UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK
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UNI-SYSTEMS, LLC,

Plaintiff,

v.

UNITED STATES TENNIS ASSOCIATION NATIONAL TENNIS CENTER INCORPORATED, HUNT CONSTRUCTION GROUP, INC., HARDESTY & HANOVER, LLC, HARDESTY & HANOVER, LLP, and GEIGER GOSSEN CAMPBELL ENGINEERS, P.C., DBA GEIGER ENGINEERS,[1]

Defendants.
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MEMORANDUM & ORDER

17-CV-147(KAM)(CLP)

KIYO A. MATSUMOTO, United States District Judge:

Plaintiff Uni-Systems, LLC ("Plaintiff" or "Uni-Systems") commenced the instant action against United States Tennis Association National Tennis Center, Hunt Construction Group, Inc., Hardesty & Hanover, LLC, Hardesty & Hanover, LLP, and Geiger Campbell Engineers, P.C. (collectively, "Defendants"), alleging, *inter alia*, that Defendants infringed upon United States Patent No. 6,789,360 (the "'9360 Patent") and United States Patent No. 7,594,360 (the "'4360 Patent"), both of which are owned by Uni-Systems and relate to retractable roof design.

[1] Uni-Systems also named the following as defendants: Rossetti Inc.; Matthew L. Rossetti Architect, P.C.; Morgan Engineering Systems, Inc.; Morgan Kinetic Structures, Inc.; and Morgan Automation, Inc. On April 7, 2020, the court transferred Uni-Systems' claims against these parties. (*See* ECF No. 419.)

Before the court are the parties' submissions for claim construction of five terms in the '9360 Patent: (i) "tied arch," (ii) "to assume most gravity induced stress," (iii) "retention mechanism," (iv) "retention element," (v) "preventing said roof member from being lifted upwardly"; and six terms in the '4360 Patent: (i) "a lateral release system for each of said transport mechanism," (ii) "interposed between," (iii) "stable movement," (iv) "limited amount of movement," (v) "very small side load," and (vi) "no need for additional lateral reinforcement." The court construes these terms pursuant to the discussion set forth below.

Background

As indicated in the court's prior orders in this litigation, Uni-Systems describes itself as the "leading designer of retractable roof systems in the United States." (ECF No. 325, Second Amended Complaint, ¶ 18). Uni-Systems has developed valuable intellectual property in connection with its retractable roof designs, including the two patents at issue here: the '9360 Patent and the '4360 Patent.

Uni-Systems commenced the instant patent infringement action on January 11, 2017, alleging that Defendants infringed on the '9360 Patent and '4360 Patent in connection with their design, manufacture, and construction of retractable roofs over the Arthur Ashe Stadium and the Louis Armstrong Stadium at the

National Tennis Center in Queens, New York. The parties submitted a "Joint Claim Terms Chart" on August 10, 2018, setting forth the parties' respective constructions of the disputed claim terms. (*See* ECF No. 253-1, Joint Claim Terms Chart ("JCTC").)[2] The court held a claim construction, or *Markman*, hearing on December 13-14, 2018, at which the parties presented tutorials and expert testimony from R. Shankar Nair, Ph.D. ("Dr. Nair") (Uni-Systems' expert) and Timothy J. Lack, PE ("Mr. Lack") (Defendants' expert) as to the construction of the disputed terms. (Transcript of *Markman* Hearing ("Hr'g Tr.").)

The parties filed pre-*Markman* briefs (*see* ECF No. 259, Uni-Systems' Opening Claim Construction Brief ("Pl. Mem."); ECF No. 269, Defendants' joint Claim Construction Brief ("Def. Mem."); ECF No. 274, Uni-Systems' Reply Claim Construction Brief ("Pl. Rep.")), post-*Markman* briefs (*see* ECF No. 329, Defendants' Joint Supplemental Claim Construction Brief ("Def. Supp. Mem."); ECF No. 330, Uni-Systems' Post-Hearing Claim Construction Brief ("Pl. Supp. Mem.")), and notices of supplemental authority and evidence (ECF No. 341, Uni-Systems' Notice of Supplemental Authority; ECF No. 343, Defendants' Response to Notice of Supplemental Authority; ECF No. 354, Uni-Systems' Notice of Supplemental Evidence; ECF No. 356, Defendants' Joint Response

[2] The parties agreed to the construction of certain terms, removing them from contention. (ECF No. 312-1, Joint Claim Construction Glossary.)

to Notice of Supplemental Evidence; ECF No. 357, Hunt's Response; ECF No. 358, Geiger's Response).

Discussion

A patent must describe the exact scope of an invention to effectively protect an inventor's rights. *See Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 373 (1996). Through a patent's claims, a patentee defines the precise scope of the invention and, thus, the scope of the patentee's right to exclude others from making, using, or selling the patented invention. *Id.* Any patent infringement action, therefore, must begin with a proper construction of a patent's claim limitations. *See Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004).

I. Legal Standards for Claim Construction

A. General Principles

"'[T]he construction of a patent, including terms of art within its claim,' is not for a jury but 'exclusively' for 'the court' to determine." *Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 321 (2015) (quoting *Markman*, 517 U.S. at 372).[3] The claim construction analysis, an issue of

[3] In *Teva*, the Supreme Court held that the Federal Circuit must apply a clear error standard when reviewing a district court's resolution of subsidiary factual matters made in the course of its construction of a patent claim. When a "district court reviews only evidence intrinsic to the patent (the patent claims and specifications, along with the patent's prosecution history), the judge's determination will amount solely to a determination of law, and the Court of Appeals will review that construction *de novo*." *Teva*,

substantive patent law, is governed by Federal Circuit law. *See Spiel Assoc., Inc. v. Gateway Bookbinding Sys., Ltd.*, No. 03-CV-4696, 2007 WL 6148516, at *3 (E.D.N.Y. June 21, 2007). The claim construction determination governs the question of infringement, and also serves an important "public notice function" by providing notice to the public of what inventions are (or are not) covered by a given patent. *Markman*, 517 U.S. at 373; *see also Pitney Bowes, Inc. v. Hewlett–Packard Co.*, 182 F.3d 1298, 1311 (Fed. Cir. 1999) (referring to "public notice function" of patent claims).

"The words of a claim are generally given their ordinary and customary meaning as understood by a person of ordinary skill in the art" ("POSITA") "when read in the context of the specification and prosecution history." *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005)). "There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Id.* Although redefinition or disavowal need not

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574 U.S. at 331. "In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Id.*

be express to be clear, *Trustees of Columbia Univ. in City of New York v. Symantec Corp.*, 811 F.3d 1359, 1364 (Fed. Cir. 2016), they must both meet an "exacting" standard, *Thorner*, 669 F.3d at 1365.

"To act as its own lexicographer, a patentee must 'clearly set forth a definition of the disputed claim term' other than its plain and ordinary meaning." *Id.* (quoting *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). "It is not enough for a patentee to simply disclose a single embodiment or use a word in the same manner in all embodiments, the patentee must 'clearly express an intent' to redefine the term." *Id.* (quoting *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1381 (Fed. Cir. 2008)).

