

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FREIGHTCAR AMERICA, INC.,
Petitioner,

v.

NATIONAL STEEL CAR LIMITED,
Patent Owner.

IPR2025-01046
Patent 8,166,892 B2

Before HYUN J. JUNG, NEIL T. POWELL, and
RICHARD H. MARSCHALL, *Administrative Patent Judges*.

POWELL, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. BACKGROUND

FreightCar America, Inc. (“Petitioner”) filed a Petition for *inter partes* review of claims 1–15 of U.S. Patent No. 8,166,892 B2 (Ex. 1001, “the ’892 patent”). Paper 1 (“Pet.”). National Steel Car Limited (“Patent Owner”) filed a Preliminary Response. Paper 10 (“Prelim. Resp.”). We authorized Petitioner to file a Preliminary Reply and Patent Owner to file a Preliminary Sur-Reply. Paper 18 (“Prelim. Reply”); Paper 22 (“Prelim. Sur-reply”).

After the Petition was filed, Patent Owner statutorily disclaimed claim 1 of the ’892 patent. Prelim. Sur-reply 2; Ex. 2046.

We have authority to determine whether to institute an *inter partes* review. *See* 35 U.S.C. § 314; 37 C.F.R. § 42.4(a). To institute an *inter partes* review, we must determine that the information presented in the Petition and the Preliminary Response shows “a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). For the reasons set forth below, we determine that there is a reasonable likelihood that Petitioner will prevail with respect to at least one challenged claim. We institute an *inter partes* review of claims 2–15 based on the Petition’s grounds challenging those claims.

B. RELATED PROCEEDINGS

The parties identify *National Steel Car Limited v. FreightCar America, Inc.*, 1:24-cv-00594-JLH (D. Del.) as a related matter. Pet. 131–32; Paper 3, 2. Patent Owner also identifies IPR2025-01047 and IPR2025-01048. Paper 3, 2.

C. THE '892 PATENT

The '892 patent relates to railroad freight cars. Ex. 1001, 1:14. In particular, the '892 patent discusses cars with an upper opening for loading particulate matter and a lower door for releasing the particulate matter. *Id.* at 1:22–26. The '892 patent shows an embodiment of such a car in Figure 1, which is reproduced below.

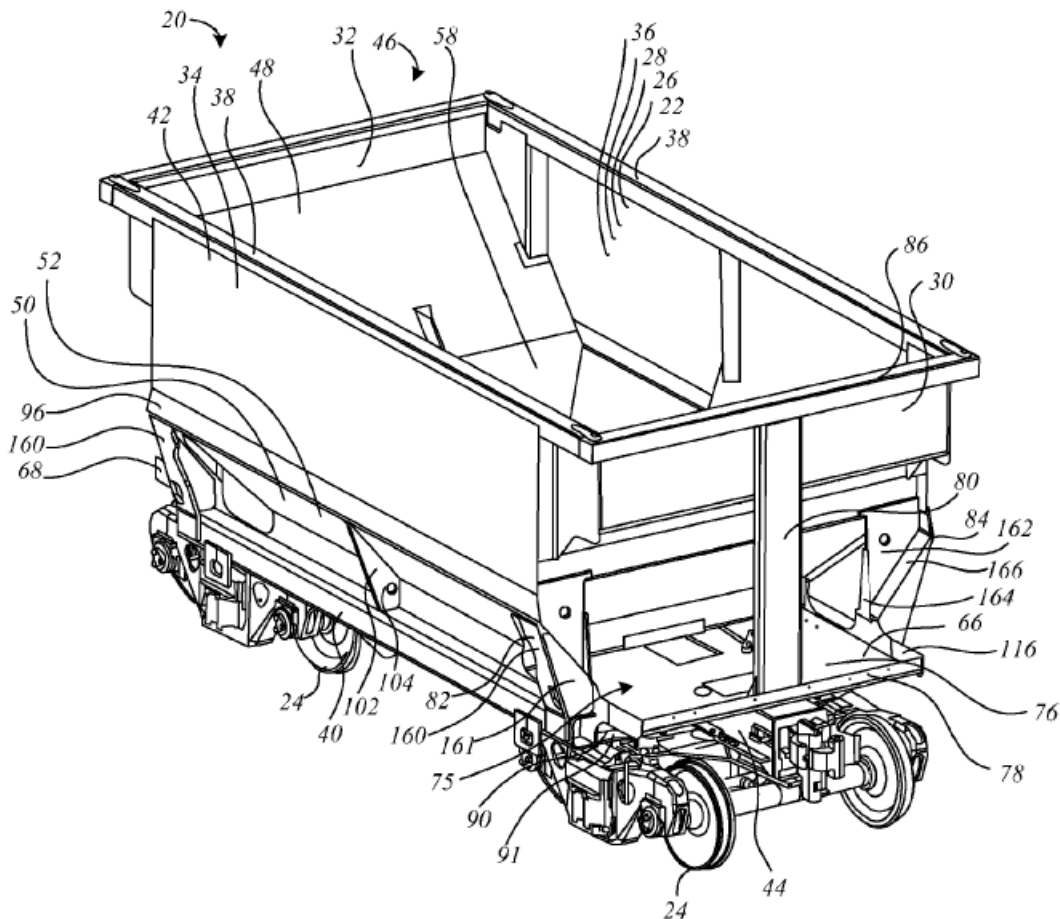


Figure 1

Figure 1 shows an isometric view of rail road freight car 20, which “may be a hopper car such as may be used for the carriage of bulk commodities in the form of a granular particulate.” *Id.* at 12:29–30, 12:40–42. Freight car 20 includes “a car body 22 that is carried on trucks 24 for rolling operation along railroad tracks.” *Id.* at 12:50–52.

third or bottom portion, namely bottom flange, or leg, or margin 100 that extends in a substantially vertical plane downwardly.

Id. at 15:13–21.

The sidewall “also includes a central post, or web stiffener, 102 that has a lowermost first portion 104[,], an intermediate second portion 106, and an uppermost third portion 108.” Ex. 1001, 15:21–24. Portion 104 “stands outboard of the sidewall sheet.” *Id.* at 15:32–33. Portion 104 has an edge welded to sloping portion 98 of lower portion 94 of side sheet assembly 42. *Id.* at 15:27–31. Portion 108 “extends downwardly from, the underside of top chord 38 along the inside face of vertical web portion 92.”

Id. at 15:34–36. Intermediate portion 106 is welded to portion 108’s lower margin and member 94’s sloped portion 98. *Id.* at 15:36–42. “Portions 104 and 106 are co-planar, or substantially co-planar, such that stiffener 102 has web continuity through member 94.” *Id.* at 15:44–46. The construction shown in Figure 2c “presents a continuous sloped surface for containing, and then slidingly discharging, particulate lading”:

the web of the sidewall traverses the sidewall stiffener, commencing on its inboard margin at side sill 40, traverses the web mid-way up the post, and ends along its outboard margin at top chord 38. In this arrangement, the vertical stiffener, 102, acts as the web of a T-section, and the local region of the wall section to which it is joined functions as the flange of that T-section.

Id. at 15:44–57.

For holding and releasing particulate lading, rail car 20 has moveable doors, as shown below in Figure 4a. Ex. 1001, 10:57–59, 13:20–24, 13:55–58, 18:1–2, 18:25–29.

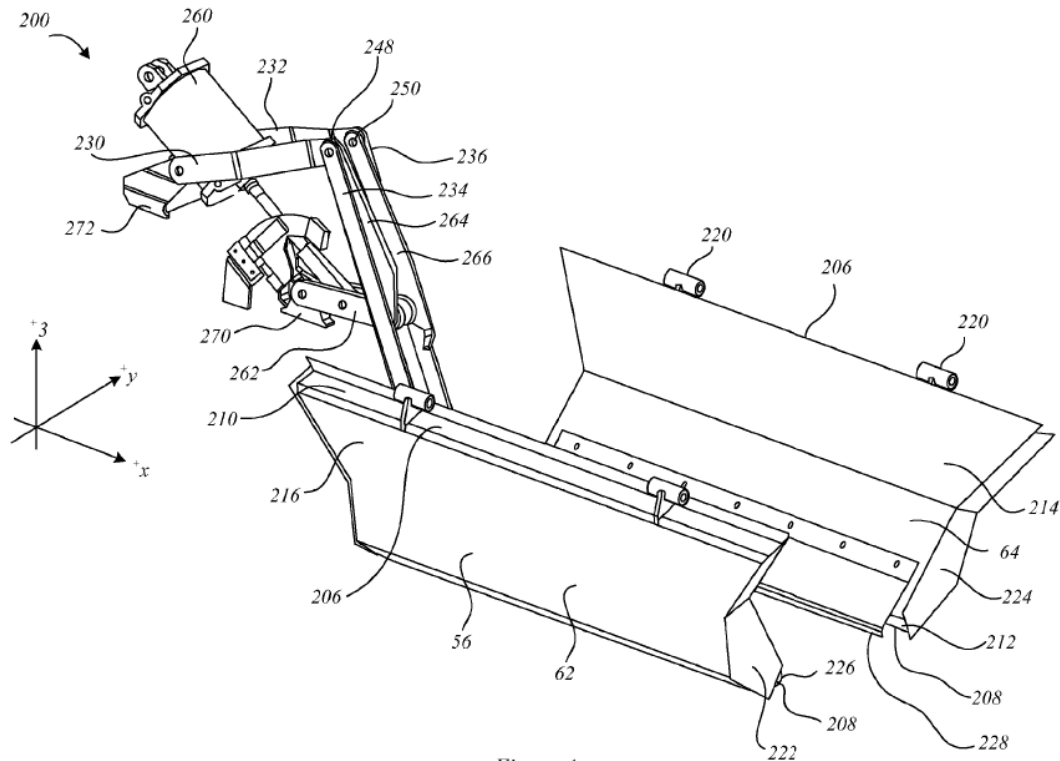


Figure 4a

Figure 4a provides an “isometric view of a portion of the door opening mechanism for the railroad car of [Figure] 1 in a fully open position.”

