as little as two days! Our material handling design experience, coupled with modern facilities and manufacturing techniques, plus in-stock materials and components, allows for rapid fabrication and delivery. Once on-site, DYNATEK’s installation experts will support your personnel to ensure fast and easy installation – two days or less.

Id. at 41.

Thus, Dynatek itself recognizes that mounting its EconoLoader to an existing truss frame structure, such as Waldner’s elevator frame 254, would have involved nothing more than their “installation experts” utilizing “standard solution[s]” to “ensure fast and easy installation.” *Id.* Those disclosures by Dynatek confirm that the substitution and/or modification of Waldner’s discharge chute with an articulated belt conveyor like Dynatek’s

would have been a matter of routine engineering readily known and available to one skilled in the art. Solaris’s expert likewise confirms that such a substitution would have involved nothing more than routine engineering. *See* Ex. 1003 ¶¶ 120–121.

We have considered Masaba’s arguments to the contrary—“belt mistracking,” “the weight of Dynatek’s conveyors,” and “transportable height”—but find them unpersuasive. PO Resp. 34–39. In support of these arguments, Masaba cites to the testimony of its expert. *Id.* (citing Ex. 2004 ¶¶ 55–61. But that testimony simply parrots Masaba’s arguments without citation to any evidence in support of the opinions therein. As such, we find it to be conclusory and entitled to little, if any, weight. As Dynatek itself recognizes, the “[e]ngineering capabilities” of those skilled in the art, such as “DYNATEK’s installation experts,” would have addressed such problem and risks that might arise with the incorporation of Dynatek’s teachings into Waldner’s conveyor system.

Each EconoLoader is engineered to meet the optimal needs of your application. Structural design, method of conveying, conveying capacities, wind load, and site parameters are all carefully considered when designing a bulk loading installation.

You can rely on an outstanding level of applications expertise and engineering know-how behind all DYNATEK products. DYNATEK engineers provide fast and efficient designs and layouts using state-of-the-art CAD systems. Finite element analysis is used as required to assure maximum strength at all stress points for sound, strong, trouble-free operation. Stress analysis techniques combined with classical engineering mechanics assure a sound and safe loading system.

Ex. 1014, at 41.

In any event, that modifying Waldner’s two discharge chute to accommodate Dynatek’s two-part articulated belt conveyor may involve

“design decisions [that] entail making tradeoffs . . . does not necessarily obviate motivation to combine.” *Corephotonics, Ltd. v. Apple Inc.*, 2021 WL 4944471, at *6 (Fed. Cir. Oct. 25, 2021) (quoting *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016)); see *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1382 (Fed. Cir. 2007) (“[W]e do not ignore the modifications that [POSITAs] would make to a device borrowed from the prior art.”).

In sum, as discussed above in Sections II.C.1–3, we find that the asserted combination of Waldner and Dynatek discloses all the elements of claim 1. And, for the reasons discussed in Section II.C.4, we find that one skilled in the art would have had sufficient reason with rational underpinning to combine their respective teachings to arrive at the claimed invention with a reasonable expectation of success.

5. *Secondary Considerations*

Masaba raises secondary considerations as showing non-obviousness of the claimed invention. See PO Rep. 70–73. As evidence of non-obviousness, Masaba alleges that Solaris “had a need” for the claimed invention, “was skeptical” of Masaba’s design that resulted in the claimed invention, “praised the Masaba machine” as built and tested, and “made dozens of copies of it.” *Id.* at 70. In making those allegations, however, Masaba cites to numerous exhibits—Exhibits 2005–2031—without offering any additional, let alone meaningful, explanation or analysis. See *id.* Masaba similarly strings together multiple quotes from the relevant case law without any further discussion of how they support Masaba’s conclusory allegations. See *id.* at 71–72.

Moreover, in arguing “there is a presumption of nexus,” Masaba merely states that “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,” before again *string citing* to multiple exhibits—“Exs. 2007, 2008, 2011, 2025–2030, 2005 ¶¶ 17–21” and “Ex. 2037 (Exhibit 9).” *See id.* at 72–73. No further explanation or analysis is provided regarding how Solaris’s Top Fill machines satisfy the claim elements. That is the entirety of Masaba’s showing on non-obviousness, despite having the burden on the issue.

Without question, Masaba bears the burden of establishing nexus. *WMS Gaming Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999). A presumption of nexus is only appropriate if “the patentee shows that the asserted objective evidence is tied to a specific product and that product embodies the claimed features, and is coextensive with them.” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (cleaned up). The coextensiveness requirement is not met simply by showing “the patent claims broadly cover the product that is the subject of the evidence of secondary considerations.” *Id.* at 1377. Rather, coextensiveness relates to “the degree of correspondence between a product and a patent claim.” *Id.* at 1374. And, although “the existence of one or more unclaimed features, standing alone” does not necessarily defeat coextensiveness (*id.*), “the concept of unclaimed features is best viewed as part of a spectrum.” *Teva Pharma. Int’l GmbH v. Eli Lilly and Co.*, 8 F.4th 1349, 1361 (Fed. Cir. 2021).

In other words, the presumption of nexus analysis requires the consideration of the unclaimed features of the stated product to determine their level of significance and impact on the correspondence between the

claims and said product. *See Fox Factory*, 944 F.3d at 1375. So, to establish a nexus, Masaba needed to focus on and consider the difference between the prior art and the claimed invention, and discuss the extent to which the evidence of secondary considerations derived from any “unique characteristics” of the claimed invention. *See Campbell Soup Co. v. Gamon Plus, Inc.*, 10 F.4th 1268, 1278 (Fed. Cir. 2021) (“[T]o establish a nexus, [the patent owner] needed to present evidence that the commercial success and praise of the [product] derived from those ‘unique characteristics.’”) (citing *Fox Factory*, 944 F.3d at 1373–74). Simply providing evidence tied to features already present in the prior art does not satisfy the inquiry. *Id.* (“objective indicia must be linked to a [] patent claim’s unique characteristics”); *Fox Factory*, 944 F.3d at 1378 (stating that for patents claiming combinations of prior art features, a patentee must show that the secondary considerations evidence is “attributable to the claimed combination of [prior art features], as opposed to, for example, prior art features in isolation or unclaimed features”).