Disavowal "requires that the specification or prosecution history make clear that the invention does not include a particular feature or is clearly limited to a particular form of the invention." *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014). Mere criticism of a particular embodiment encompassed in the plain meaning of a claim term is not enough to rise to the level of clear disavowal. *Epistar Corp. v. Int'l Trade Comm'n*, 566 F.3d 1321, 1335 (Fed. Cir. 2009). "[E]ven where a particular structure makes it particularly difficult to obtain certain benefits of the claimed invention, this does not rise to the

level of disavowal of the structure." *Thorner*, 669 F.3d at 1366 (quotation omitted). Even if the only embodiment contains, or all of the embodiments contain, a particular limitation, that "is likewise not enough" for a court to read the limitation into the claim. *Id.*

Courts must read claims in view of the specification, but may not simply import limitations from the specification into the claims. *Prima Tek II, L.L.C v. Polypap, S.A.R.L.*, 318 F.3d 1143, 1148 (Fed. Cir. 2003). Similarly, although a patent's specification describes specific embodiments of the patent, including preferred embodiments, the court should take care not to automatically construe the claim as limited to the disclosed embodiments. *Phillips*, 415 F.3d at 1312-13. On the other hand, "a claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct." *Accent Packaging, Inc. v. Leggett & Platt, Inc.*, 707 F.3d 1318, 1326 (Fed. Cir. 2013) (quoting *On–Line Techs., Inc. v. Bodenseewerk Perkin–Elmer GmbH*, 386 F.3d 1133, 1138 (Fed.Cir.2004)).

A court addressing a claim construction dispute need not always offer a construction on a disputed claim term beyond "plain and ordinary meaning." *Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1319 (Fed. Cir. 2016). Courts often resolve claim construction disputes by rejecting a narrow

construction and holding that the disputed term should retain its plain and ordinary meaning. *See, e.g.*, *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1326 (Fed. Cir. 2012); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) (resolving dispute by rejecting defendants' construction and adopting "plain and ordinary meaning"). But "[a] determination that a claim term 'needs no construction' or has the 'plain and ordinary meaning' may be inadequate when a term has more than one 'ordinary' meaning or when reliance on a term's 'ordinary' meaning does not resolve the parties' dispute." *Eon Corp.*, 815 F.3d at 1318 (quoting *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008)).

B. Evidentiary Sources in Claim Construction

District courts have "wide latitude" in determining the procedure by which to reach a final determination regarding construction of a claim. *Ballard Med. Prods. v. Allegiance Healthcare Corp.*, 268 F.3d 1352, 1358 (Fed. Cir. 2001). "As long as the trial court construes the claims to the extent necessary to determine whether the accused device infringes, the court may approach the task in any way that it deems best." *Id.* The court need only construe claims that are "in controversy, and only to the extent necessary to resolve the controversy." *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803

(Fed. Cir. 1999). The focus is on resolution of disputed meanings and scope for use in determination of infringement. *O2 Micro*, 521 F.3d at 1362.

Though courts have discretion over claim construction procedure, the law surrounding claim construction is well-established. Courts must construe patent claims "objectively," *Vivid Techs.*, 200 F.3d at 803, by seeking to accord a claim the meaning it would have to a "person of ordinary skill in the art at the time of the invention," *Innova/Pure Water, Inc.*, 381 F.3d at 1116. In doing so, a court must consider three primary sources within the intrinsic evidence of record: (1) the language of the claims, (2) the specification, and (3) the prosecution history. *Secure Web Conference Corp. v. Microsoft Corp.*, No. 13-CV-2642, 2014 WL 4954644, at *1 (E.D.N.Y. Oct. 2, 2014) (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

1. Claim Language

First, the court looks to the "words of the claims themselves, both asserted and nonasserted, to define the scope of the patented invention." *HowLink Global LLC v. Network Commc'ns Int'l. Corp.*, 561 F. App'x 898, 905 (Fed. Cir. 2014) (quoting *Vitronics*, 90 F.3d at 1582). The words of the claim are the "controlling focus" of the analysis. *Secure Web*, 2014 WL 4954644, at * 2 (citing *Digital Biometrics, Inc. v. Identix,*

Inc., 149 F.3d 1335, 1344 (Fed. Cir. 1998)). The language of a claim is generally given its ordinary and customary meaning, unless, as explained above, a distinct definition is employed in the specification or prosecution history. *See Digital Biometrics*, 149 F.3d at 1344 (citing *York Prods., Inc. v. Cent. Tractor Farm & Family Ctr.*, 99 F.3d 1568, 1572 (Fed. Cir. 1996)). The ordinary and customary meaning of a term is that which one of "ordinary skill in the art at the time of the invention" (a "POSITA") would understand. *Innova/Pure Water*, 381 F.3d at 1116.

2. Specification

Second, the court looks to a patent's specification, as "[c]laims must be read in view of the specification, of which they are a part." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370. Though terms are generally given their plain and ordinary meaning to a POSITA, an exception exists where "a patentee sets out a definition and acts as her own lexicographer." *Stryker Corp. v. Zimmer, Inc.*, 837 F.3d 1268, 1272 (Fed. Cir. 2016). The patentee's intent to act as his or her own lexicographer must be clear. *Vitronics*, 90 F.3d at 1582. If a patentee selects a meaning distinct from that which the claim terms would otherwise have to a POSITA, the different meaning must be set out in the specification in a manner sufficient to give a POSITA notice of

the change from the usual meaning. *Innova/Pure Water*, 381 F.3d at 1117. "Because the inquiry into the meaning of claim terms is an objective one, a patentee who notifies the public that claim terms are to be limited beyond their ordinary meaning . . . will be bound by that notification, even where it may have been unintended." *Id.*

In reviewing the specification, courts must be careful not read limitations from the specification into a claim. *Howmedica Osteonics Corp. v. Zimmer, Inc.*, 822 F.3d 1312, 1321 (Fed. Cir. 2016) (citing *Phillips*, 415 F.3d at 1323); *see also Callicrate v. Wadsworth Mfg., Inc.*, 427 F.3d 1361, 1368 (Fed. Cir. 2005). Furthermore, "the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Phillips*, 415 F.3d at 1315.