Id. at 10:57–59.

Specifically, Figure 4a shows door opening mechanism 200, which includes first and second doors 62, 64, actuator 260, and various links for lifting doors 62, 64. Ex. 1001, 18:1–2, 18:18–29, 19:4–5. Doors 62, 64 move in circular arcs about “hinge axes of their respective hinges 220.” *Id.* at 18:29–33. Door actuator 260 provides the system’s driving force. *Id.* at 19:4–5.

The ’892 patent shows end wall 30 in detail in Figure 3a, which is reproduced below.

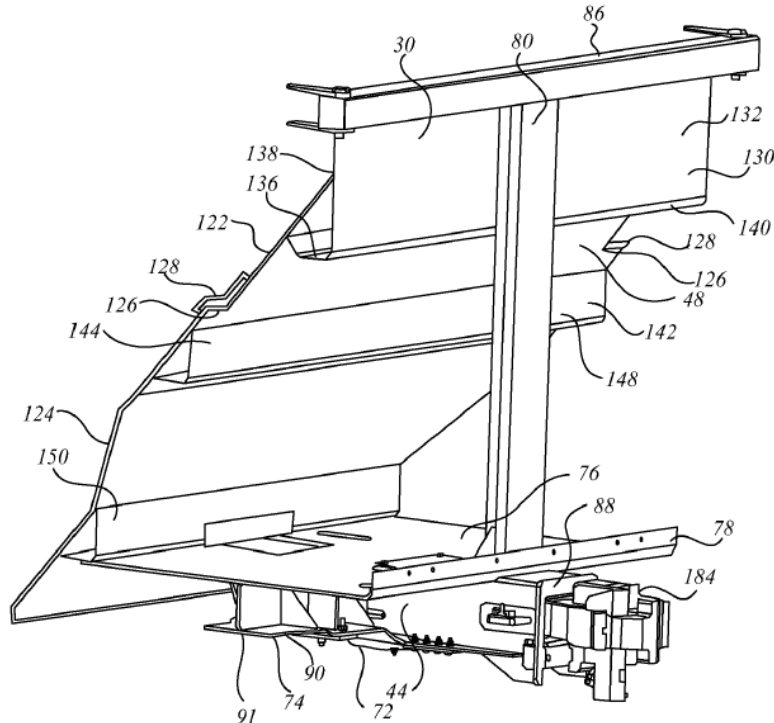


Figure 3a

Figure 3a “shows a perspective view of the end structure of the railroad freight car of [Figure] 1.” *Id.* at 10:51–52.

As shown in Figure 3a, end wall 30 has “upper and lower sloped surface members 122 and 124.” Ex. 1001, 16:29–30. “[A] substantially triangular closed section defin[es] a laterally extending end slope sheet reinforcement beam,” as follows:

At the upper end of end wall 30 the end wall assembly includes a laterally extending first formed member 130 that has a first, vertical leg 132 that laps the inside face of the top chord 86, and a bent flange 136 that extends initially horizontally, with a distal lip bent upward to mate perpendicularly with the upper margin 138 of the end slope sheet 48. The distal tip of end slope sheet 48 is fillet welded to vertical leg 132.

Id. at 16:36–45.

D. ILLUSTRATIVE CLAIMS

Of the challenged claims remaining after Patent Owner’s disclaimer of claim 1, only claim 2 is independent. Each of claims 3–15 depends, directly or indirectly, from independent claim 2. Claim 2 is illustrative for our analysis herein and is reproduced below with certain reformatting:¹

2. [2a] A rail road hopper car comprising:

a hopper carried between a first end section and a second end section;

said first and second end sections being carried by respective first and second trucks for rolling motion in a longitudinal direction along railroad tracks;

[2b] said hopper having first and second upstanding sidewalls running lengthwise therealong;

[2c] said hopper having a lower discharge and convergent slope sheets that slope downward toward said discharge;

[2d] said discharge having a door movable between a closed position and an open position to govern egress of lading from said hopper;

[2e] one of said convergent slope sheets being a first end slope sheet;

said first end slope sheet extending laterally between said first and second upstanding sidewalls;

said first end slope sheet having a first, lower, longitudinally inboard end proximate said discharge, and a second, upper, longitudinally outboard end distant from said discharge;

[2f] said first end section having a first draft sill and a main bolster extending cross-wise to said first draft sill, said first draft sill and said main bolster intersecting at a first

¹ We have added the same labels that Petitioner uses to identify portions of claim 2. *See, e.g.*, Pet. 2–5.

truck center, said first truck being located centrally under said first truck center;

[2g] said draft sill having a striker longitudinally outboard of said first truck center;

[2h] said first end section having a shear plate mounted overtop of said first draft sill and said main bolster;

said shear plate having a longitudinally inboard margin adjacent to said longitudinally inboard end of said first end slope sheet;

said shear plate having a longitudinally outboard cross-wise running margin traversing said draft sill longitudinally outboard of said truck center;

[2i] said upper, longitudinally outboard end of said first end slope sheet being reinforced by a first cross-wise extending beam;

[2j] said lower, longitudinally inboard end of said first end slope sheet being reinforced by a second cross-wise extending beam;

[2k] said first end slope sheet overhanging said shear plate;

[2l] a door actuator mounted above said shear plate, said door actuator being at least partially overhung by said first end slope sheet;

said door actuator being connected to said door by a mechanical transmission;

[2m] said first end section being free of longitudinally oriented elephant ears extending between said draft sill and said first end slope sheet;

[2n] said hopper having respective first and second top chords running longitudinally therealong;

said car having respective first and second side sills running longitudinally between said first and second end sections;

[2o] said first upstanding sidewall having a predominantly upwardly running sidewall stiffener mounted thereto, said

sidewall stiffener being located at a longitudinal station intermediate the trucks;

[2p] said first upstanding sidewall having a first region, said first region being a lower region thereof;

said first upstanding sidewall having a second region, said second region being an upper region thereof;

[2q] said first and second regions of said sidewall adjoining each other at a height intermediate said first side sill and said first top chord;

said second region of said sidewall extending downwardly or said first top chord;

said first region of said sidewall extending downwardly and laterally inboard from said second region of said sidewall;

[2r] said sidewall stiffener having a first portion, said first portion being a lower portion thereof, said first portion being mounted to said first region of said first upstanding sidewall;

said sidewall stiffener having a second portion, said second portion being an upper portion thereof, said second portion being mounted to said second region of said first upstanding sidewall;

[2s] said first portion of said first upstanding sidewall stiffener being laterally outboard of said first region of said first upstanding sidewall;

said second portion of said sidewall stiffener being laterally inboard of said second region of said first upstanding sidewall;

[2t] said first sidewall having a continuous section between said first and second regions thereof; and

[2u] said sidewall stiffener having web continuity between said first and second portions thereof.

Ex. 1001, 23:38–24:60.

E. ASSERTED PRIOR ART AND PROFFERED TESTIMONIAL EVIDENCE

Petitioner identifies the following references as prior art in the asserted grounds of unpatentability:

Name	Reference	Exhibit
1946 Cyclopedia	1946 Car Builders' Cyclopedia, (Roy V. Wright ed., 17th ed., 1946)	1004, 1054 ²
Lindström	US 1,321,928, issued Nov. 18, 1919	1005
Wong	US 4,941,411, issued July 17, 1990	1006
Coates	Excerpts from <i>Lancashire & Yorkshire</i> , Vol. 2, Noel Coates, 2006.	1007

Petitioner also relies on a Declaration of Dr. Mehdi Ahmadian. Pet. 16–17; Ex. 1003. Patent Owner provides a Declaration of Mark J. Viz, Ph.D., P.E. Ex. 2035.

F. ASSERTED GROUNDS

The Petition asserted that claims 1–15 would have been unpatentable on the following grounds (Pet. 8):

Ground	Claims Challenged	35 U.S.C. § ³	References
1a ⁴	1	102(b), 103(a)	1946 Cyclopedia
1b	2–8, 10–14	103(a)	1946 Cyclopedia, Lindström, Wong
1c	9	103(a)	1946 Cyclopedia, Lindström, Wong
1d	15	103(a)	1946 Cyclopedia, Lindström, Wong, Coates

² As discussed below in Section II.C, Petitioner submitted a first copy of the 1946 Cyclopedia as Exhibit 1004 and a second, higher-resolution copy of the 1946 Cyclopedia as Exhibit 1054.

³ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”) included revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. The ’892 patent has a filing date of September 14, 2009. Ex. 1001, code (22). Accordingly, we apply the pre-AIA version of §§ 102, 103.

⁴ Because Patent Owner statutorily disclaimed claim 1, this ground is moot.

Ground	Claims Challenged	35 U.S.C. § ³	References
2a ⁵	1	102(b), 103(a)	Lindström, 1946 Cyclopedia
2b	2–14	103(a)	Lindström, 1946 Cyclopedia, Wong
2c	15	103(a)	Lindström, 1946 Cyclopedia, Wong, Coates

II. ANALYSIS

A. LEVEL OF ORDINARY SKILL

Petitioner contends that a person of ordinary skill in the art “would have had at least a bachelor’s degree in a discipline related to mechanical engineering, physics, structural design, or an equivalent discipline, and at least two years of experience designing or analyzing rail cars or similar vehicles.” Pet. 16 (citing Ex. 1003 ¶ 30).