Here, Masaba’s showing regarding nexus is not only conclusory, but extensively incorporates by reference various portions of numerous exhibits. *See* PO Resp. 70, 72. And to the extent Masaba later attempts to cure that failure, it fares no better. *See* PO Sur-Reply 21–22. There, Masaba again string cites to multiple exhibits—“Exs. 2007, 2008, 2011, 2025–2030, 2005 ¶¶17-21 & Appx. B” and “Ex. 2037, pp. 68–95”—while stating, in conclusory fashion, that “[p]hotographs of Solaris’s system as well as Solaris’s brochures, presentations, and animations clearly show that its system has all the elements of the claims at issue and is coextensive with them.” PO Sur-Reply 21. But, aside from identifying these exhibits as photographs and presentations of Solaris’s system, Masaba again does not

provide any meaningful explanation or analysis for why we should accept its word. In essence, Masaba invites us to scour these exhibits and discern for ourselves whether Masaba meets its burden of proving nexus. We decline that invitation. Thus, we find that Masaba fails to demonstrate that Solaris's system is co-extensive with the claimed invention. *Accord Volvo Penta of the Americas, LLC v. Brunswick Corporation*, 81 F.4th 1202, 1210–11 (Fed. Cir. 2023) (holding that the Board correctly found conclusory arguments to be insufficient to establish a nexus).

In any event, Masaba states that the unique characteristics of its alleged invention lie in “using an articulated belt conveyor with inner and outer segments *implemented as slider-bed belt conveyors*.” PO Resp. 7 (emphasis added). Although claimed, an articulated belt conveyor with inner and outer segments is a feature already present in the prior art, namely, Dynatek, as we explain above with respect to the asserted combination of Waldner and Dynatek. *See supra* Section II.C.3. That leaves Masaba's use of a “*slider-bed belt conveyor*” as the unique characteristic distinguishing its alleged invention from conventional belt conveyors such as the Dynatek-type belt conveyor used in Solaris's system. Indeed, Masaba admits as much, explaining that “[s]lider-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*)” and “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*.” PO Resp. 7.

Notably, however, those supposed unique characteristics identified by Masaba are all unclaimed features. Nowhere do the claims require that the

claimed invention have a “slider-bed” type of belt conveyor, let alone mention that the belt conveyor slides on a steel pan without any idler rollers. Nor do the claims specify anything about the weight, height, or strength of the inner conveyor relative to the outer conveyor. Instead, those alleged unique characteristics are all unclaimed features. And, even if somehow those features are claimed (for example, under a 35 U.S.C. § 112(f) theory), nowhere does Masaba explain where they are embodied in Solaris’s system. Thus, for this additional reason, we find that Masaba fails to establish a nexus between the claimed invention and Solaris’s system.

Nevertheless, we review Masaba’s evidence of secondary considerations as it further illustrates the weakness of Masaba’s contentions. For instance, Masaba attributes to the claimed invention the praise and success that Solaris touted to investors about the “flexibility and reliability” of Solaris’s system “using either higher payload belly dump truck trailers or traditional pneumatic trailers.” PO Resp. 70 (citing Exs. 2007–2030); *see also id.* at 18 (citing Ex. 2013, 2:24–4:20), *id.* at 21 (“[O]ur 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.”). But Waldner similarly discloses the benefits of deployable systems that accept granular material from belly-dump trucks (Ex. 1004, 16:18–50, Figs. 1, 12, 15), and the claim elements absent from Waldner—such as an articulated extension conveyor, landing legs, kingpin, and an articulated lift arm structure—have nothing to do with such benefits. Neither the success nor praise of Solaris’s system relating to features already in the prior art can rebut obviousness of a claimed invention that simply adds such features. *See ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1220 (Fed. Cir. 2016) (discounting evidence relating to prior art features). Masaba’s allegation

regarding Solaris’s skepticism of bucket elevators (*see* PO Resp. 70) fails for similar reasons given Waldner’s clear disclosure of deployable bucket elevator systems, as discussed above.

Masaba also asserts that Solaris copied the claimed invention. *See* PO Resp. 70 (citing Ex. 2005 ¶¶ 21–24, Exs. 2007–2030). However, Masaba never disputes the testimony of Solaris’s lead engineer, Mr. Weinstein, that “[t]he original idea for the top fill system *started at Solaris* during the spring and summer of 2020,” before “any contact with Masaba” and well before the July 2021 priority date of the ’689 patent. Ex. 1112 ¶ 8 (emphasis added). Nor does Masaba dispute that, in that time frame, Solaris was “working with Masaba and Anchor to assemble the features *that Solaris had requested* into a design drawing,” including the use of “Dynatek’s articulated airslide systems” that “were a commonly-used type of conveyor in the marketplace at the time.” *Id.* ¶ 9 (citing Ex. 1102, at 2). Thus, we are unmoved by Masaba’s assertions of copying given Solaris’s indisputable involvement in the design.

And, to the extent Masaba relies on the testimony of Masaba’s engineering manager, Mr. Brinkman, as evidence of copying, we note that he cites solely to a “Solaris spec sheet” (Ex. 2005, Appendix B) that shows features already found in the prior art and requested by Solaris as part of the design, including the belly-dump feature of Waldner and the articulated belt conveyor feature of Dynatek. *See* PO Resp. 70 (citing Ex. 2005 ¶ 24). Also, we are not persuaded by Masaba’s allegation that Solaris’s separate patent relating to its top fill system is further evidence of copying. *See* PO Resp. 70 (citing Ex. 2031). That is because Masaba fails to compare the claims of Solaris’s patent to those of the ’689 patent. *See id.* (simply citing “Ex.

2031” without further explanation). Again, Masaba places the burden on us, rather than itself, to distill its evidence of copying.

Nor are we persuaded by Masaba’s assertion that “Solaris admitted using Masaba’s unit in making Solaris’s fleet.” PO Sur-Reply. 24 (citing Ex. 2042, 57:25–58:16, 83:2–84:25). In support, Masaba cites the testimony of Mr. Weinstein (Solaris’s lead engineer), but that testimony is consistent with his earlier testimony that, as discussed above, the design of Masaba’s unit was, in fact, Solaris’s design. *See* Ex. 2042, 58:9–10 (“We viewed that we owned the design.”); *id.* at 83:7 (same). And even if Solaris’s patent was somehow relevant, that alone would not outweigh Solaris’s otherwise strong evidence of obviousness.

6. *Conclusion*

To summarize, Masaba’s evidence of non-obviousness is directed to showing how Solaris’s system includes beneficial features already known in the prior art, such as a deployable bucket elevator with an outwardly pivotable two-part extension conveyor like the one in Waldner. To the extent Masaba believes its success lies in providing an articulated extension conveyor, Dynatek already does this. In other words, the allegedly unique features of the ’689 patent are features already present in Waldner and Dynatek, not a point of novelty allegedly arising from a combination of features not present in the prior art. *See Fox Factory*, 944 F.3d at 1378 (stating that for patents claiming combinations of prior art features, a patentee must show that the secondary considerations evidence is “attributable to the claimed combination of [prior art features], as opposed to, for example, prior art features in isolation or unclaimed features”). Weighing the evidence of obviousness against the evidence of non-obviousness, we determine that Solaris demonstrates by a preponderance of

the evidence that the claim 1 would have been unpatentable as obvious over the combined teachings of Waldner and Dynatek.