3. Prosecution History

Third, the court may consider the prosecution history of the patent, if it is in evidence. *Id*. A patent's prosecution history contains a complete record of all proceedings before the United States Patent and Trademark Office ("USPTO"), including any express representations made by the applicant regarding the scope of the patent's claims. *See id*. A patent's prosecution history, like the specification, provides evidence of how the USPTO and the inventor understood the

patent. *Id.* The prosecution history "limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution." *Southwall Tech., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576 (Fed. Cir. 1995). This is because "[c]laims may not be construed one way in order to obtain their allowance and in a different way against accused infringers." *Id.*

4. Extrinsic Evidence

Finally, though courts look primarily to intrinsic evidence in resolving a claim construction dispute, a court may consider extrinsic evidence when ambiguity remains after consulting the intrinsic evidence. *Vitronics*, 90 F.3d at 1583. Extrinsic evidence may assist the court in understanding the underlying technology, the meaning of terms to a POSITA, and how the invention works. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is less significant than the intrinsic record in determining the legally operative meaning of claim language, and courts should not place too much reliance on extrinsic evidence. *Id.* Relevant extrinsic evidence includes expert testimony, inventor testimony, dictionaries, and relevant treatises or articles. *Id.*

II. Construction of Disputed Claim Terms

Bearing in mind these principles of claim construction, the court addresses each disputed term in the

'9630 and '4360 Patents in turn, and construes the claims as described below.

A. Terms in the '9360 Patent

The '9360 Patent "discloses a retractable roof system for a stadium." (Pl. Mem. at 3.) The '9360 Patent, which derives its priority from U.S. Provisional Application No. 60/263,645 (the "'645 Provisional"), was filed on January 22, 2002, and issued on September 14, 2004 with 23 claims. (ECF No. 260, Decl. in Supp. of Uni-Systems' Opening Claim Construction Brief, Ex. F, '9360 Patent, at 1.)[4]

Uni-Systems developed the '9360 Patent to address the need for an improved stadium roof design that was lighter in weight, less bulky, and less likely to interfere with the view of spectators within the stadium than conventional stadium roof designs. (*Id.* at Abstract.) In Uni-Systems' patented design, roof panels are mounted for movement along guide tracks, and at least one major truss spans the distance between roof support locations. (*Id.* at 02:14-19, 02:35-38.)[5] The major truss is configured as a tied arch. (*Id.* at 02:14-19.) A curved, convex guide track is mounted to the curved, convex upper portion of

[4] In future references, the court cites to Plaintiff's exhibits only by the corresponding letter reference (e.g., Ex. A) and to Defendants' exhibits only by the corresponding numerical reference (e.g., Ex. 1).

[5] Citations to the '9360 Patent and '4360 Patent utilize the internal pagination of the patent documents.

the tied arches. (*Id.* at 02:51-55.) The movable roof panels are supported by carrier assemblies, which traverse the guide tracks. (*Id.* at 5:23-33.) The retractable roof system, as included in a stadium, is illustrated at a high level in Figure 1 of the '9360 Patent:

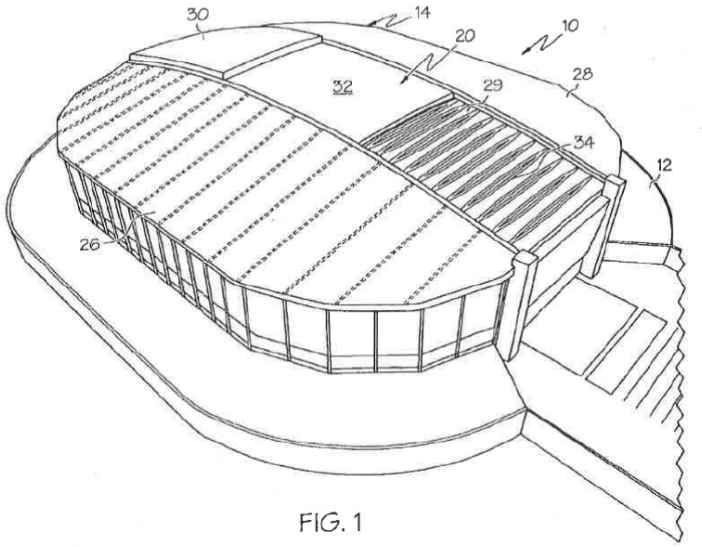


FIG. 1

(*Id.* at Fig. 1.)

The parties dispute the proper construction of five terms in the '9360 Patent: (i) "tied arch"; (ii) "to assume most gravity induced stress"; (iii) "retention mechanism"; (iv) "retention element"; and (v) "preventing said roof member from being lifted upwardly." All disputed terms in the '9360 Patent appear in Claim 1. (*Id.* at 10:06-26.) The court will address the proper construction of each disputed term in turn.

1. "Tied Arch" and "To Assume Most Gravity Induced Stress" (Claim 1)

The terms "tied arch" and "to assume most gravity

induced stress" appear in Claim 1 as follows:

> [A]t least one major truss spanning a distance between a first support location and a second support location that is at least 200 feet, said major truss being structurally configured as a **tied arch** having a curved convex upper portion and a tensioned lower portion that extends directly beneath said curved convex upper portion and is shaped, sized and positioned **to assume most gravity induced stress** within the major truss as tension.

('9360 Patent at 10:07–12 (emphasis added).) As background, Plaintiff's expert, Dr. Nair provided some helpful context regarding arches. (Hr'g Tr. at 20:11-21:11.) A "classic" arch is fixed to an abutment, and when a load is placed on the arch, the whole arch goes into compression and squeezes to prevent it from spreading out by its connections into the ground. (*Id.* at 20:11-20:19.) Where the arch is elevated, the outward thrust cannot be pushed into the ground, and to address this issue, a connector is placed between the two ends of the upper arch. (*Id.* at 21:01-22:03.) In this structure, which Dr. Nair refers to as a "tied arch," the upper member is usually called the "rib" and the lower member is called the "tie." (*Id.* at 22:14-16.) When a uniform load is placed on this structure, the rib is in compression and the tie, preventing the rib from spreading by holding its ends, is in tension. (*Id.* at 23:14-16.) The compression in the rib equals the tension in the tie. (*Id.* at 23:16-19.) When a non-uniform load is placed on the structure, however, like a retractable roof, the loaded part falls and the

unloaded part rises, "like a teeter totter." (*Id.* at 24:12-14.) In this situation, some bending and flexion may occur, and elements, e.g., vertical or diagonal, are added between the two members to stabilize the structure. (*Id.* at 24:09-19.)

Plaintiff argues the court should construe "tied arch" consistent with its plain and ordinary meaning as set forth in Claim 1, specifically, as "an arch in which the ends are connected with a connecting member." (Pl. Mem. at 11-12.) Defendants argue the court should construe "tied arch" as "an arch having a curved convex upper portion and a tensioned lower portion connected by vertical members with few if any diagonal members between the portions." (Def. Mem. at 4.) Although the parties each cited examples of tied arches utilizing only vertical elements, the experts agreed that a POSITA would define tied arch as an arch that has a tie between its support points, matching Plaintiff's construction. (Ex. A, Nair Decl., ¶ 32; Lack Dep. Tr. at 59:09-17 ("Q. How would you define what a tied arch is, if you were providing a definition of 'tied arch,' generally? A. I mean, it's simple. It would be an arch that has a tie between its support points instead of a non-tied between the support points. Q. Is that it? A. Yeah."); *see* Hr'g Tr. at 210:02-14 (Lack).) The primary dispute is, thus, whether a limitation eliminating most or all diagonal members from between the portions of the tied arch must be added to the

otherwise plain and ordinary meaning of "tied arch," based on the intrinsic evidence. The court agrees with Plaintiff's proposed construction and finds that no limitation regarding the inclusion or absence of diagonal elements is warranted.