Patent Owner responds that Petitioner’s proposed level of ordinary skill in the art is incorrect, “because design or analysis experience with other industrial wheeled vehicles would not necessarily be applicable to the art of the ’892 Patent.” Prelim. Resp. 12 (citing Ex. 2035 ¶¶ 38–39). According to Patent Owner, a person of ordinary skill in the art “would have at least a bachelor’s degree in a discipline related to mechanical engineering, physics, structural design, or an equivalent discipline, and at least two years of experience designing or analyzing rail cars.” *Id.* (citing Ex. 2035 ¶¶ 34, 38).

The parties agree that one of ordinary skill in the art “would have had at least a bachelor’s degree in a discipline related to mechanical engineering, physics, structural design, or an equivalent discipline, and at least two years

⁵ Because Patent Owner statutorily disclaimed claim 1, this ground is moot.

of experience designing or analyzing rail cars.” Pet. 16; Prelim. Resp. 12. Patent Owner, however, disagrees that the experience should include designing or analyzing “similar vehicles.” Prelim. Resp. 12.

At this stage, for the reasons below, limiting the ordinary skill in the art to “at least two years of experience designing or analyzing rail cars” does not affect our analysis of the parties’ dispute or our determination that there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. Thus, based on the preliminary record, we adopt Petitioner’s proposed level of ordinary skill to determine whether review should be instituted.

Patent Owner also argues that Petitioner’s declarant does not have “actual industry experience with railcar structures” and, thus, “makes the wrong conclusions and conflates various concepts that a [person of ordinary skill in the art] with practical industry experience and knowledge would not.” Prelim. Resp. 12–13 (citing Ex. 2035 ¶ 39). For the reasons discussed below, in our preliminary analysis, we give credit to the cited testimony of Petitioner’s declarant, because it finds support in the relied-upon portions of the record.

B. CLAIM CONSTRUCTION

In an *inter partes* review, the claims are construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b); *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Petitioner proposes no interpretation for any claim term and contends that “[t]he challenged claims are unpatentable under any reasonable construction.” Pet. 16.

Patent Owner responds that, for its Preliminary Response, no construction is required to deny institution. Prelim. Resp. 14. Patent Owner contends ordinary and customary meaning in view of the Specification and prosecution history is sufficient. *Id.*

At this stage, we need not construe expressly any claim term to resolve the parties’ dispute regarding whether Petitioner has demonstrated a reasonable likelihood of prevailing on at least one challenged claim.

Realtime Data, LLC v. Iancu, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms that . . . are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))

C. GENERAL DISPUTE REGARDING THE 1946 CYCLOPEDIA

In its Preliminary Response, Patent Owner suggested that the 1946 Cyclopedia lacks as much detail as shown in excerpts from the 1946 Cyclopedia included in the Petition and Dr. Ahmadian’s Declaration. Prelim. Resp. 20–21. In response to this, Petitioner filed an authorized Motion to Correct Exhibit 1004, providing evidence that the copy of the 1946 Cyclopedia in Exhibit 1004 suffered from poor resolution due to a clerical error. Paper 17 (“Motion”). We granted Petitioner’s Motion, ordering Petitioner to file a higher-resolution copy of the 1946 Cyclopedia. Paper 24 (“Order”). Pursuant to our Order, Petitioner has filed a higher-resolution copy of the 1946 Cyclopedia as Exhibit 1054. As noted in our Order, if Patent Owner has evidentiary concerns regarding the newly filed copy of the 1946 Cyclopedia, Patent Owner may address those during trial,

Otherwise, Exhibit 1054 appears to remedy the concerns underpinning Patent Owner's argument that the 1946 Cyclopedia lacks the details shown in the Petition and Dr. Ahmadian's declaration. As noted in our Order, all citations to Exhibit 1004 in documents currently of record shall be treated as also citing to Exhibit 1054. *Id.* at 8.

D. GROUND 1B—ALLEGED OBVIOUSNESS OVER THE 1946 CYCLOPEDIA, LINDSTRÖM, AND WONG

1. Overview of the 1946 Cyclopedia

The 1946 Cyclopedia has “Definitions and Typical Illustrations of Railroad and Industrial Cars, Their Parts and Equipment.” Ex. 1004, 2; Ex. 1054, 2. Figure 2,670 of the 1946 Cyclopedia is reproduced below.

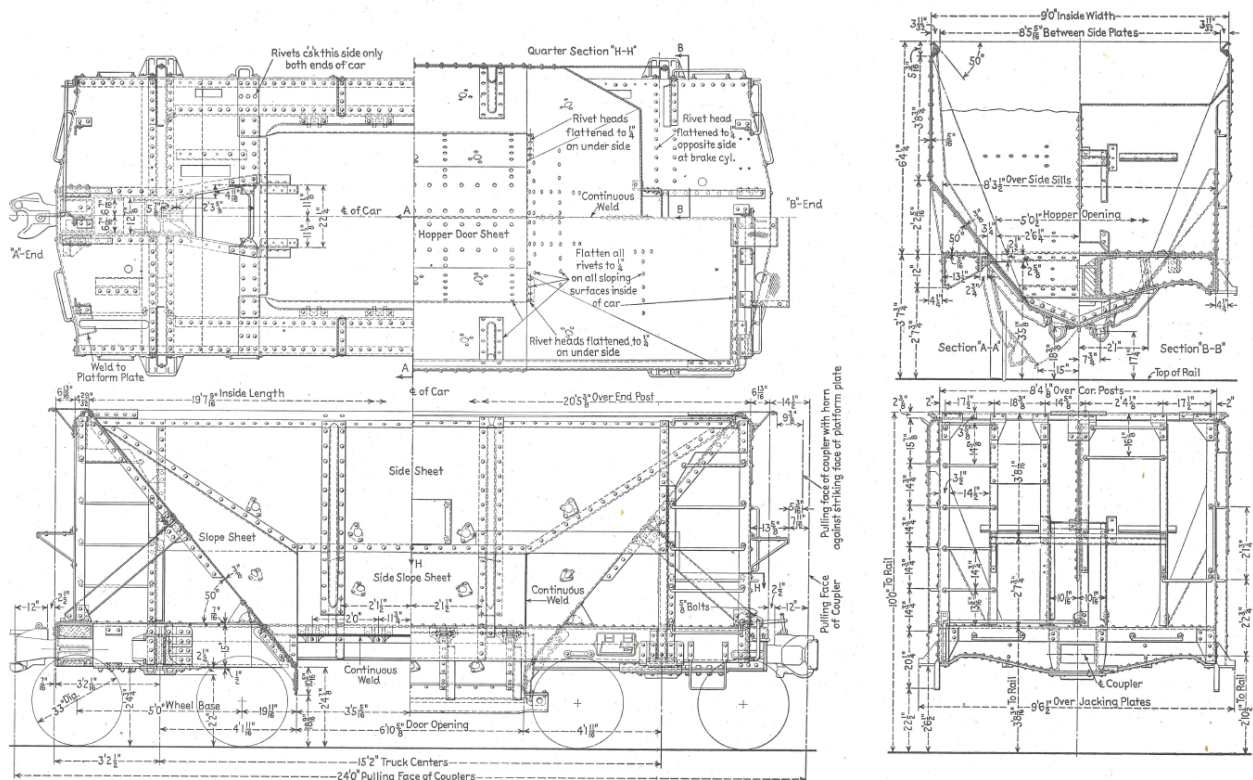


Fig. 2,670—Plan, elevation and sections of Canadian Pacific 50-Ton center discharge ore car.

Builder, National Steel Car Corporation, Ltd.

Series 114,100-114,349
(See also Fig. 2.673)

Figure 2,670 shows “[p]lan, elevation and sections of Canadian Pacific 50-Ton center discharge ore car.” Ex. 1004, 27; Ex. 1054, 27.

2. Overview of Lindström

Lindström discusses “dumping cars and door gears therefor.” Ex. 1005, 1:11–13. An embodiment of such a car appears in Figure 2, which is reproduced below.

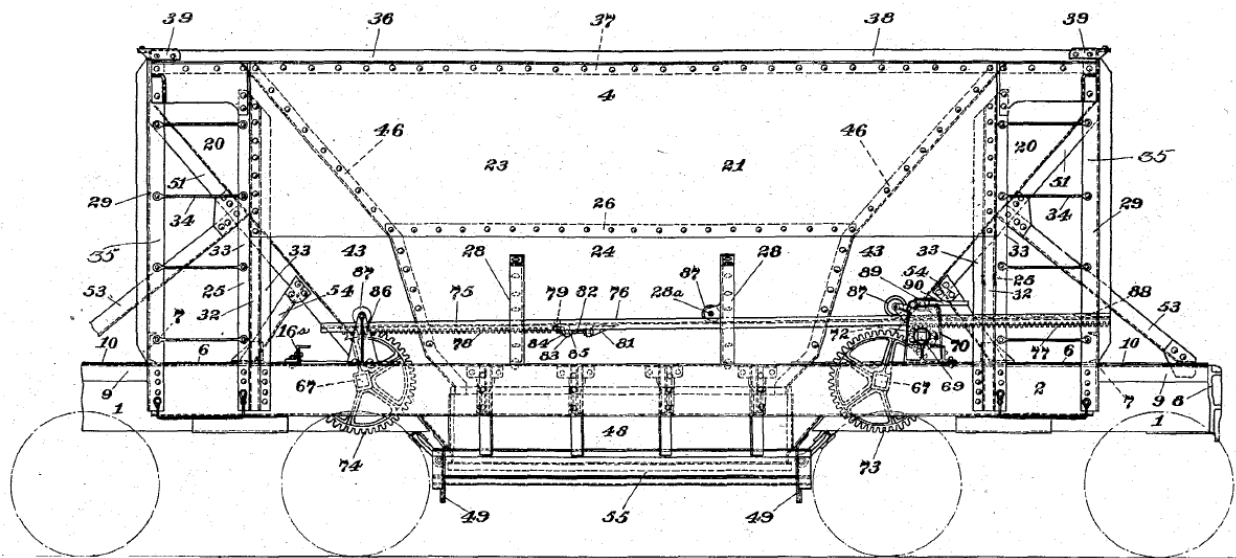


Fig. 2.