Solaris also challenges independent claims 16, 18, 22, and 23 (and their respective dependent claims 2, 4–11, 17, 19, 20, and 24) based on this same ground of unpatentability. *See* Pet. 5, 46–63. As mentioned at the beginning of our analysis of claim 1, aside from its arguments made with respect to claim 1, Masaba does not otherwise contest Solaris’s showing for independent claims 16, 18, 22, and 23, or its showing for dependent claims 2, 4, 5, 8–11, 17, 19, 20, and 24. *See* PO Resp. 42–43, 48 (“Ground 1 Fails for Claims 2, 4–11, 16–20, and 22–24 for the Same Reasons That It Fails for Claim 1” with “Additional Reasons” only for dependent claims 6 and 7). Thus, for the same reasons discussed above for claim 1, we conclude that Solaris demonstrates by a preponderance of the evidence that claims 2, 4, 5, 8–11, 16–20, and 22–24 are unpatentable as obvious over the combined teachings of Waldner and Dynatek. We turn now to Solaris’s showing for dependent claims 6 and 7, which Masaba does contest. *See* PO Resp. 43–49, 53–56.

D. Grounds 1 and 2 (Claims 6 and 7)

Dependent claim 6 adds that the conveyor extension assembly includes “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; and an extension conveyor lift structure acting on the conveyor support frame.” Dependent claim 7 adds that “the extension conveyor lift structure comprises at least one extension actuator.”

Solaris challenges claims 6 and 7 as unpatentable over Waldner and Dynatek, and, *alternatively*, as unpatentable over Waldner and Dynatek with the addition of Pham. *See* Pet. 48–51, 75–79, respectively. We address each ground in turn.

Regarding the first ground, Solaris relies on Waldner, either alone or in combination with Dynatek, to meet these dependent limitations. *See* Pet. 49–51; Pet. Reply 16–17. In particular, Solaris points to Waldner’s disclosure of a combination of brackets, links, actuators, and pivot pins that “collectively provide a conveyor support frame” and “would be movable” when transitioning the discharge chute (the claimed “extension conveyor”) between a lowered and raised position. Pet. 49 (citing Ex. 1004, Fig. 22D); *see also* Pet. Reply 17.

Masaba responds that “Solaris misapprehends how *Waldner*’s parts operate.” PO Resp. 43–44. According to Masaba, Waldner’s brackets 252a/252b “are fixed to frame 254 and do not move with respect to frame 254” and Waldner’s links 252/262 “only move[] horizontally (left/right)” but “do not move with respect to the frame *when the discharge chute moves between the raised and lowered positions.*” *Id.* at 44.

We find it is Masaba, not Solaris, who misapprehends how Waldner’s various links and pivot pins operate in conjunction with Waldner’s actuators to raise and lower discharge chute 242. Indisputably, Waldner’s discharge chute 242 is pivotally connected to elevator frame 254 to move not only “*horizontally* (left/right),” as Masaba contends, but also vertically (up/down) via a combination of moveable links and pivot pins.

Through this actuator controlled connection to the frame 254 of the bucket elevator 50', the discharge member 242 is movable relative to the elevator frame 254 about the vertical axis shared by the pivot pins of the two mounting brackets, *and also*

about the horizontal axis of the pivot pin 258 between the upper link 256 and the discharge member 242. Accordingly, the discharge end 246a of the discharge member 242 is movable about two perpendicular axes to allow relocation thereof to various positions in 3D space.

Ex. 1004, 25:58–66; *see also id.* at 26:15–19 (“*collapse of actuator 266 pulls the discharge end 246a of the discharge member 242 inwardly toward the elevator frame 254, thus establishing a collapsed position of the discharge member 262 lying generally parallel to the bracket equipped side of the elevator frame 254*” (emphasis added)); *id.* at 26:55–63 (“When the bucket elevator 50' is in the raised operational position, then *extension of actuator 266 swings the discharge end 246a upwardly and outwardly away from the bucket elevator frame, . . . as shown in FIG. 15.*” (emphasis added)).

As Solaris correctly notes, and Masaba wholly ignores, it is Waldner’s actuator 266 that pivotally raises and lowers discharge chute 242 relative to elevator frame 254. *See* Pet. 49 (identifying actuator 266 for swinging discharge chute 242 “upwardly and outwardly” away from bucket elevator frame 254). And, as Solaris also correctly notes, it is a series of rotatable links and pivot pins pivotally connecting discharge chute 242 to elevator frame 254 and actuator 266 that constitute the “moveable” portions of Waldner’s conveyor support frame. *See id.*; *see also* Pet. Reply 17. Indeed, Waldner itself confirms that Solaris is correct. As disclosed, the proximal end of discharge chute 242 is pivotally connected to elevator frame 254 by means of link 256 and horizontal pivot pin 258. Ex. 1004, 25:35–42. In addition, “hydraulic linear actuator 266” is “pivotally connected” to frame 254 by means of lower link 262 and horizontal pivot pin 264 and pivotally connected to discharge chute 242 by another horizontal pin 268. Being

pivotal connections, they are clearly moveable. *Id.* at 25:46–51. Nowhere does Masaba ever address those clear disclosures by Waldner that links 256 and 262 and horizontal pivot pins 258, 264, and 268 form rotatable and pivotable, i.e., moveable, portions of Waldner’s conveyor support frame when actuated by actuator 266. *See* PO Resp. 43–45 (focusing exclusively on Waldner’s “fixed” brackets 252a/252b and the “*horizontally* (left/right)” movement of Waldner’s links 256/262, without any mention of Waldner’s pivotable connections for the vertical (upward/downward) swing of Waldner’s discharge chute).

In sum, we reject the notion that Waldner lacks a conveyor support frame that is “moveable” relative to the bucket elevator frame, as required by claim 6. Waldner’s links and pivot pins form a distinct portion of the conveyor support frame and are “moveable” per claim 6. And, when combined with Waldner, Dynatek’s truss frame would be mounted and connected to pivot upward and outwardly in the same manner as Waldner’s discharge chute 242. Ex. 1003 ¶¶ 178–179, 182.