As Plaintiff contends, a tied arch structure is well known to a POSITA. (*See* Pl. Mem. at 5.) A POSITA would generally understand a tied arch as referring to a structural system having a curved member where the ends are interconnected with a tension member, i.e., are "tied together" by the lower member. Both experts agree this is the case. (*See* Hr'g Tr. at 103:12-19 (Nair); Ex. BB, Nair Supp. Decl., ¶ 6; Hr'g Tr. 210:02-14 (Lack).) This plain meaning does not expressly require or exclude the presence of diagonal members. (Nair Decl. ¶ 32 ("The presence or absence of diagonal members is irrelevant to the classification of an arch as a tied arch.").) Dr. Nair provides an example of an article describing a tied arch with diagonal members. (Ex. E, W. De Corte et al., *Use of Continuous High-Frequency Strain Gauge Measurements for the Assessment of the Role of Ballast in Stress Reduction on Steel Railway Bridge Decks*, at 352, Insight Vol. 48 No. 6 (June 2006).)

This plain meaning would generally govern, unless a distinct definition is employed in the specification or prosecution history. *See, e.g.*, *Thorner*, 669 F.3d at 1365.

Despite Defendants' arguments to the contrary, the court finds that nothing in the '9360 Patent suggests a narrower scope.

Looking to the claim language, nothing in the '9360 Patent, including the specification, expressly defines the term "tied arch" to exclude instances where there are diagonal members. The '9360 Patent describes a "tied arch having a curved convex upper portion and a tensioned lower portion . . . ." ('9360 Patent at 10:10-12.) The specification matches this definition, describing a tied arch, identically, as "having a curved convex upper portion and a lower portion . . . ." (*Id.* at 04:40-41.) In fact, other limitations noted in dependent claims supports rejecting Defendants' narrow construction of "tied arch."

The '9360 Patent contains a dependent claim, Claim 5, which claims "[a] roof assembly according to claim 1, wherein said major truss *does not make substantial utilization of diagonal structural elements therein* to assume horizontal stress within said major truss." (*Id.* at 10:35-39.) "[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Phillips*, 415 F.3d at 1315; *see also Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380 (Fed. Cir. 2006) (reading an additional limitation from a dependent claim into an independent claim

makes the additional limitation superfluous). Claim 5 depends on Claim 1, but adds an additional element, i.e., elimination of substantial use of diagonal elements. This is the only difference between Claim 1 and Claim 5, rendering this distinction particularly notable. Had the patentees intended to define "tied arch" to exclude substantially all diagonal elements, they would not have needed to include Claim 5 or could have, as they did in Claim 5, drafted Claim 1 such that it defined "tied arch" to exclude diagonal elements. Reading the limitation from dependent Claim 5 into independent Claim 1 would not be appropriate given the evidence in the record.[6]

Defendants further argue that adding diagonal elements would run contrary to the claim language and specification because the lower tensioned portion of the tied arch must "assume most gravity induced stress" within the tied arch and, if diagonal elements are included, the diagonal elements, not the lower portion, "will assume the stress, either as tension or compression, depending on the orientation of the diagonal element." (Def. Mem. at 10 (quoting '9360 Patent at 01:54-57).)

[6] Defendants respond to this point by arguing that Claim 5 "does nothing more than add the limitation that the diagonal elements (if present) do not absorb horizontal stress. Thus, Claim 5 merely describes the stress feature of a diagonal member if it is present." (Def. Mem. at 11.) But Defendants provide no additional context to support this argument, for instance, whether diagonal elements would absorb other sorts of stress, and, although not of as much weight here, their expert also testified that Claim 5 did not preclude the use of diagonal elements. (Hr'g Tr. at 214:04-12 (Lack).)

Defendants argue that the construction of "to assume most gravity induced stress" is relevant to the construction of "tied arch," particularly as it bears on the relationship between the presence of diagonal elements and the patent's scope. The court, however, rejects this argument.[7]

* * *

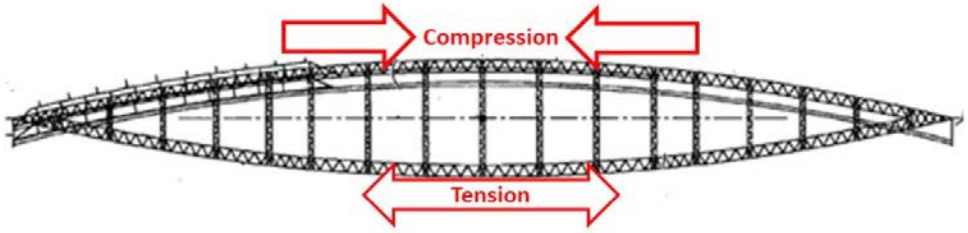
Addressing Defendants' argument requires a brief tangent. The parties agree that "the lower portion of the tied arch assumes as tension most of the gravity induced stress within the major truss" should be construed according to its plain and ordinary meaning. (Pl. Mem. at 9-10; Def. Mem. at 14.)[8] But the parties, somewhat ironically, disagree as to the plain and ordinary meaning. Plaintiff argues that a POSITA would understand the phrase, in context, to mean that the lower portion assumes most gravity induced stress as tension, rather than some other force (e.g., bending or compression.) (Pl. Mem. at 10.) Defendants argue that Plaintiff's construction only

[7] Defendants argue Plaintiff erroneously treats the disputed terms "tied arch" and "to assume most gravity induced stress" as if they are independent. (Def. Mem. at 4-5.) Plaintiff asserts that this argument is disingenuous, as "it was Defendants, as outlined in their July 20, 2018 Proposed Claim Constructions, who requested that these two terms should be construed separately." (Pl. Rep. at 1 n.1.)

[8] Defendants assert in the Joint Claim Terms Chart that the proper construction of "to assume most gravity induced stress" is "the lower portion assumes as tension more than 50% of the weight of the associated arch and the roof structure attached to it." (JCTC at 2.) In Defendants' brief, Defendants concede that the disputed phrase should be construed according to its plain and ordinary meaning and appear to abandon the construction proposed in the Joint Claim Terms Chart. (Def. Mem. at 14.)

addresses the nature of stress in the lower member, and assert that a POSITA would understand the phrase to mean that the lower portion assumes most of the gravity induced force *on the entire truss*. (Def. Mem. at 14.) The court agrees with Plaintiff's view of the phrase's plain and ordinary meaning.