Figure 2 “is a side elevational view of the car.” *Id.* at 1:53–54.

The car includes draft sills 1, 1; side sills 2, 2; bolsters 3, 3; and car body 4, 4. Ex. 1005, 1:81–83. “The side sills 2, 2, draft sills 1, 1 and bolster 3, at each end of the car, are connected together by a member 6 which is preferably in the form of a horizontally extending flat plate, thus forming a strong and rigid end framing.” *Id.* at 1:90–95.

Car body 4 includes “sloping end floors 20, 20, and combined side walls and sloping floors 21, 21, some times herein referred to as sloping side floors, which are formed and connected together in such a manner as to permit of the free discharge of the lading the single central unobstructed

discharge opening.” Ex. 1005 2:50–59. “[D]oors 48, 48 are preferably hinged at the sides of the car.” *Id.* at 3:107–108.

The car also includes a mechanism for operating doors 48. Ex. 1005, 4:43–45. The mechanism includes a beam 55 for each discharge door and operating shaft 69. *Id.* at 4:64–65, 5:36–40. Operating shaft 69 is connected to each beam 55 through pinion 72, shaft 67, and various other components of the mechanism, including clutches, gears, crank arms, and yokes. *Id.* at 4:68–72, 4:80–86, 4:118–121, 5:36–54. For holding shaft 69 stationary, “a toothed member 88 is provided which is mounted on the rack 75 and which may be engaged by a pawl 89 pivotally mounted on the member 70 above the rack 75. This pawl 89 is adapted to be engaged by a cranked portion of a rod 90.” *Id.* at 5:97–104. To open or close doors 48, a user may move rod 90 to disengage pawl member 89 from toothed member 88, followed by using a wrench or crank to operate shaft 69. *Id.* at 5:109–6:5.

3. *Overview of Wong*

Wong discloses a “covered hopper railcar.” Ex. 1006, code [57]. Reproduced below is Figure 4 of Wong.

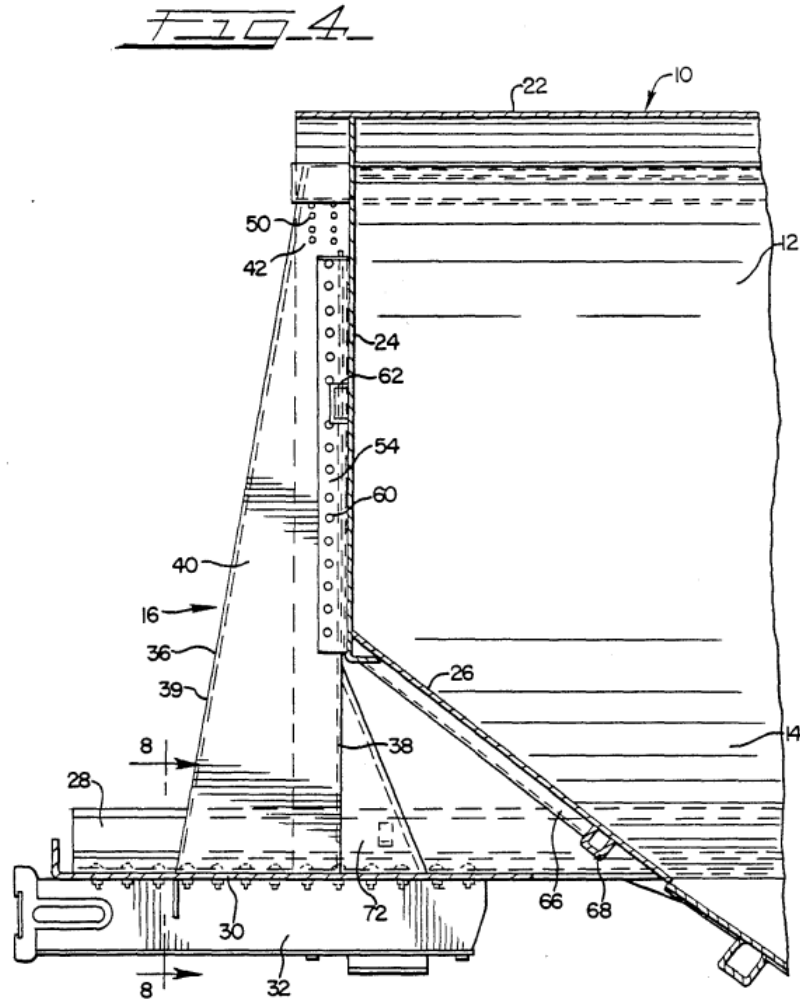


Figure 4 “is a cross-sectional view” of an end of a railcar. *Id.* at 2:47–48. Railcar 10 includes conventional body portion 12 that defines hopper 14. *Id.* at 3:9–10. Railcar 10 also has end structural assembly 16 at either end. *Id.* at 3:10–12.

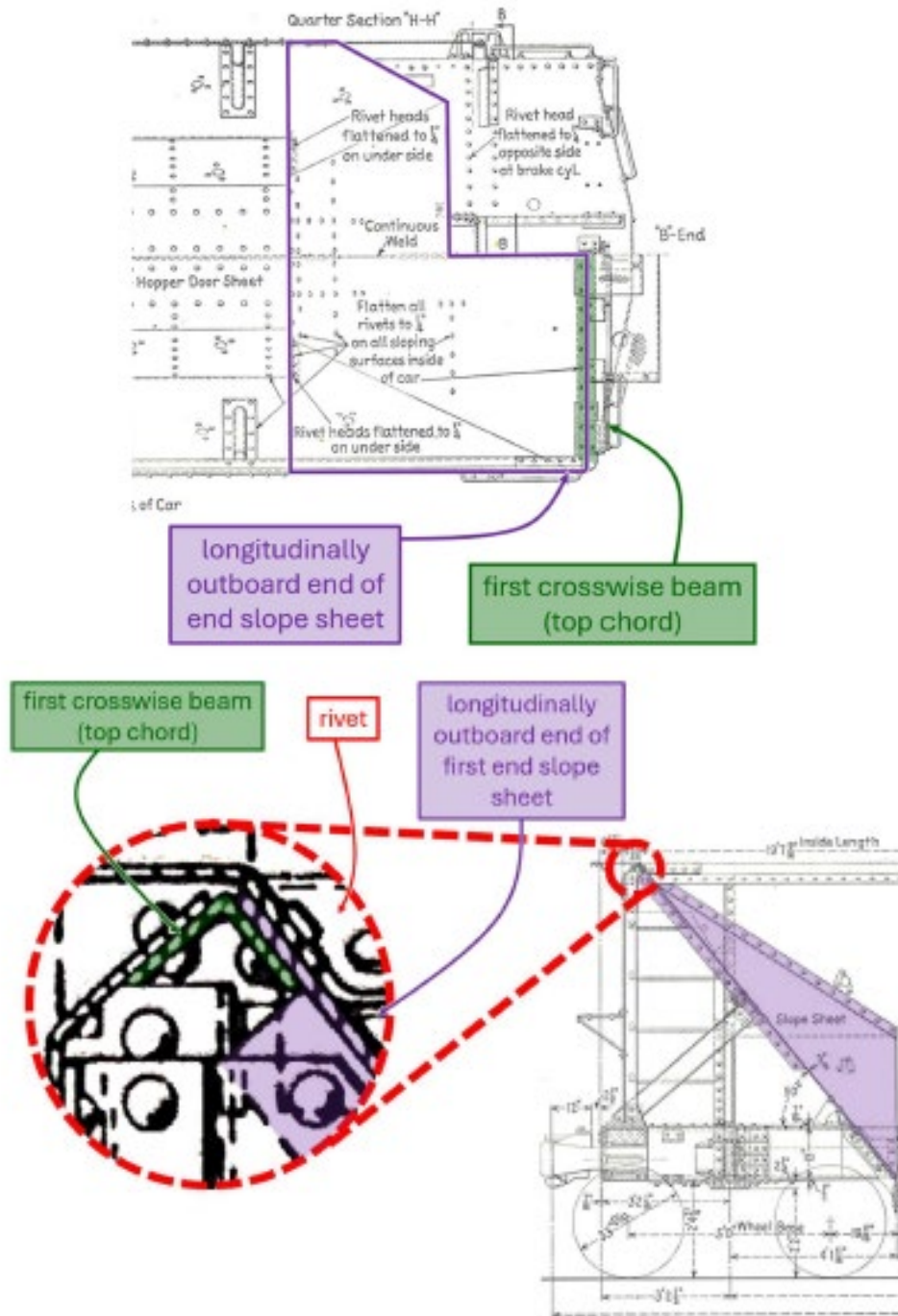
Body portion 12 includes side sheets 18, 20, top sheet 22, end sheets 24, and end slope sheets 26. Ex. 1006, 3:15–16. Side sheets 18, 20, top sheet 22, and end sheets 24 “are of aluminum construction and are attached to one another in a well-known manner so as to define body portion 12.” *Id.* at 3:16–20.