We also reject Masaba’s argument that Solaris relies only on Waldner’s actuator 270 to meet claim 7. *See* PO Resp. 48. As discussed above, Solaris clearly relies on “actuator 266” for the “upwardly and outwardly” movement of Waldner’s discharge chute 242. *See* Pet. 49 (citing Ex. 1004, 25:30–27:19). And, with respect to claim 7’s requirement that the actuator pivot some portion of the conveyor support frame “away from” and “toward” the elevator frame, we note that at least pivot pin 268, where actuator 266 is connected to discharge chute 242, moves towards and away from the elevator frame upon actuation of actuator 266.

For all the above reasons, as well as our reasons discussed above for claim 1 (from which claims 6 and 7 depend), we conclude that Solaris

demonstrates by a preponderance of the evidence that claims 6 and 7 are unpatentable as obvious over the combined teachings of Waldner and Dynatek.

Alternatively, Solaris challenges claims 6 and 7 as unpatentable over the combination of Waldner and Dynatek with the addition of Pham. *See* Pet. 75–79; Pet. Reply 19. According to Solaris, to the extent Waldner and Dynatek do not disclose the “conveyor support frame” of claim 6, Pham teaches a conveyor supported by an “articulated support frame 802.” Pet. 77–78 (citing Ex. 1008, 14:14–15:5, Fig. 19). Solaris annotates Figure 19 of Pham, reproduced below, to illustrate its teaching of a conveyor support frame for an extension conveyor, like Waldner’s or Dynatek’s. *See id.* at 78.

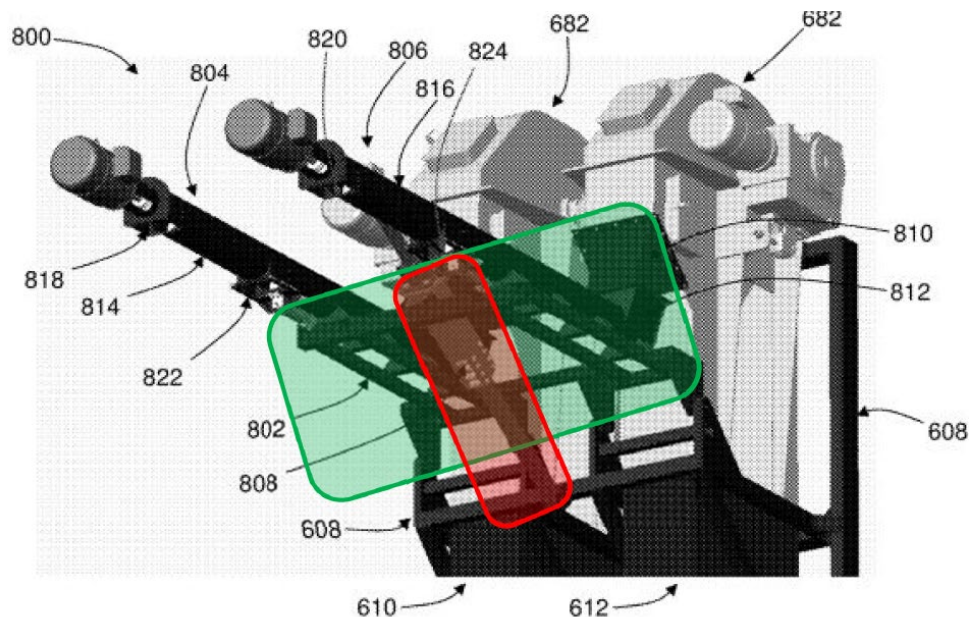


FIG. 19

As shown, annotated Figure 19 depicts conveyor 804 and 806 “disposed onto, and supported by, an articulated support frame 802 (green),” which, in turn, is “movably connected with mast assembly 608” by means of “articulation mechanism 808” (red), “thus enabling support frame 802 to move to/from an operational and stowed orientation.” Ex. 1008, 14:10–25.

Solaris notes the similarity of Pham’s mast assembly 608 to Waldner’s bucket elevator frame 254, as well as the similarity of Pham’s articulation mechanism 808 (red) to Waldner’s actuator 266. *See* Pet. 78–79; *see also* Ex. 1008, Fig. 9 (showing mast assembly 608 of Pham’s bucket elevator).

With those teachings and similarities in mind, Solaris contends that one of ordinary skill in the art “would have considered other similar structures to support [Waldner’s] discharge chute 242 (or the articulated conveyor of *Dynatek*) on the bucket elevator frame 254, *e.g.*, to facilitate converting it between its operational and collapsed configurations to optimize *Waldner’s* design. Pet. 76 (citing Ex. 1003 ¶¶ 299–300). As Solaris explains, “[a]dding *Pham’s* moveable support frame 802” to support similar components of *Waldner* and *Dynatek* or “modifying *Waldner’s* system to incorporate a moveable support frame . . . per *Pham’s* teachings, would allow the modified system to be more easily convertible and transportable on *Waldner’s* trailer.” *Id.* (citing Ex. 1003 ¶¶ 298–300). And one of ordinary skill in the art would have had a reasonable expectation of success in those combinations, Solaris explains, because “they would involve substituting one known component (*Pham’s* support frame and articulation mechanism) for another (*e.g.*, *Waldner’s* brackets 252), *or* improving *Waldner’s* known bracket components to be moveable as taught in *Pham.*” *Id.* at 76–77 (citing Ex. 1003 ¶ 301).

Masaba responds that “[t]he addition of Pham in Ground 2 does not cure Ground 1’s deficiencies for claims 6 and 7” because “[t]he 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.’” PO Resp. 53–54. According to Masaba, “*Waldner’s* actuator 266 already allows *Waldner’s* chute to lower

vertically to a transport position on a trailer,” and “[t]hus, the assertion that the *Pham* combination would ‘be more easily convertible and transportable on *Waldner*’s trailer’ does not make sense.” *Id.* at 54.

We agree with Masaba that Waldner’s actuator 266 already allows the chute to be convertible from an operational position to a stowed position. But that was not the only reason given by Solaris for incorporating Pham’s support frame with the modified system of Waldner and Dynatek. As Solaris’s expert credibly explains, although Waldner “already teaches” the use of an actuator for raising and lowering components the discharge chute, nonetheless, one of ordinary skill in the art would have looked to Pham’s teachings in order to improve Waldner’s known support brackets 252 and make them “movable” to more easily facilitate collapsing the discharge chute into the stowed position. Ex. 1003 ¶ 301; *see also* Pet. 76–77 (citing same).¹⁴ Thus, we find that Solaris articulates a sufficient reason, supported by rational underpinning, for incorporating Pham’s teachings into the modified Waldner and Dynatek system.