As Dr. Nair testified, a POSITA would understand that a fundamental characteristic of tied arches is that gravity loads generally induce compression in the rib (i.e., the upper portion) and tension in the tie (i.e., the lower portion). (Nair Decl. ¶ 33.) Either the tie or the rib, however, may also experience bending, which induces tensile stress on parts of the component and compressive stress on other parts of the component. (*See id.*) The following diagram illustrates the distinct stresses on each of the arch components:



(Pl. Mem. at 10.) Plaintiff argues a POSITA would understand that, in context, "to assume most gravity induced stress" simply means that the lower portion of the arch assumes as tension most of the gravity induced stress within the major truss. (*Id.*)

Furthermore, to construe "tied arch" to mean the lower portion must absorb "most" of the stress on the entire arch

would turn it into a structure which is physically "impossible" to achieve. (Nair Supp. Decl. ¶ 10); *see, e.g.*, *Contour IP Holding, LLC v. GoPro, Inc.*, No. 17-CV-4738, 2018 WL 3428606, at *4 (N.D. Cal. July 16, 2018) (refusing to adopt proposed construction that was "physically impossible" to achieve). A POSITA would understand this, "given that in a tied arch, the gravity-induced stress is shared between the upper portion (primarily as compression) and the lower portion (primarily as tension)." (Nair Supp. Decl. ¶¶ 9-10.) The POSITA would also understand that the presence of either vertical or diagonal connecting members would not change this fact. (*Id.* ¶ 7.)

Plaintiff also persuasively argues that Defendants' proposed construction would conflict with various dependent claims set forth in the '9360 Patent. (Pl. Rep. at 7.) Claim 9 recites "[a] roof assembly according to claim 1, wherein said major truss is constructed and arranged to have a center of mass that is positioned substantially along a span axis that intersects both said first and second support locations." ('9360 Patent at 10:57-60.) Claim 10 recites "[a] roof assembly according to claim 9, wherein said major truss is shaped so as to be substantially symmetrical about said span axis." (*Id.* at 10:61-63.) And Claim 11 recites "[a] roof assembly according to claim 1, wherein said major truss is generally lenticular in shape." (*Id.* at 10:64-65.) These proposed structures could not

be reconciled with Defendants' interpretation of the term "to assume most gravity induced stress," nor could the preferred embodiment of a lenticular truss. (Nair Supp. Decl. ¶ 11.) Overall, a POSITA would understand the phrase, in context, to mean most gravity induced stress in the lower portion is assumed as tension, with the remainder assumed by other forces, such as bending. (*Id.* ¶ 12.)

The prosecution history similarly supports rejecting Defendants' construction of "to assume most gravity induced stress." During the examination, the examiner raised a prior art objection to Claim 1 based on U.S. Patent No. 5,257,481 (Reppas). (Ex. G, '9360 Patent File History, Oct. 1, 2003 Amendment, at 11.) The patentees explained, however, that Reppas "does not disclose any structure that could reasonably be deemed a tied arch." (*Id.*) As the patentees noted, in Reppas:

> The arcuate support rails 26 are anchored at their distal ends to a structural support ring that extends around the periphery of the stadium roof and further engages the respective ends of the other support rails 26 as well. In this type of structural design, it is necessary to have support rails 26 extending in a number of different directions in order to prevent ovalization of the structural support ring. There are no tensioned lower portions in the Reppas design that extend directly beneath the support rails 26 and that assume most of the gravity-induced stress therein as tension, as amended claim 1 requires. The structural support ring is not directly beneath the support rails 26. Moreover, the gravity-induced stresses from the arch are not absorbed within the support ring as pure tension - compressive stresses

> as the support ring is stressed are passed onto the underlying supports as compression.

(*Id.*) The patentees also distinguished another Reppas design:

> In an alternative interpretation of the reference wherein the arches 40 are considered to be the purported 'tied arch,' the Applicant points out that they cannot actually be considered tied arches because they are set in concrete footings that are anchored within the underlying soil. Neither soil nor concrete are considered by structural engineers as being capable of withstanding significant stress in tension. Accordingly, stresses that are passed on from the arch 40 to the footings will be absorbed primarily as compression of the soil that is at the outboard ends of the concrete footings, rather than as tension on the soil that is between footings.

(*Id.*) These statements did not require that the lower portion assume most of the tension in the entirety arch as stress, just that the lower portion – in this case, a connecting tie – absorbed the gravity induced stress as tension, rather than another force. (*See* Pl. Mem. at 10-11.)

Plaintiff does not request construction of the term, and the court finds that Defendants' proposed construction is not appropriate. In many instances, the court can simply reject an alternative reading and give a term its plain and ordinary meaning. But both parties here purportedly rely on the phrase's plain and ordinary meaning, so "reliance on a term's 'ordinary' meaning does not resolve the parties' dispute." *Eon Corp.*, 815 F.3d at 1318. As a result, and in light of the foregoing discussion, the court adopts Plaintiff's plain and ordinary

meaning of the disputed term, "to assume most gravity induced stress," i.e., that stress assumed in the lower portion is assumed as tension, not some other force.

* * *

Returning to the term "tied arch," the court turns to Defendants' next argument. Defendants argue that if diagonal elements were present, they would assume most gravity induced stress, not the lower portion. This argument is moot in light of the court's construction of "to assume most gravity induced stress." Just because a tied arch contains diagonal members does not mean the lower portion would not assume gravity induced stress as tension, rather than some other force. (*See* Nair Supp. Decl. ¶ 7.)

Defendants, nevertheless, cite to various portions of the specification which, they argue, support their narrow construction. Defendants first cite language in the specification where the patentees described other arches, most notably, a "Warren truss, [which] includes parallel upper and lower horizontal elements and a plurality of diagonal elements connecting the upper and lower horizontal elements." ('9360 Patent at 01:51-54.) But, as Plaintiff persuasively asserts, the patent merely describes an alternative type of truss, without clearly disclaiming or disavowing the use of diagonal

elements in a tied arch, or making clear that a tied arch or truss with a diagonal element is outside the invention's scope.[9]

Defendants next cite to Figure 3 of the specification, which shows an arch with a lack of diagonal connecting elements in the tied arch:

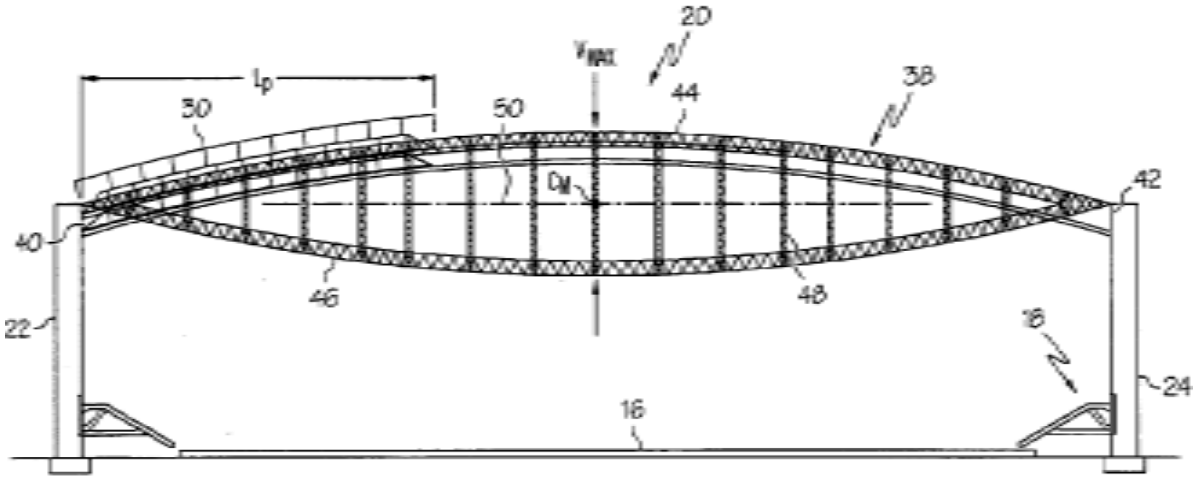


FIG. 3

(*Id.* at Fig. 3.) Again, however, nothing in the figure clearly excludes the use of any diagonal elements in the claimed invention. *See, e.g.*, *Thorner*, 669 F.3d at 1366 (noting that it is "not enough that the only embodiments, or all of the

[9] Defendants also argue that the '9360 patent describes a number of prior art trusses which have diagonal elements and "states that they are outside of the current invention." (Def. Mem. at 5.) Defendants rely on '9360 Patent at 01:44-02:04 for this argument. Yet, this portion of the patent does not expressly disavow diagonal elements, but merely notes drawbacks of said prior art trusses.

embodiments, contain a particular limitation" to constitute disavowal of claim scope).

The last portion of the specification Defendants cite is the patentees' statement that "[i]t is an *object of the invention* to provide an improved stadium roof design that will be lighter in weight, less bulky and less likely to interfere with the view of spectators within the stadium than the conventional stadium roof designs discussed above." ('9630 Patent at 02:07–11 (emphasis added).) The specification shows how the proposed invention could serve this end:

> According to one particularly advantageous feature of the invention, each of the major trusses 36, 38 are structurally configured as a tied arch having a curved convex upper portion and a lower portion that is shaped, sized and positioned to assume most gravity induced stress within the major truss as tension. *This permits elimination of most or all diagonal structural elements within the major trusses*, which has two advantages. First, in the event that a spectator is forced to look through a portion of one of the major trusses, disability [sic] will not be unnecessarily impaired by the presence of a large number of diagonal structural elements. Second, and more importantly, the tied arch configuration permits the major trusses to be substantially lighter in weight than would be required with conventional trusses.

(*Id.* at 04:38-52 (emphasis added).) Defendants also cite the '645 Provisional, in which the patentees stated they considered

one of the benefits of their invention over conventional trusses to be the following:

> As may be seen on sheet 24, drawing A-03, the trusses are constructed so as to have no diagonal elements. Horizontal stresses, instead of being resisted by the diagonal elements as is conventional, are assumed as tension in the bottom chord of each [of the] trusses. This reduces that weight of the super trusses, and thus the overall roof of the stadium.

('645 Provisional at 2.)

Defendants cite the above as illustrating, correctly, that a purpose of the claimed invention was to enable the construction of lighter, less obstructive trusses which permitted the elimination of diagonal trusses. Defendants state that the only way to achieve the object of Plaintiff's invention was to remove diagonal elements. (Def. Mem. at 5-6.) Yet, the purported object of the invention, without more evidence of disavowal, does not always limit claim scope. *See, e.g., E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1370 (Fed. Cir. 2003). In this case, as described above, although the invention *permits* the elimination of diagonal elements, the patent does not demand the exclusion of all, or even most, diagonal elements as set forth in Claim 1. Although use of diagonal elements may make it "particularly difficult to obtain certain benefits of the claimed invention, this does not rise to the level of

disavowal of the structure." *Thorner*, 669 F.3d at 1366 (quotation omitted).

In addition to citing the specification, Defendants also argue that the prosecution history supports a narrower construction of "tied arch" in the context of the '9360 Patent. Defendants first cite to the patentees' Amendment dated October 1, 2003, in which the patentees thanked the examiner for a preceding interview and quoted the portion of the specification, excerpted above, indicating that the claimed invention "permits elimination of most or all diagonal structural elements within the major trusses." ('9360 Patent File History, Oct. 1, 2003 Amendment, at 10.) The patentees stated that "[a]t the conclusion of the interview, Applicant agreed to provide these remarks describing what a tied arch is and how it is not taught or disclosed by the references of the record." (*Id.* at 11.)

Yet, the quoted portion only indicates that the claimed invention *permits* elimination of most diagonal members. ('9360 Patent at 04:38-52.) The quoted portion of the specification does not *require* that most diagonal members be eliminated, and it cannot serve as a disclaimer of the claim scope. *See Omega Eng'g Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325-26 (Fed. Cir. 2003) ("[F]or prosecution disclaimer to attach, . . . the alleged disavowing actions or statements made during prosecution [must] be both clear and unmistakable.").

And, the patentees never indicated that the term "tied arch" was limited to the particular embodiment included in the specification, nor relied on said embodiment to distinguish its claimed invention over prior art. Reading in the additional element proposed by Defendants unnecessarily narrows the construction of "tied arch," when nothing in the plain language of the term "tied arch" implies that a "tied arch" ceases to be a "tied arch" based on the addition or removal of limiting elements, like diagonal members.

Defendants next argue that the prosecution history disclaimer should operate to preclude Plaintiff's proposed construction. (Def. Mem. at 13.) Defendants state that Plaintiff's present construction only requires "[a]n arch in which the ends are connected with a connecting member," connected to "cement footings, or to the soil, or to any other connecting member," in contravention of Plaintiff's representations during prosecution. (*Id.*) The patentees' position was more nuanced.

Defendants' argument stems from an obviousness rejection raised by the patent examiner based on U.S. Patent No. 5,287,481 (Reppas), which the court summarized above. (Ex. DD, June 20, 2003 Office Action at 2.) To reiterate, the patentees responded to the examiner's rejection by arguing that Reppas did not actually disclose a tied arch, but instead a traditional

arch. (Ex. EE, U.S. Patent No. 5,287,481 (Reppas), at Fig. 3, Fig. 4; '9360 Patent File History, Oct. 1, 2003 Amendment at 11.) The patentees explained that the arches included in Reppas cannot be considered tied arches because the ends were not connected. (Oct. 1, 2003 Amendment at 11.) Instead, the ends were anchored by concrete anchors. (*Id.*) This prosecution history would disavow, for instance, a proposed construction by Plaintiff that the ends need not be connected by a connecting member; but the prosecution history is consistent with Plaintiff's proposed construction.