4. *Discussion*

In asserting obviousness of claims 2–8 and 10–14 over the 1946 Cyclopedia, Lindström, and optionally Wong, Petitioner cites the 1946 Cyclopedia as allegedly disclosing most limitations of the challenged claims. Pet. 34–75. Petitioner cites Lindström when addressing limitation [2l] and dependent claim 6. *Id.* at 56–59, 68–71. Petitioner cites Wong when addressing limitation [2i]. *Id.* at 50–53. Patent Owner argues that Petitioner has not sufficiently addressed limitations [2i], [2l], [2u], and certain limitations in dependent claims. Prelim. Resp. 26–45. Having reviewed all of the parties’ arguments and evidence, we find Petitioner has shown a reasonable likelihood of prevailing at least on its challenge of independent claim 2 as obvious over the 1946 Cyclopedia, Lindström, and optionally Wong. Pet. 34–64; Prelim. Resp. 26–34. We turn next to detailed discussions of the parties’ disputes regarding limitations [2i], [2l], [2u], followed by other matters.

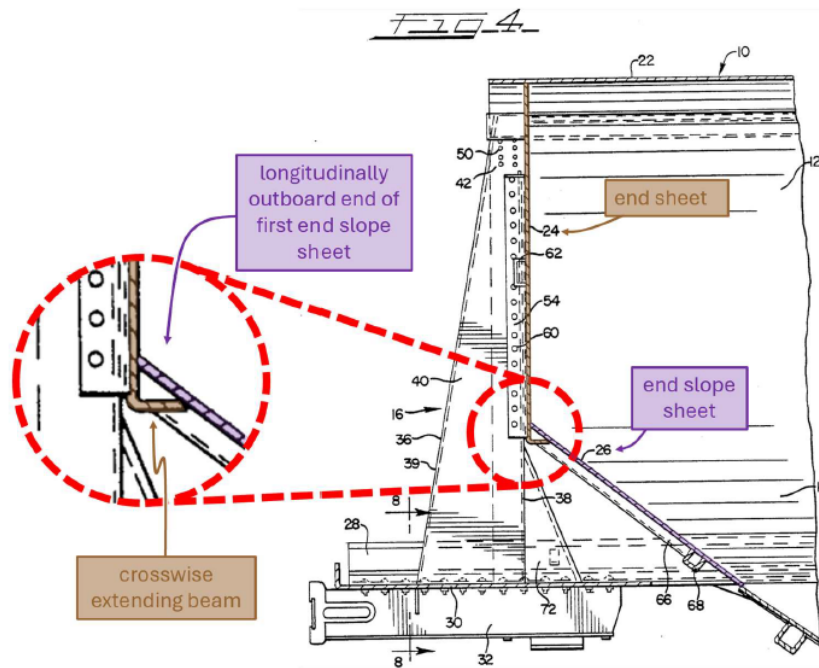
a) *Limitation [2i]*

Limitation [2i] recites “said upper, longitudinally outboard end of said first end slope sheet being reinforced by a first cross-wise extending beam.” Ex. 1001, 24:6–8. Petitioner argues that “[t]he 1946 Cyclopedia’s NSC ore car discloses this limitation.” Pet. 50. Specifically, Petitioner argues that the ore car has its end slope sheet reinforced by an end top chord, which “is a cross-wise beam with a V-shaped cross-section.” *Id.* In support of its position, Petitioner provides the following annotated images of the ore car’s structure.



In these graphics, Petitioner adds a magnified image of part of the ore car structure and labels certain structures as a “slope sheet,” a “first crosswise beam (top chord),” and a “rivet.” *Id.* at 51.

Petitioner further argues, in the alternative, that limitation [2i] would have been obvious over the 1946 Cyclopedia and Wong. Pet. 52–53. Petitioner asserts that the upper end of Wong’s end slope sheet 26 “is reinforced by a cross-wise, L-shaped beam positioned under the slope sheet.” *Id.* at 52. In support of this position, Petitioner provides the following annotated image of Wong’s Figure 4.



In this graphic, Petitioner adds a magnified image of part of the railcar structure and labels certain structures as an “end sheet,” an “end slope sheet,” and a “crosswise extending beam.” *Id.* According to Petitioner, an ordinarily skilled artisan would have been motivated to include such an L-shaped, cross-wise beam to reinforce the NSC ore car’s slope sheet at its upper end where a stress concentration results from connection to another structure. *Id.*

Patent Owner counters that limitation [2i] is neither disclosed by the 1946 Cyclopedia nor obvious over the 1946 Cyclopedia and Wong. Prelim. Resp. 27–30. Patent Owner argues that the 1946 Cyclopedia ore car’s end

top chord is not the same as the “first cross-wise extending beam” recited in limitation [2i]. *Id.* at 27–28. Addressing Petitioner’s argument that limitation [2i] would have been obvious over the 1946 Cyclopedia and Wong, Patent Owner contends that “the Petition fails to properly consider what Wong teaches.” *Id.* at 28. According to Patent Owner, “[t]he concern in Wong is not with lateral reinforcing beams,” “Wong relates to combining steel and aluminum to get needed strength while avoiding the corrosion issues that arise because steel and aluminum are galvanically coupled and will corrode if in contact with each other.” *Id.* at 29. Asserting that “Wong does not provide reinforcement,” Patent Owner contends that “[t]he Petition fails to articulate a reason why a [person of ordinary skill in the art] would have been motivated to combine the NSC Ore Cars and Wong or that the proposed combination would have been successful.” *Id.*

We first address Petitioner’s assertion that the 1946 Cyclopedia discloses limitation 2[i]. Pet. 50–51. Petitioner provides evidence that the 1946 Cyclopedia discloses an end slope sheet with its upper, longitudinally outboard end riveted to, supported by, and reinforced by an end top chord. *Id.* Petitioner also provides evidence that the 1946 Cyclopedia’s end top chord “is a crosswise beam.” *Id.* This evidence tends to show disclosure of “said upper, longitudinally outboard end of said first end slope sheet being reinforced by a first cross-wise extending beam,” as recited in limitation [2i].

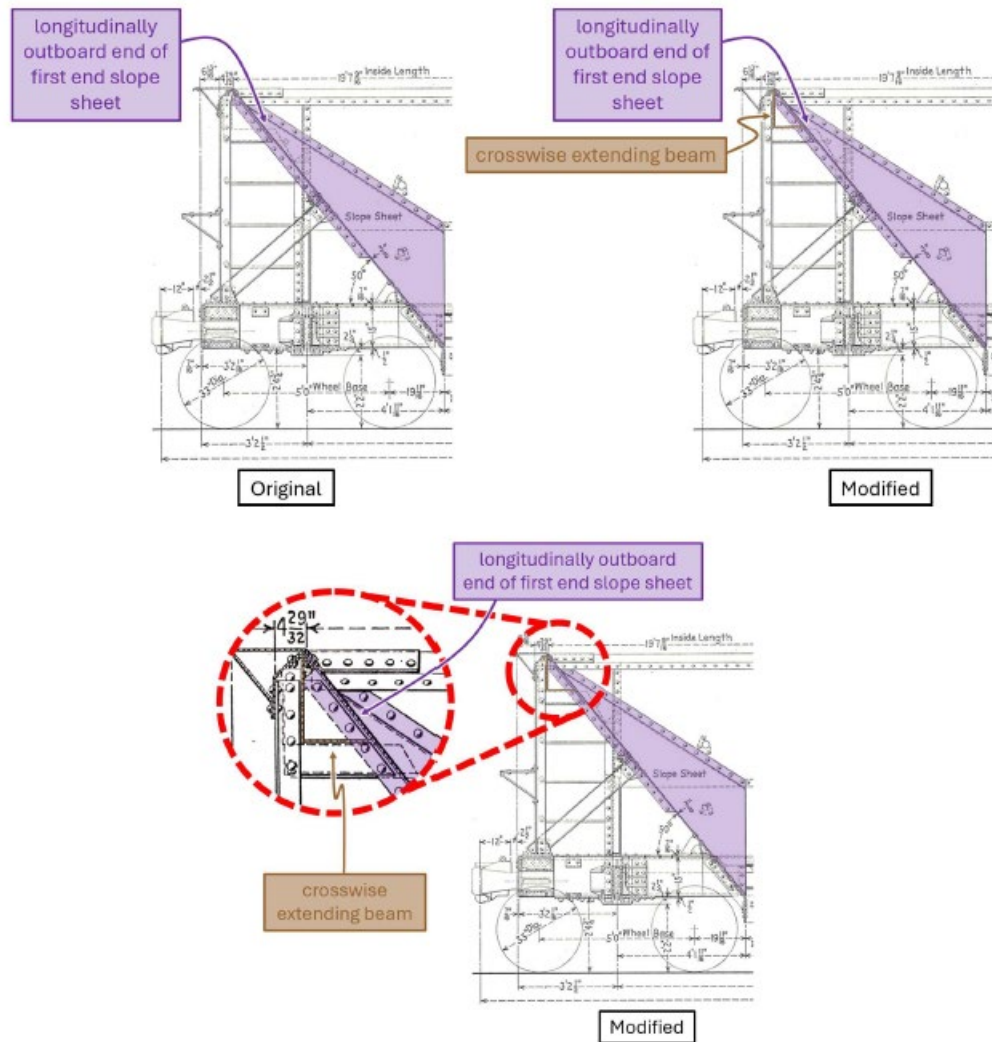
Patent Owner does not persuasively rebut this evidence. Patent Owner’s argument that Petitioner fails to explain “why the alleged ‘first crosswise beam’ it identifies in the NSC Ore Cars, without more, can also be the claimed ‘end top chord’” is not commensurate in scope with claim 2, which does not recite an “end top chord.” *See* Ex. 1001, 23:38–24:60; Prelim. Resp. 27. Moreover, Patent Owner does not provide a persuasive

reason for its suggestion that an end top chord cannot constitute the “first cross-wise extending beam” recited in claim 2. Prelim. Resp. 27–28. Patent Owner’s observation that the ’892 patent discloses using an “end top chord” and a “first crosswise beam” does not support Patent Owner’s suggestion that the two structures are mutually exclusive. *Id.* Nor does Patent Owner’s vague assertion that “[t]he ‘end top chord’ and the ‘first crosswise beam’ are different structures with different purposes.” *Id.* at 28. Patent Owner does not identify any specific difference in the purposes associated with the two terms. *Id.* Weighing the parties’ arguments and evidence, we find that Petitioner sufficiently shows that the 1946 Cyclopedia discloses limitation [2i]. Pet. 50–51; Prelim. Resp. 27–28.