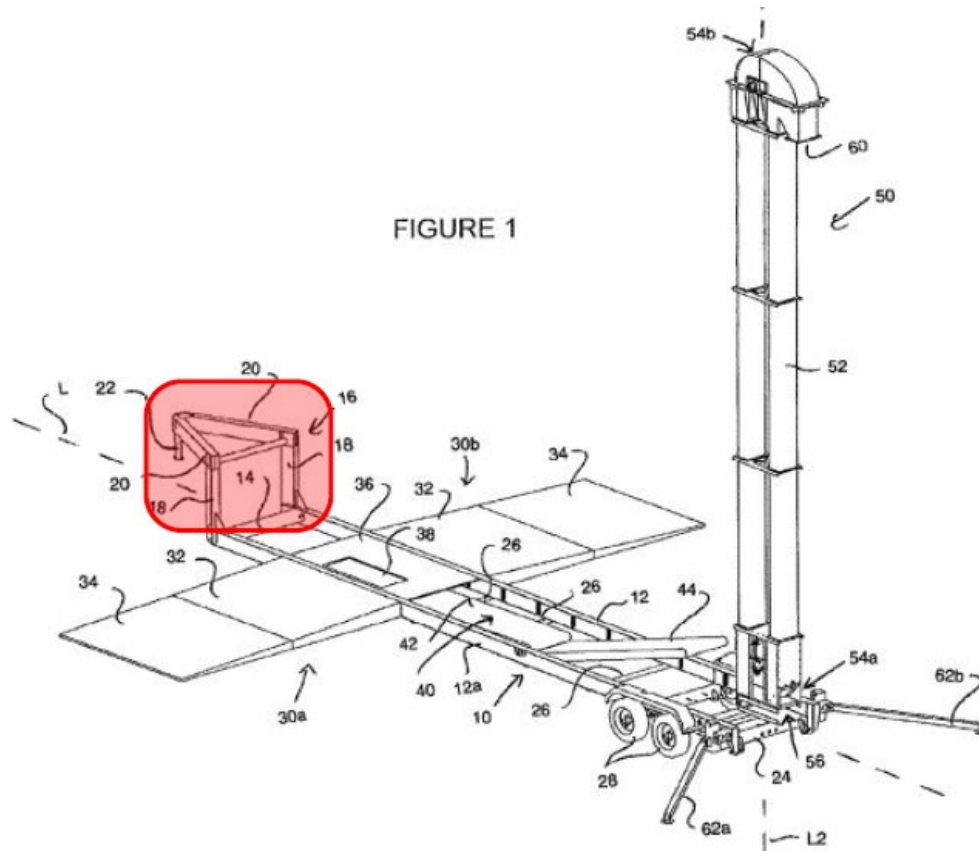
So, for this alternative ground, we conclude that Solaris demonstrates by a preponderance of the evidence that claims 6 and 7 are also unpatentable as obvious over the combined teachings of Waldner and Dynatek with the addition of Pham.

¹⁴ To the extent Masaba disputes this reason by arguing that Solaris and its expert assumed that Waldner’s discharge chute is detached for transport (PO Resp. 54), we note that neither of them made that assumption in the context of Ground 2. *See* Pet. 75–77; EX1003 ¶¶ 297–301. Also, to the extent Masaba argues that Pham’s support frame simply rotates “in the vertical direction . . . but not in the horizontal direction,” the argument is unpersuasive because it ignores that Waldner’s system, as modified by Dynatek and Pham, clearly rotates the extension conveyor about both the vertical and horizontal axes. *See* Ex. 1004, 25:58–66.

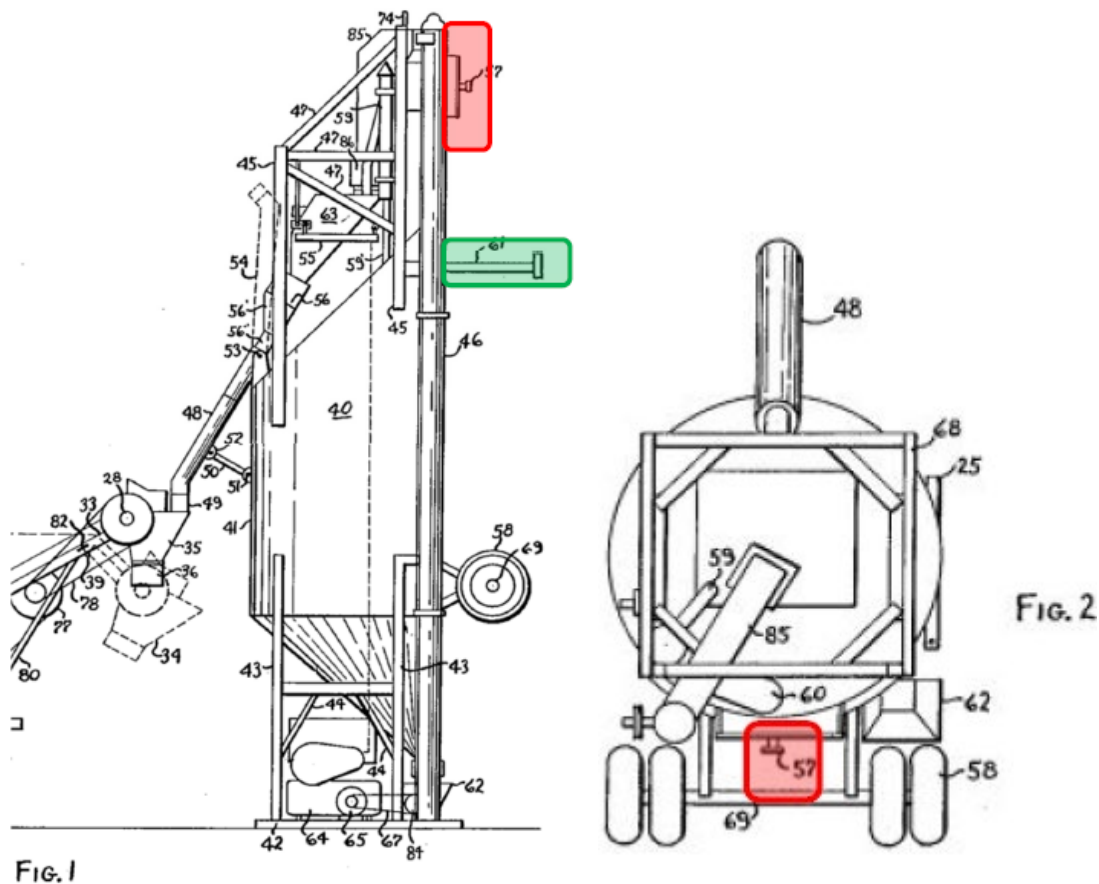
E. Ground 3 (Claims 3, 12, 21, and 25)

Claims 3 and 21 recite that the elevating assembly includes “trailer structure configured to permit the apparatus to be towed across a ground surface, the trailer structure being positioned adjacent to the ground surface when the deployable frame is in the storage position.” Independent claims 12 and 25 include that same limitation, while also reciting limitations essentially the same as independent claim 1, but adding that the trailer structure includes a “landing leg” and “kingpin” being “mounted on the deployable frame.”