As a final matter, Defendants cite certain extrinsic evidence to support their argument that a POSITA would understand that a tied arch contains no diagonal elements. (Def. Mem. at 8-9.) For instance, Defendants cite a prior article by Dr. Nair, in which he included a figure, described as a tied arch, containing only vertical hanger members. (*See* Ex. 3, R. Shankar Nair, *Buckling and Vibration of Arches and Tied Arches*, 112 J. OF STRUCTURAL ENGINEERING, no. 6, 1986.) At the hearing, however, Dr. Nair explained that the article discussed "the type of structure [he] had written th[e] analysis for" and his discussion of tied arch "wasn't meant to be an exhaustive definition of a tied arch." (Hr'g Tr. at 113:05-08.)

Accordingly, the court adopts Plaintiff's construction of "tied arch" as "an arch in which the ends are connected with

a connecting member." The court adopts Plaintiff's construction of the plain and ordinary meaning of "to assume most gravity induced stress" to mean that most of the stress on the lower portion of the tied arch is assumed as tension.

2. Alleged Means-Plus-Function Terms: "Retention Mechanism" and "Retention Element"

"Retention mechanism" and "retention element" are recited in the '9630 Patent as follows:

> [A] **retention mechanism** for preventing said roof member from being lifted upwardly with respect to said guide track wherein said **retention mechanism** comprises at least one **retention element** for engaging a downwardly facing surface of said guide track in the event of initiation of upward vertical movement of said roof member relative to said guide track.

('9360 Patent at 10:20-26 (emphasis added).) As the parties dispute whether these qualify as means-plus-function terms, the court begins with a review of the law applicable to such terms.

Patent claims using a "means-plus-function" limitation are governed by 35 U.S.C. § 112 ¶ 6 (pre-AIA), which provides:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. § 112 ¶ 6 (pre-AIA).

"Under means plus function claiming, an inventor may draft a claim element in a manner that only describes a function

without describing a particular structure that performs that function." *Integrity Worldwide, LLC v. Rapid-EPS LTD.*, No. 17-CV-55, 2018 WL 3609430, at *4 (N.D. Tex. May 29, 2018) (citing *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347 (Fed. Cir. 2015)). "This allows the claim element to cover structures that could perform that function." *Id.* The tradeoff, however, is that the resulting means-plus-function claim is construed to cover "only the structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof." *Williamson*, 792 F.3d at 1347.

Whether 35 U.S.C. § 112 ¶ 6 applies to a claim element depends on the claim language. *Id.* at 1348-50. Use of the word "means" followed by a description of a function creates a rebuttable presumption that 35 U.S.C. § 112 ¶ 6 applies. *Id.* If the claim language does not describe the claim element in this manner, including by not using "means," there is a rebuttable presumption that 35 U.S.C. § 112 ¶ 6 does not apply. *Id.* This rebuttable presumption is overcome when "the claim term fails to 'recite sufficiently definite structure' or else recites 'function without reciting sufficient structure for performing that function.'" *Id.* (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed.Cir.2000)) (alteration omitted). Where a claim uses a substitute term as a generic placeholder for the term "means," the question is "whether the words of the

claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure." *Id.*

Plaintiff argues the terms "retention mechanism" and "retention element" should be given their plain and ordinary meaning. (Pl. Mem. at 11.) Defendants argue that "retention mechanism" should be construed as shown in "Figs. 6, 7, and 9 and the corresponding description at col. 5, lines 42-45, 61-67, and col. 7, lines 3-22, and structural equivalents (structure that continuously biases each carrier assembly downward toward the supporting rail so as to maintain traction of the drive wheel on the rail during movement)." (Def. Supp. Mem. at vi.) Defendants argue that "retention element" should be construed as shown in "Fig. 9 and the corresponding description at col. 7, lines 12-16, and structural equivalents (wheels)." (*Id.*)

The court agrees with Plaintiff's construction as to "retention mechanism" and Defendants' construction as to "retention element."[10]

Because Claim 1 does not contain the word "means," there is a rebuttable presumption that § 112 ¶ 6 does not apply.

[10] Relevant here, Defendants also argued at the *Markman* hearing and in their post-hearing brief that the '9360 Patent only applies to retractable roofs utilizing traction drives. (*See* Def. Supp. Mem. at 7.) Even if the court found this argument not waived for failure to assert it prior to the *Markman* hearing, it would fail on the merits. Defendants argue that the '9360 Patent was intended to resolve the problem of utilizing traction drives on arched roofs. Defendants note that, prior to 2001, cable drum drives and rack and pinion drives had already been used on stadia with arches, including tied

Williamson, 792 F.3d at 1348. Defendants, however, argue that this presumption is rebutted because both disputed terms use "nonce" terms: mechanism and element. *See id.* at 1350. It is correct that 35 U.S.C. § 112 ¶ 6 may apply when the claim language uses a "nonce" word in place of the word "means." *Id.* at 1350. "A nonce word is a verbal construct that is not recognized as the name of structure and is simply a substitute for the term 'means for.'" *Integrity Worldwide*, 2018 WL 3609430, at *4. Examples of such "nonce" words include mechanism, element, and device. *Williamson*, 792 F.3d at 1350; *see also Media Rights Techs v. Capital One Fin. Corp.*, 800 F.3d 1366, 1374 (Fed. Cir. 2015) ("We have never found that the term 'mechanism' – without more – connotes an identifiable structure."); *Welker Bearing Co. v. PHD, Inc.*, 550 F.3d 1090, 1096 (Fed. Cir. 2008) ("[T]the unadorned term 'mechanism' is simply a nonce word or a verbal construct that is not recognized as the name of structure . . . ."") (quotation omitted).

But a structural modifier further describing a nonce term can imbue said nonce term with sufficient structure to

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arches, while traction drives had only been used on flat roofs. Defendants also cite the '645 Provisional, which they argue suggests the patentees sought to develop and patent a retractable roof with the "novel combination of a traction drive on an arched retractable roof." (*Id.*) Yet, adopting this construction would ignore the absence of any clear disavowal of the cable drum drive, and would improperly import a limitation from Claim 7, namely, "a drive system for powering at least one of said first and second wheels" in the roof assembly, into independent Claim 1. Such a reading is disfavored.

place it beyond 35 U.S.C. § 112 ¶ 6. *See Massachusetts Institute Of Technology v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir. 2006) ("Claim language that further defines a generic term like 'mechanism' can sometimes add sufficient structure to avoid 112 ¶ 6."). Many devices take their names from the function that they perform. *See Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996). Examples include "detent mechanism," *id.*; "locking mechanism," *Integrity Worldwide*, 2018 WL 3609430, at *5; "movement mechanism," *Nanology Alpha LLC v. WITec Wissenschaftliche Instrumente und Technologie GmbH*, No. 16-CV-445, 2017 WL 5905272, at *10 (E.D. Tex. Nov. 30, 2017); and "fastening mechanism," *Blackbird Tech LLC v. ELB Elecs.*, No. 15-CV-56, 2016 WL 7451622, at *5 (D. Del. Dec. 28, 2016), *vacated on other grounds*, 895 F.3d 1374 (Fed. Cir. 2018).

i. **"Retention Mechanism" (Claim 1)**

In the term "retention mechanism," the modifier "retention" provides sufficient structure when modifying the term "mechanism" to place the claim outside the scope of 35 U.S.C. § 112 ¶ 6. A retainer is widely defined as "[a] device that holds a mechanical component in place," (Ex. H, McGraw-Hill Dictionary of Scientific and Technical Terms at 1699 (5th ed. 1994)), or "[o]ne that retains, as a device, frame, or groove that restrains or guides," (Ex. I, American Heritage College

Dictionary at 1164 (3rd ed. 1997)). *See TRIC Tools, Inc. v. TT Techs., Inc.*, No. 12-CV-3490, 2014 WL 2880028, at *14-15 (N.D. Cal. June 24, 2014) (relying on definition of "retention" to construe "retention feature" as "a structural element that keeps one or more other elements in place"). A POSITA would understand a "retention mechanism" to be "a device that holds a component in place or limits or controls its movement." (Nair Decl. ¶ 34.)