We turn next to Petitioner’s assertion that limitation [2i] would have been obvious over the 1946 Cyclopedia and Wong. Weighing the parties’ arguments and evidence, we find Petitioner provides sufficient rational underpinning for its assertion that it would have been obvious in view of Wong to implement a cross-wise extending beam to reinforce the 1946 Cyclopedia’s NSC ore car’s end slope sheet. Pet. 52–53; Prelim. Resp. 28–30. In response to Petitioner’s assertion that “[t]he upper, outboard end of [Wong’s slope sheet 26] is reinforced by a cross-wise, L-shaped beam positioned under the slope sheet,” Patent Owner argues that “Wong does not provide reinforcement, but simply shows two sheets being connected for lading containment and load transfer.” Pet. 52; Prelim. Resp. 29. At this stage, we find Petitioner has the better position. Although we agree with Patent Owner that Wong shows two sheets connected to one another, that does not negate Petitioner’s correct observation that Wong shows an upper end of its end slope sheet 26 resting on an L-shaped structure, which apparently would reinforce end slope sheet. Pet. 52; Ex. 1003 ¶ 56.

Regarding whether an ordinarily skilled artisan would have had “any reason to look to Wong in the first place,” we again find that Petitioner has the better position at this stage. Prelim. Resp. 29. For example, Wong’s disclosure of “hopper railcar 10” (Ex. 1006, 3:6–9) and the 1946 Cyclopedia’s disclosure of “Freight Cars: Hopper Ore” (Ex. 1004, 27–28; Ex. 1054, 27–28) support Petitioner’s position that “Wong and the 1946 Cyclopedia are in the same field.” Pet. 52; *see also id.* at 76 (“Wong discloses a rail road hopper car (‘hopper railcar’ 10)”), 18–19 (“The ore-car section of the 1946 Cyclopedia—entitled ‘Freight Cars: Hopper Ore’—contains drawings and a photograph of an ore car manufactured by Patent Owner NSC.”); Ex. 1003 ¶ 56 (“Wong and the 1946 Cyclopedia are in the same field of hopper railcars”) (citing Ex. 1004, 27–28; Ex. 1006, code [57]). This position is not persuasively rebutted by Patent Owner’s argument that Wong’s hopper railcar 10 uses aluminum and steel together for certain reasons. Prelim. Resp. 28–29.

Additionally, we disagree with Patent Owner’s argument that the Petition does not address “how the cross-wise beam from Wong would be incorporated into the NSC Ore Cars.” Prelim. Resp. 29 (emphasis omitted). Both the Petition and Dr. Ahmadian show how the cross-wise beam would have been implemented in the following graphics:



Petitioner's and Dr. Ahmadian's graphics include three images of the end section of the 1946 Cyclopedia's NSC ore car: the original image, a modified image with a cross-wise beam added under the end slope sheet, and another modified image that further includes a magnification of the added cross-wise beam and the upper portion of the end slope sheet. Pet. 53; Ex. 1003 ¶ 56.

We also find unavailing Patent Owner's argument that "the proposed combination is unsatisfactory for its intended purpose," which Patent Owner explains as follows:

It is not clear how the addition of Wong's cross-wise beam in the NSC Ore Cars would transfer load directly down to the

undercarriage of the car. *Id.* The NSC Ore Cars already have structure for holding up the end slope sheet; and adding a redundant beam would require substantial time investments for the redesign and requisite analyses.

Prelim. Resp. 30. To the extent Patent Owner has identified some tradeoffs associated with the proposed modification, that does not support Patent Owner's contention that the combination would have been viewed as unsatisfactory. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”). Nor does it negate Petitioner's evidence that an ordinarily skilled artisan would have recognized benefit in reinforcing the end slope sheet, even if that would not have transferred load directly to the car's undercarriage. Pet. 52–53; Ex. 1003 ¶ 56. Based on all of the record arguments and evidence, we find Petitioner sufficiently shows that limitation [2i] would have been obvious over the 1946 Cyclopedia and Wong. Pet. 50–53; Prelim. Resp. 27–30.

b) Limitation [2l]

Limitation [2l] recites “a door actuator mounted above said sheer plate, said door actuator being at least partially overhung by said first end slope sheet; said door actuator being connected to said door by a mechanical transmission.” Ex. 1001, 24:14–16. Petitioner argues that it would have been obvious in view of the 1946 Cyclopedia and Lindström to configure the 1946 Cyclopedia's ore car with a door actuator above the sheer plate in a position at least partially overhung by the end slope sheet. Pet. 56–59. Petitioner asserts that “Lindström discloses a hopper car with a shear plate comprising plate 6 and an end slope sheet (‘sloping end floor’ 20),” as well as a door actuator “mounted above the shear plate and at least partially

overhung by the end slope sheet.” *Id.* at 56–57. According to Petitioner, “[i]t would have been obvious to modify the 1946 Cyclopedia’s NSC ore car to add a door-opening mechanism like Lindström’s, including the door actuator.” *Id.* at 58.

Petitioner reasons that an ordinarily skilled artisan would have recognized that the 1946 Cyclopedia’s NSC ore car needs a door opening mechanism to work properly and an ordinarily skilled artisan would have recognized Lindström’s as an obvious solution. Pet. 58–59. Noting that the 1946 Cyclopedia’s does not expressly disclose any particular door opening mechanism in its drawings, Petitioner advances that would have indicated to an ordinarily skilled artisan that “the particular mechanism is not critical and that any suitable mechanism would work.” *Id.* Given these considerations, Petitioner contends that an ordinarily skilled artisan “would have been motivated to make the modification because Lindström and the 1946 Cyclopedia are in the same field, and because the NSC ore car has a configuration similar to that of Lindström’s car.” *Id.* at 58. Petitioner further argues that “[t]hese same considerations would have given a [person of ordinary skill in the art] a reasonable expectation of success in incorporating a door-opening mechanism like Lindström’s in the NSC ore-car design.” *Id.* at 59.

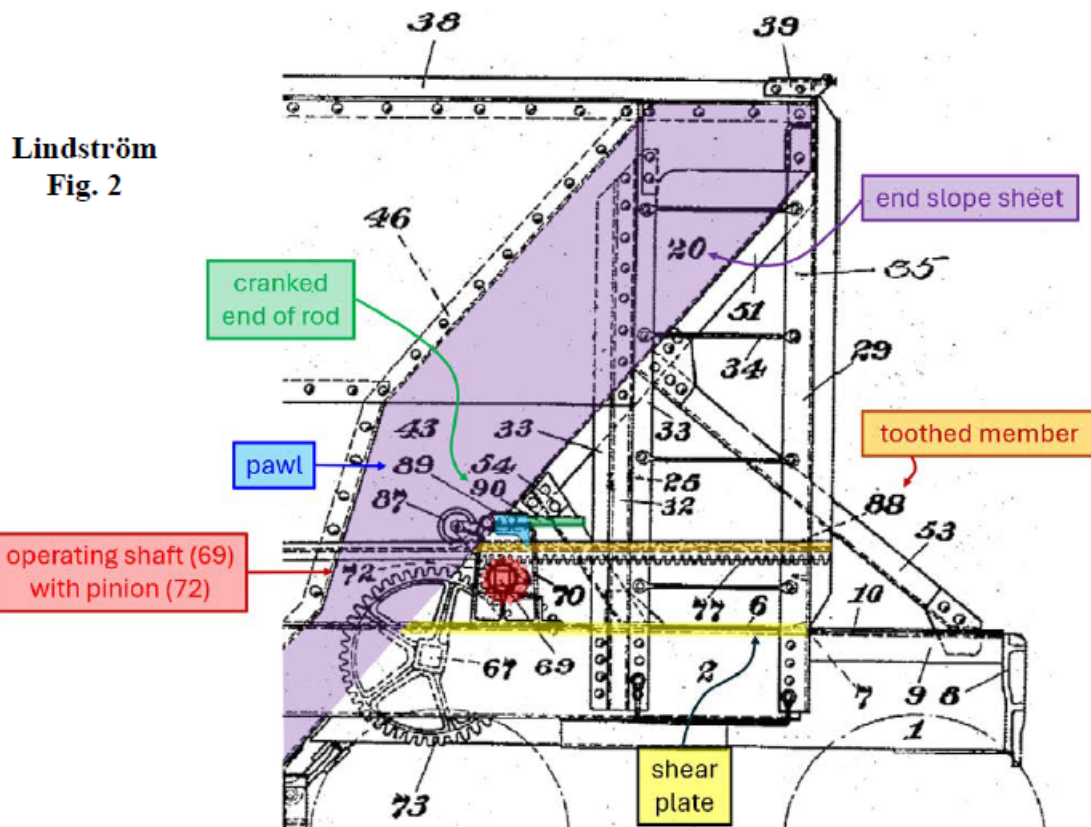
Patent Owner counters that “the Petition fails to meet its burden of showing the combinability of the NSC Ore Cars and Lindström teachings, or any likelihood of success of the proposed combination in an operational rail car.” Prelim. Resp. 33. According to Patent Owner, Petitioner fails to show any motivation to combine the references’ disclosures. *Id.* at 30–31. Patent Owner questions the feasibility of adding Lindström’s door actuator to the 1946 Cyclopedia’s NSC ore car. *Id.* at 31–32. Patent Owner also faults

Petitioner for not discussing “the door opening mechanism shown in [the] photograph” in the 1946 Cyclopedia of the NSC ore car. *Id.* at 32.