Solaris challenges claims 3, 12, 21, and 25 as unpatentable for obviousness over Waldner, Dynatek, and Auld. *See* Pet. 5, 80–90. To begin, Solaris submits annotated Figure 1 of Waldner, reproduced below, to show its disclosure of a “gooseneck connection” (red) at one end of a trailer for hitching to a suitable tow vehicle. *Id.* at 82–83 (citing Ex. 1004, 12:28–51).



As shown, annotated Figure 1 of Waldner depicts trailer structure 10 equipped with “gooseneck structure 16” (red), which includes a pair of landing legs (uprights 18) configured to rest on the ground and a kingpin (hitch coupler 22) configured for attachment to a tow vehicle. *See* Ex. 1004, 12:12–34, Fig. 1. But, because Waldner lacks the claimed “landing leg” and “kingpin” being “mounted on the deployable frame” per the claims, Solaris points to Auld’s teaching of attaching the landing legs and kingpin directly to a deployable frame as opposed to a ground-based structure. *See* Pet. 83–89. More specifically, as reproduced below, Solaris annotates Figures 1 and 2 of Auld to show its disclosure of a “portable” silo that is “readily moved from place to place” and can be positioned in a vertical, operational position and a horizontal, stored position. *See id.* (citing Ex. 1009, 3:2–9); *see also* Ex. 1009, 1:8–9, 2:58–61.



Annotated Figure 1 of Auld (left-side figure) shows king pin 57 (red) and parking stand 61 (green) attached to deployable frame (base 42, columns 43, and braces 45) of the vertically-positioned cement silo 41, and annotated Figure 2 of Auld (right-side figure) shows king pin 57 when the deployable frame is in a horizontal position. Ex. 1009, 4:31–5:3. As disclosed, king pin 57 is “received in a tractor when said silo is disposed in a horizontal position for transportation.” *Id.* at 6:47–52. And parking stand 61 is attached to portion 45 of Auld’s deployable frame to be “swingable outwardly . . . to hold the silo 41 temporarily in [a] stored position when the truck is moved away from under the king pin 57.” *Id.* at 4:74–5:3.

Solaris also provides persuasive reasoning for why one of ordinary skill in the art would have incorporated the teachings of Auld in the asserted

combination of Waldner and Dynatek. *See* Pet. 80–82. For instance, Waldner discloses that gooseneck connection 16 is a “conventional” hitch-type for towing a vehicle, but expressly states that “[o]ther hitch types may alternatively be employed.” Ex. 1004, 12:28–34. As Solaris’s expert credibly testifies, that disclosure would have motivated one of ordinary skill in the art to consider “other hitch types,” such as Auld’s hitch-type, that position the king pin and parking stand on the deployable frame. Ex. 1003 ¶¶ 317–318. And, as Solaris’s expert also credibly testifies, one of ordinary skill in the art would have recognized the distinct advantages of doing so—“reducing frame material and a reduction in overall length of the trailer, and more evenly distributing the load across the towing vehicle’s bed and the trailer.” Ex. 1003 ¶¶ 319–320.

Alternatively, one skilled in the art would have been led to move Waldner’s gooseneck structure, which includes a pair of standing legs 18 and a king pin 22, to an upper portion of the elevator 50 as suggested by Auld, to gain similar advantages. Ex. 1003 ¶ 321. And one skilled in the art would have had a reasonable expectation of success in the combination given that both hitch types were well known and conventional across a broad selection of towing applications. Ex. 1003 ¶ 322.

Masaba argues that Auld is “not even analogous art.” PO Resp. 59. According to Masaba, “[t]he field of endeavor for *Auld* is mixing concrete, whereas the field of endeavor for the ’689 Patent is transferring aggregate.” *Id.* We disagree. Masaba divorces the fields of “mixing concrete” and “transferring aggregate” by ignoring Auld’s teaching of “a *combination aggregate and cement* batching plant,” which necessarily involves the transfer and mixing of aggregate materials. Ex. 1009, 1:8–29, 3:20–21 (emphasis added). Likewise, Waldner describes its field as “portable

conveyor solutions for loading of *particulate material*,” and specifically references “a mobile concrete batching system” that “accepts bulk cement from a hopper-bottom truck.” Ex. 1004, 1:14–15, 2:12–19. Based on those disclosures, we find that “a person of ordinary creativity” would deem Auld’s system sufficiently analogous to Waldner’s system so as to combine their respective teachings. *KSR Int’l.*, 550 U.S. at 421.

Notably, Masaba does not dispute that Waldner expressly instructs one of ordinary skill in the art to consider other hitch-types. Instead, Masaba debates whether Auld’s kingpin connection would more evenly distribute load on the towing vehicle or some other structure attached to it. *See* PO Resp. 62–65. But Masaba’s expert concedes that “kingpin” connections are “standard” for heavy loads and have “a plate that allows that load to be spread across the plate more evenly so the less wear.” Ex. 1113, 250:4–251:6; *see also* Ex. 1110 ¶¶ 62–64. So, one of ordinary skill in the art would understand that attaching Waldner’s king pin and upright legs to the deployable frame, as taught by Auld, would reduce the framing material and more evenly spread the load. *See* Ex. 1003 ¶¶ 320, 331, 349. Notably, Masaba’s expert never addresses this analysis and simply concludes, without evidentiary support, that one of ordinary skill in the art “would not have conceived of doing such a thing” because of inconsequential differences between Auld and Waldner (*e.g.*, “a silo is not a bucket elevator” and “Waldner’s elevator 50 is off-center relative to the wheels 28”). Ex. 2004 ¶¶ 145–146, 149. But he never explains why those alleged differences would have discouraged a skilled artisan from pursuing the asserted combination of their teachings and making any necessary adjustments, especially where they are “a person of ordinary creativity.” *KSR Int’l.*, 550 U.S. at 421; *see also* *ICON*, 496 F.3d at 1382 (“[W]e do not ignore the

modifications that [POSITAs] would make to a device borrowed from the prior art.”).