Weighing the parties’ arguments and evidence, we find that Petitioner sufficiently provides rational underpinning for its contention that it would have been obvious to use a door actuator like Lindström’s in the 1946 Cyclopedia’s NSC ore car. Pet. 56–59; Prelim. Resp. 30–33. Contrary to Patent Owner’s argument, we find that Petitioner’s evidence tends to show that an ordinarily skilled artisan would have had significant motivating reasons to modify the NSC ore car to include a door actuator like Lindström’s. Pet. 58–59.

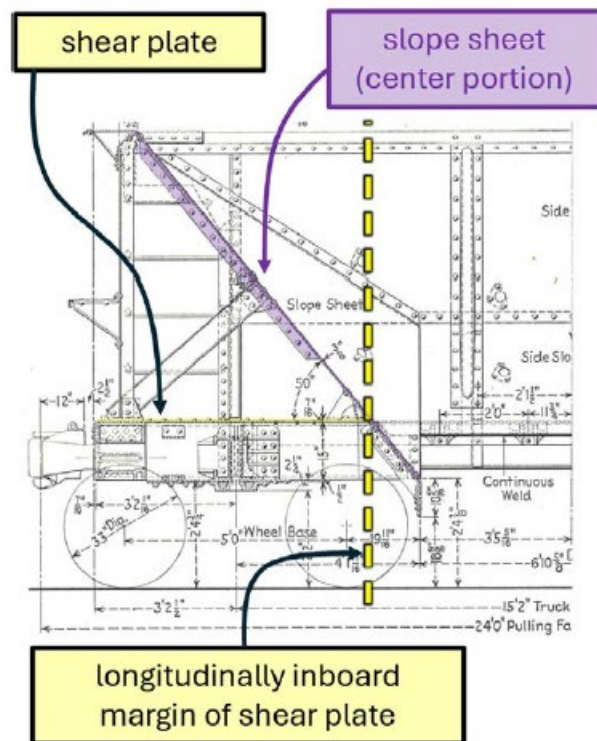
In combination with the undisputed recognition that the ore car would have needed a door operating mechanism, Dr. Ahmadian extensively identifies features relevant to implementing a door operating mechanism that are similar in both Lindström’s railcar and the NSC ore car. Ex. 1003 ¶ 60. For example, Dr. Ahmadian notes that the references “are in the same field of hopper railcars” and both disclose railcars with “hoppers, trucks, lower discharge, slope sheets, side sills, top chords, sidewalls, [and] sidewall stiffeners.” *Id.* Patent Owner does not dispute these similarities, but questions whether “door mechanisms are interchangeable” and whether “a [person of ordinary skill in the art] in 2009 would seek to modify a rail car from 1946 to include a door mechanism from 1915.” Prelim. Resp. 32. Given the undisputed similarity of the NSC ore car to Lindström’s railcar, we find Petitioner has shown sufficiently that an ordinarily skilled artisan would have recognized Lindström’s 1915 door actuator as an obvious option to fill the need for a door operating mechanism in the 1946 Cyclopedia’s ore car. Pet. 56–59; Ex. 1003 ¶¶ 59–60.

Petitioner's arguments and evidence also show sufficiently that an ordinarily skilled artisan would have had a reasonable expectation of success. Pet. 56–59; Ex. 1003 ¶¶ 59–60. Patent Owner and Dr. Viz question whether “Lindström’s door mechanism would fit into the design of the NSC Ore Cars,” but we find sufficient evidence that the 1946 Cyclopedia’s NSC ore car has space similar to Lindström’s for a door actuator. Prelim. Resp. 32; Ex. 2035 ¶ 62. Petitioner and Dr. Ahmadian provide evidence of Lindström’s door actuator occupying space between a shear plate and an end slope sheet, as shown in an annotated excerpt of Figure 2, reproduced below.



In this annotated excerpt from Lindström’s Figure 2, the annotations added by Petitioner and Dr. Ahmadian refer to certain door actuator components occupying a space between a “sheer plate” and an “end slope sheet.” Pet. 56; Ex. 1003 ¶ 59.

Petitioner and Dr. Ahmadian also provide evidence that the 1946 Cyclopedia's NSC ore car includes an equivalent space that could be occupied by a door actuator between a sheer plate and an end slope sheet. Pet. 49; Ex. 1003 ¶ 55. Petitioner and Dr. Ahmadian do so, for example, in the annotated excerpt of the 1946 Cyclopedia reproduced below.



In this annotated graphic, Petitioner and Dr. Ahmadian label portions of the NSC ore car as a “sheer plate” and an “end slope sheet,” which bound a space that appears equivalent to the space occupied by Lindström’s door actuator. Pet. 49; Ex. 1003 ¶ 55.

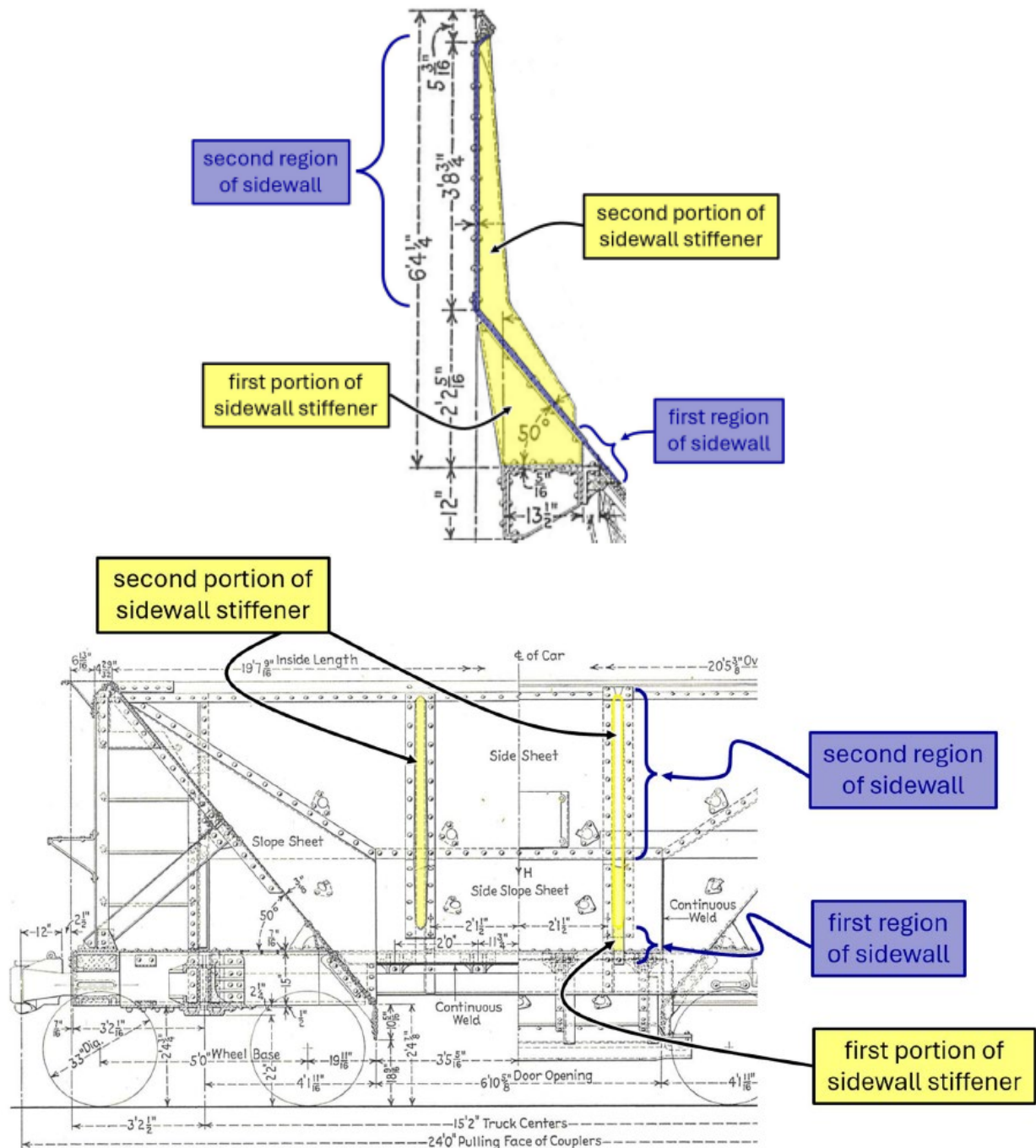
Petitioner’s evidence of a reasonable expectation of success is not persuasively rebutted by Patent Owner’s and Dr. Viz’s conclusory contention that “[a] more detailed engineering study and analysis would need to be performed that would require more quantitative technical information than what these simple renderings in Lindström show.” Prelim. Resp. 32; Ex. 2035. Obviousness does not require absolute predictability of

success. *In re O'Farrell*, 853 F.2d 894, 903–04 (Fed. Cir. 1988). Also, “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007).