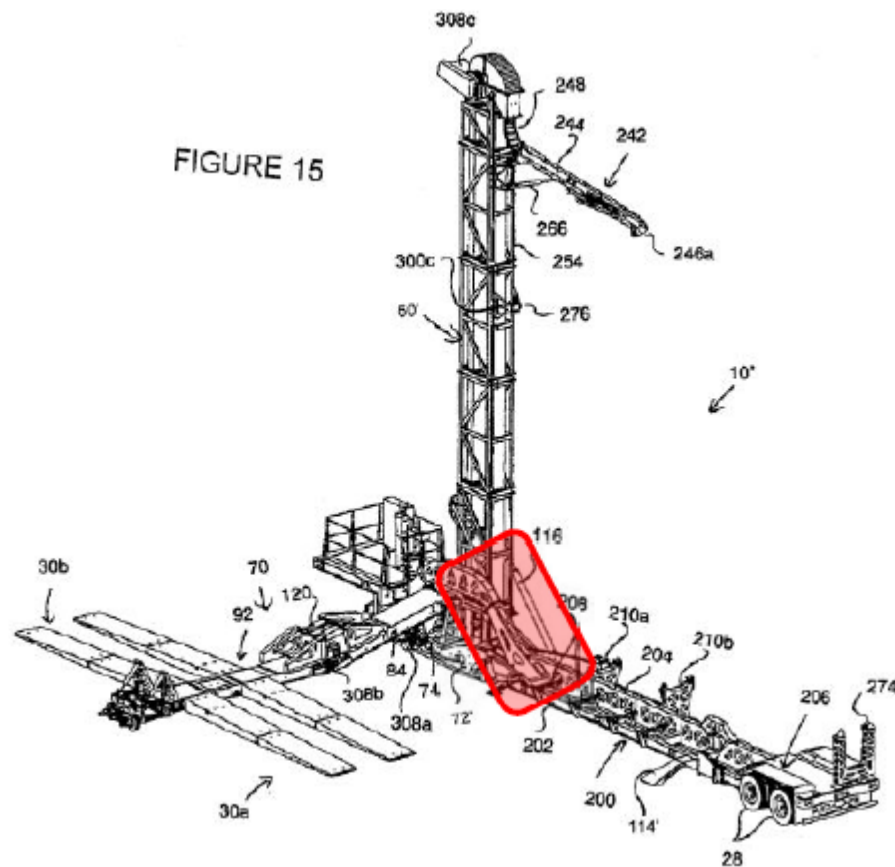
In sum, for all the above reasons, we agree with Solaris that it would have been obvious for one of ordinary skill in the art to incorporate *Auld’s* hitch-type, which positions the king pin and parking stand on the deployable frame, into the modified system of Waldner and Dynatek and/or to move *Waldner’s* gooseneck structure, which includes a pair of upright legs and a king pin, to the free end of Waldner’s deployable frame as taught by Auld. *Id.* at 87, 89 (citing Ex. 1003 ¶¶ 346–349). Aside from Solaris’s reason for combining Auld with Waldner and Dynatek, Masaba does not otherwise dispute Solaris’s showing for this ground. Having considered the parties’ arguments and the evidence of record (and incorporating our reasoning with respect to the unpatentability of claim 1), we conclude that Solaris demonstrates, by a preponderance of the evidence, that claims 3, 12, 21, and 25 are unpatentable as obvious over the combined teachings of Waldner, Dynatek, and Auld.

F. Ground 4 (Claims 13–15)

Independent claim 13 recites essentially the same claim elements as claim 1, but adds that the aggregate elevating assembly includes “a frame deployment assembly” comprising “at least one lift arm structure . . . forming a linkage between the base frame and the deployable frame” and “being articulated between opposite first and second ends of the arm structure” and also comprising “an actuator mounted on the base frame and the at least one lift arm structure to move the at least one lift arm structure.” Claims 14 and 15 depend from claim 13, but Masaba does not argue them

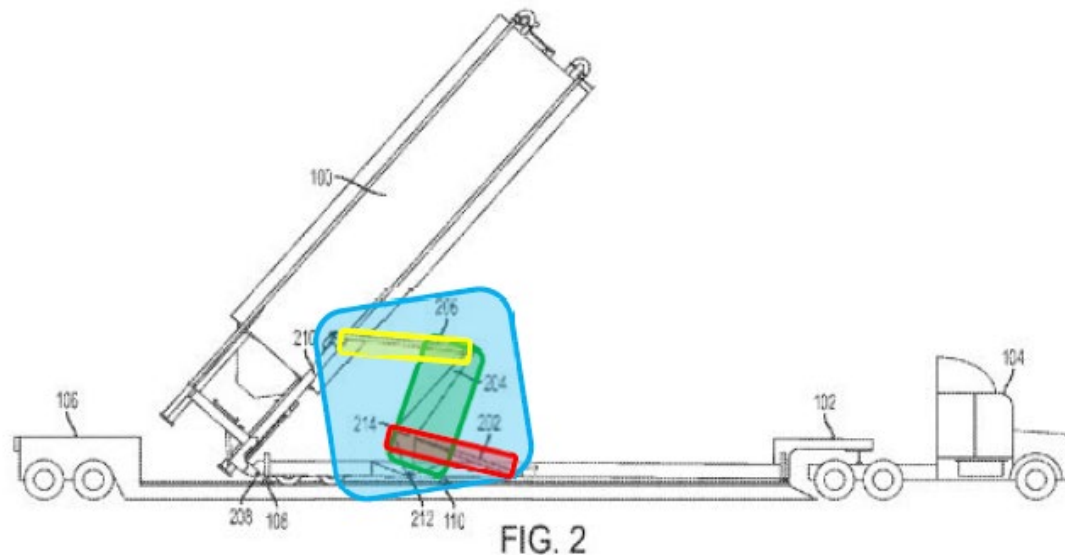
separately from claim 13. *See* PO Resp. 66–69 (disputing only Solaris’s showing for claim 13).

Solaris challenges claim 13, and its dependent claims 14 and 15, as unpatentable for obviousness over Waldner, Dynatek, and McIver. *See* Pet. 5, 91–100. To begin, Solaris annotates Waldner’s Figure 15, as reproduced below, to illustrate Waldner’s frame deployment assembly. *See* id. at 93–94 (citing Ex. 1004, Fig. 15).



As shown, annotated Figure 15 depicts two hydraulic cylinders (red) operably coupled between trailer frame 10 and bucket elevator frame 50 for deploying the elevator frame to a raised and operational position. Ex. 1004, 15:22–24, 19:25–62. But, because Waldner’s hydraulic cylinders (the claimed “actuator”) lack a “linkage” that is “articulated,” as required by claim 13, Solaris points to McIver’s teaching of just such a linkage, as shown

below in annotated Figure 2 of McIver. *See* Pet. 94–95 (citing Ex. 1011, Fig. 2).



Annotated Figure 2 of McIver depicts lift arm 204 (yellow) and lift arm 206 (green) being actuated by actuator 202 (red) to rotate silo 100 from a transportable, horizontal position to a deployable, vertical position. Ex. 1011, 8:63–9:13. With that teaching in mind, Solaris contends it would have been obvious for one of ordinary skill in the art to either replace Waldner’s hydraulic cylinders with McIver’s articulated lift arm/actuator structure (i.e., actuator 202 and arms 204 and 206) and/or to modify Waldner’s actuator structure (i.e., hydraulic cylinders 116) to incorporate an articulated lift arm structure, as taught by McIver, in order to make the deployment structure “more compact” while also providing “a longer range of motion.” Ex. 1003 ¶¶ 372–377, 392–396.

Masaba responds with two arguments against Solaris’s showing. *See* PO Resp. 66–69. First, Masaba disputes Solaris’s reason for combining McIver with Waldner and Dynatek—that replacing Waldner’s cylinders 116 with McIver’s actuator 202 and arms 204/206 would result in the modified

combination being “more compact.” *Id.* at 66–67. But Masaba ignores Solaris’s reason for undertaking the combination. As Solaris’s expert explains, the advantage of McIver’s deployment structure is that it folds to be more compact *while also adding a longer range of motion* than Waldner’s deployment structure. *See* Ex. 1003 ¶ 373. And, although Masaba’s expert notes differences between Waldner’s structure and McIver’s structure, he ignores their common features but never actually rebuts the benefit of incorporating McIver’s teachings in Waldner. *See* Ex. 2004 ¶ 173.

Masaba also contends that McIver’s “rocker arm 204” is “one integral structure, not two connected structures that move relative to one another,” and, hence, is not “articulated” per claim 13. PO Resp. 68–69. That argument fails for the simple reason that Solaris relies on McIver’s lift arm 204 *and* lift arm 206 as constituting the claimed “articulated” linkage. *See* Pet. 95. And, indisputably, McIver’s two lift arms 204 and 206 are connected to pivot relative to one another, as even Masaba’s own expert acknowledges. *See* Ex. 1113, 264:4–265:6 (acknowledging that “articulated” means “two connected parts that move relative to one another”), 267:7–22 (agreeing that the connection between McIver’s rocker arm 204 and second arm 206 is a “pivot point”). Thus, we reject the notion that McIver lacks teaching an “articulated” lift arm structure, as claimed.

Aside from those two arguments, Masaba does not otherwise dispute Solaris’s showing for this ground. Having considered the parties’ arguments and the evidence of record (and incorporating our reasoning with respect to the unpatentability of claim 1), we conclude that Solaris demonstrates, by a preponderance of the evidence, that claims 13–15 are unpatentable as obvious over the combined teachings of Waldner, Dynatek, and McIver.

G. Grounds 1A, 2A, 3A, and 4A

Solaris also challenges claims 1–25 on the same four grounds discussed above, but with the addition of Sleeman. *See* Pet. 64–75 (Ground 1A), 80 (Ground 2A), 90–91 (Ground 3A), and 100–101 (Ground 4A). In doing so, Solaris relies on Sleeman to overcome any shortcomings in the position of Waldner’s discharge chute “when the system is placed in its collapsed (transport) position.” *Id.* at 64. Otherwise, Solaris acknowledges that “*Sleeman* and *Waldner* disclose systems with numerous similarities that are directed to solving essentially the same problems.” *Id.*

Masaba does not raise the issue of the collapsed (transport) position of Waldner’s discharge chute. *See* PO Resp. 49 (“Waldner’s chute is *not* detached when the system is in its collapsed/transport position.”). Instead, Masaba notes the similarities between Sleeman and Waldner and argues “Ground 1A fails for the same reasons as Ground 1” because “*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.” *Id.* at 49–50. Masaba also makes the same arguments that we already addressed above for the other grounds. *See, e.g., id.* at 50 (“Solaris’s motivations for adding *Sleeman* to the *Waldner*/*Dynatek* combination mimic those for combining *Dynatek* with *Waldner* and fail for the same reasons.”).

Accordingly, for the same reasons discussed above for Grounds 1, 2, 3, and 4, we determine Solaris has shown that the challenged claims of Grounds 1A, 2A, 3A, and 4A would have been obvious based on the asserted combinations of art in those grounds with the addition of Sleeman.

III. OUTSTANDING MOTIONS

A. Solaris's Motion to Exclude

Solaris moves to exclude Exhibit 2037 from consideration in this proceeding. *See* Pet. Mot. 1. Exhibit 2037 is a 95-page document that includes an “Amended Complaint and Jury Demand” from the parallel litigation, as well as several attachments in the form of claim charts and annotated images prepared in the context of that litigation. *Id.* Masaba relies on Ex. 2037 to show that Solaris’s system embodies the claims of the ’689 patent so as to establish nexus of certain secondary considerations. *See* PO Resp. 72. Although we reviewed Exhibit 2037 in considering Masaba’s evidence of secondary considerations, we nonetheless decided that Masaba failed to establish the requisite nexus. Thus, we deny Solaris’s motion as moot.

B. Masaba's Motion to Strike

Masaba moves to strike portions of Exhibit 1111, which is a declaration from David Smith as proffered by Solaris. *See* PO Mot 1. Masaba also seeks to strike certain exhibits on which that testimony relies, namely, Exhibits 1131–1134, 1141–1149, and 1151. *Id.* We do not rely on any of those exhibits. Thus, we deny Masaba’s motion to strike as moot.

IV. CONCLUSION

Claims	35 U.S.C. §	Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 4–11, 16–20, 22–24	103	Waldner, Dynatek	1, 2, 4–11, 16–20, 22–24	
1, 2, 4–11, 16–20, 22–24	103	Waldner, Dynatek, Sleeman	1, 2, 4–11, 16–20, 22–24	
6, 7	103	Waldner, Dynatek, Pham	6, 7	
6, 7	103	Waldner, Dynatek, Pham, Sleeman	6, 7	
3, 12, 21, 25	103	Waldner, Dynatek Auld	3, 12, 21, 25	
3, 12, 21, 25	103	Waldner, Dynatek, Auld, Sleeman	3, 12, 21, 25	
13–15	103	Waldner, Dynatek, McIver	13–15	
13–15	103	Waldner, Dynatek, McIver, Sleeman	13–15	
Overall Outcome			1–25	

V. ORDER

Accordingly, it is:

ORDERED that claims 1–25 of US 11,780,689 B1 have been shown to be unpatentable under 35 U.S.C. § 103;

FURTHER ORDERED that claims 1–25 of US 11,780,689 B1 are *cancelled*;

FURTHER ORDERED that Solaris’s Motion to Exclude is *denied*;

FURTHER ORDERED that Masaba’s Motion to Strike is *denied*; and

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

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