Additionally, we do not find Petitioner’s position persuasively rebutted by Patent Owner’s argument that Petitioner allegedly does not address a door actuator shown in the 1946 Cyclopedia’s photograph of the NSC ore car. Prelim. Resp. 32 (citing Ex. 1004, 28; Ex. 1054, 28). To the extent a door actuator appears in that photograph, Patent Owner does not identify a persuasive reason that would undermine Petitioner’s position. *See id.*

c) Limitation [2u]

Limitation [2u] recites “said sidewall stiffener having web continuity between said first and second portions thereof.” Ex. 1001, 24:59–60. Petitioner argues that “[a]s discussed in connection with limitation [1j], the 1946 Cyclopedia’s NSC ore car discloses this limitation.” Pet. 64. Petitioner explains that the NSC ore car has “two portions of [its] side-wall stiffener positioned on either side of the side wall and arranged in the same vertical plan, as in the ’892 patent.” *Id.* at 32. Petitioner argues that the ’892 patent “refers to . . . alignment in a vertical plane as ‘web continuity.’” *Id.* at 10. In support of its position, Petitioner provides the following annotated images of the ore car’s structures.



In these images, Petitioner includes annotations identifying first and second sidewall portions, as well as first and second portions of sidewall stiffeners. *Id.* at 32.

Patent Owner counters that “[t]he Petition fails to establish that the claimed ‘sidewall stiffener having web continuity between said first and

second regions thereof is taught by the NSC Ore Cars.” Prelim. Resp. 23. Patent Owner concedes that the NSC ore cars have sidewall stiffeners, but argues that the stiffeners lack “webs.” *Id.* at 23–24. Patent Owner cites the ’892 patent’s disclosure of a sidewall stiffener configuration in which “the vertical stiffener, 102, acts as the web of a T-section, and the local region of the wall section to which it is joined functions as the flange of that T-section.” Ex. 1001, 15:54–57; Prelim. Resp. 24. Explaining that “[t]he drawings for the NSC Ore Cars appear to have sections that are fastened to the side wall,” Patent Owner contends that “[a person of ordinary skill in the art] would not conclude that what is shown in the drawings relied on by Petition is the same thing as what is claimed in the ’892 Patent.” Prelim. Resp. 24. Patent Owner adds that “the web continuity of the I-beam formation feature of the ’892 Patent differentiates the claims over that asserted art which utilized L-brackets for securing the lower portion of the stiffener to the side wall and includes a single L-bracket on the interior with no discernible sidewall stiffener.” *Id.*

Petitioner shows sufficiently that the 1946 Cyclopedia teaches sidewall stiffeners with “web continuity,” consistent with the ’892 patent’s disclosure. Pet. 9–14, 32–33, 64. Record evidence supports Petitioner’s position that the ’892 patent indicates that alignment of two portions of a sidewall stiffener in a vertical plane constitutes “web continuity.” *Id.* at 10 (citing Ex. 1001, 15:44–46 (“Portions 104 and 106 are co-planar, or substantially co-planar, such that stiffener member 102 has web continuity through member 94.”), 15:64–65). And Patent Owner does not dispute Petitioner’s contention that the NSC ore car’s sidewall stiffeners have two portions vertically aligned with one another, as described in the ’892 patent. Pet. 32; Prelim. Resp. 23–26.

Patent Owner's arguments are not commensurate in scope with the claim language. Prelim. Resp. 23–26. Intrinsic evidence undermines Patent Owner's suggestion that the claim language "sidewall stiffener having web continuity" requires any particular shape, much less an "I-beam formation feature." *E.g., id.* at 24. For example, claim 15 depends from claim 2 and requires that "said first and second portions of said sidewall stiffener are made of flat bar . . . positioned in vertical-transverse planes." Ex. 1001, 26:29–31. This limits claim 15 to a shape other than an "I-beam formation feature." Under the doctrine of claim differentiation, claim 15 also indicates that claim 2's "sidewall stiffener having web continuity" encompasses shapes other than flat bar. *See SanDisk Corp. v. Kingston Tech. Co.*, 695 F.3d 1348, 1361 (Fed. Cir. 2012). Given this, without claim 2 specifying any shape for the sidewall stiffener, we find unavailing Patent Owner's arguments about the prior art stiffeners lacking an "I-beam" or "T-section" shape. Regarding the '892 patent Specification's discussion of a "T-section" configuration, Patent Owner's arguments and evidence do not provide a persuasive basis for importing this example into claim 2 as a limitation. *See SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) ("Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not part of the claim.").

d) Whether the 1946 Cyclopedia's Figures Show the Same Railcar Configuration

Patent Owner also contends that Petitioner does not support its view that certain images from the 1946 Cyclopedia show the same railcar configuration. Prelim. Resp. 18. Patent Owner argues as follows:

The first is a schematic drawing of a rail car captioned as being for use by Canadian Pacific, a large rail operator. *See* 1946 Cyclopedia at 27. The second is a picture of a rail car captioned and shown as being used by CN, i.e. Canadian National, a competitor of Canadian Pacific. *See* 1946 Cyclopedia at 28. The Petition and accompanying expert report of Dr. Ahmadian fail to establish that the schematic is the same rail car design as the picture, or vice-versa; or if they are not, that a POSITA would have been motivated to combine these two separate disclosures to arrive at any challenged claim.

Id. (citing Pet. 20–22, 24, 26, 28, 30, 36, 61, 74). According to Patent Owner “[t]his *ipse dixit* conflation of a schematic and picture relating to different NSC Ore Cars, without establishing the identity of those designs, undermines any assertion by Petitioner that there is a reasonable likelihood that any claim is invalid as obvious.” *Id.*

Petitioner counters that a number of aspects of the 1946 Cyclopedia indicate that the schematic and the photograph show the same configuration. Prelim. Reply 3–4. For example, Petitioner notes that the two images cross-reference one another: “Figure 2,670 on page 294 contains the schematics and references the photograph on page 295 with the caption ‘*See also Fig. 2,673.*’ [Ex. 1004,] 27. Figure 2,673 in turn references the schematics of Figure 2,670 with the caption ‘*See also page 294.*’ *Id.* at 28.” *Id.* at 3.

Petitioner also asserts that the railcar numbers in the photographs confirm that Figures 2,670 and 2,673 show the same configuration. Prelim. Reply 4. Noting that “Figure 2,670 indicates that the schematics shown in the figure were used to manufacture ‘Series 114,100-114,349’—250 railcars for Canadian National (CN) with those serial numbers,” Petitioner argues that “[t]he railcar in the photograph in Figure 2,673 is one of those 250

railcars.” *Id.* Petitioner illustrates this with the following annotated version of Figure 2,673.



Fig. 2.673—Canadian National 50-ton center discharge ore car for use at Steep Rock mining operations. Built by National Steel Car Corporation, Ltd.
Light weight, 40,600 lb.; load limit, 128,400 lb.; capacity, 825 cu. ft.; length inside, 19 ft. 8 in.
* (See also page 294)

In its annotated version of Figure 2,673, Petitioner has encircled the number “114191” on the side of the railcar. *Id.*

Patent Owner responds that “Petitioner’s reliance on ‘*see also*’ notations is insufficient” to show “that the schematic and photograph depicting rail cars for ‘Canadian National’ and ‘Canadian Pacific,’ respectively, represent the same design or embodiment.” Prelim. Sur-reply 3.

Weighing the parties’ arguments and evidence, we find Petitioner’s position more persuasive. Petitioner’s undisputed observations that the figures cross-reference one another and that the railcar number in the photograph is among those listed for the schematic show sufficiently that the two figures show the same configuration, notwithstanding Patent Owner’s observation about references to different Canadian entities.

e) Whether Petitioner's Declarant Considered the Claimed Invention as a Whole

Patent Owner also contends that Petitioner's declarant did not consider whether the claimed invention as a whole would have been obvious and ignored certain claim limitations. Prelim. Resp. 19–20; Prelim. Sur-reply 4. Patent Owner, thus, argues that his testimony should not be given any weight. Prelim. Resp. 20; Prelim. Sur-reply 4. Petitioner, however, provides citations to his testimony that demonstrate all claim limitations were considered and the claims as a whole were also considered. Prelim. Reply 2–3 (citing Ex. 1003 ¶¶ 17, 24, 49–50, 54–59). The parties may further develop this issue during trial.

E. OTHER GROUNDS

Petitioner's Grounds 1a and 2a challenged only claim 1 of the '892 patent. Accordingly, because Patent Owner statutorily disclaimed claim 1 of the '892 patent, Grounds 1a and 2a are moot, and we do not institute those grounds.

Having found Petitioner shows a reasonable likelihood of prevailing at least on Ground 1b's challenge of independent claim 2, we institute *inter partes* review for Grounds 1b, 1c, 1d, 2b, and 2c on all claims challenged in those grounds. See *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1354, 1359–60; *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018); 37 C.F.R. § 42.108(a) (“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

III. ORDER

It is:

ORDERED that *inter partes* review of claims 2–15 of the '892 patent is instituted on all grounds challenging those claims, including Grounds 1b, 1c, 1d, 2b, and 2c; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

IPR2025-01046
Patent 8,166,892 B2

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