The court acknowledges that terms such as "detent mechanism," found to be outside the boundaries of 35 U.S.C. § 112 ¶ 6 by the Federal Circuit, may imply a narrower set of structures. *Greenberg*, 91 F.3d at 1583. Yet, even there, "the term 'detent' d[id] not call to mind a single well-defined structure," and "the same could be said of other commonplace structural terms such as 'clamp' or 'container.'" *Id.* "What is important is not simply that a 'detent' or 'detent mechanism' is defined in terms of what it does, but that the term, as the name for structure, has a reasonably well understood meaning in the art." *Id.* That is the case here.

More importantly, the intrinsic evidence provides sufficient structure, read in context, for the cited retention mechanism. The '9360 Patent explains that the "retention mechanism" is utilized for "preventing roof members from being lifted upwardly" from the guide track and comprises at least one

"retention element for engaging a downwardly facing surface of the guide track when there is upward vertical movement of the patented roof member relative to said guide track." ('9360 Patent at 10:20-26.) This description provides sufficient detail as to how the retention mechanism interacts with other components in the carrier assembly in a way that informs the structural character of the retention mechanism in question.

Even if "retention mechanism" did constitute a means-plus-function limitation, Defendants' analysis is incorrect. Courts construe means-plus-function limitations by (1) identifying the claimed function, and (2) identifying the corresponding structure that performs that function. *See Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1332 (Fed. Cir. 2006). The function includes the limitations contained in the claim language, whereas the structure includes the structure or material disclosed in the patent's specification that performs the claimed function, as well as any equivalents of the disclosed structure or material. *See Easyweb Innovations, LLC v. Twitter, Inc.*, No. 11-CV-4550, 2016 WL 1253674, at *14-15 (E.D.N.Y. Mar. 30, 2016), *aff'd*, 689 F. App'x 969 (Fed. Cir. 2017).

"[T]he [means-plus-function] statute does not permit limitation of a means-plus-function claim by adopting a function different from that *explicitly* recited in the claim." *In re*

Teles AG Informationstechnologien, 747 F.3d 1357, 1367-68 (Fed. Cir. 2014) (emphasis added) (quoting *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999)); *see also Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1113 (Fed. Cir. 2002) ("The court must construe the function of a means-plus-function limitation to include the limitations contained in the claim language, and only those limitations. It is improper to narrow the scope of the function beyond the claim language."). The function recited in Claim 1 is "preventing said roof member from being lifted upwardly with respect to said guide track." ('9360 Patent at 10:20-26.) Yet, Defendants seek to depart significantly from this function and construe it as requiring a "structure that continuously biases each carrier assembly downward toward the supporting rail so as to maintain traction of the drive wheel on the rail during movement." (Def. Supp. Mem. at vi.) Defendants' proposed construction of the recited function is unduly narrow.[11]

Furthermore, Defendants' construction requires continuous biasing and conflicts with the plain language of Claim 1. Claim 1 requires "at least one retention element for engaging a downwardly facing surface of [the] guide track *in the*

[11] The court also rejects Defendants' argument that "preventing said roof member from being lifted upwardly" requires that there be *no* movement whatsoever for reasons stated more detail later in this Memorandum & Order.

event of initiation of upward vertical movement of said roof member relative to said guide track." ('9360 Patent at 10:21-25 (emphasis added).) Reading the claim to impose the restriction requested by Defendants would, in effect, improperly read the "in the event of initiation of upward vertical movement of said roof member" out of the claim. *See Power Mosfet Techs., L.L.C. v. Siemens AG*, 378 F.3d 1396, 1410 (Fed. Cir. 2004) (explaining that a claim construction that renders claim terms superfluous is generally disfavored).

Adopting Defendants' proposed construction of the relevant function, which requires "biasing," would also render the limitations of more than one dependent claim redundant. Claim 6 of the '9360 Patent states, in relevant part:

> A roof assembly according to claim 1, wherein said roof member comprises a first wheel that is engaged with an upwardly facing surface of said guide track and wherein said *retention element comprises a second wheel* that is engaged with said downwardly facing surface of said guide track and further comprising a *biasing mechanism for biasing the first wheel toward the second wheel, whereby both the first wheel and the second wheel will be urged against the guide track.*

('9360 Patent at 10:39-46 (emphasis added).) Claim 6 differentiates between the "biasing mechanism," which biases one wheel towards a second wheel to urge it against a guide track, and the "retention mechanism," which includes no mention of biasing but is described as "preventing [the] roof [] from being lifted upwardly with respect to the guide track. (*Id*. at 10:21-

26, 39-46.)[12] Claim 8 is dependent on Claim 6 and also requires biasing one wheel towards a second wheel to ensure adequate traction, another limitation Defendants seek to read into Claim 1. (*Id.* at 10:50-56.)

Overall, the court finds that retention mechanism is not a means-plus-function limitation and should be given its plain and ordinary meaning.

ii. **"Retention Element" (Claim 1)**

Defendants argue that the term "retention element" lacks sufficient structure and, as a result, must be construed as a means-plus-function limitation. As noted above, the court's conclusion for "retention mechanism" was bolstered by the additional information in the intrinsic evidence, as well as the relevant extrinsic evidence, adding sufficient structure to the retention mechanism. The modifier "retention" in "retention element" provides some additional information as to the function of the element and its structure but, unlike with respect to

[12] Defendants argue that Claim 6 is narrower than their construction of Claim 1: "Claim 6 requires 'a biasing mechanism for biasing the first wheel toward the second wheel, whereby both the first wheel and the second wheel will be urged against the guide track.' Defendants' construction of 'retention mechanism' requires only a downward bias of each carrier assembly toward the supporting rail and does not require biasing first and second wheels toward each other." (Def. Mem. at 19-20 (quoting '9360 Patent).) This argument places form over substance. Per Claim 6, the first wheel is part of the roof assembly and is engaged with the top of the guide track, and the second wheel is engaged with the lower portion of the guide track. ('9360 Patent at 10:39-46.) Biasing the first wheel (connected to the roof member) towards the second wheel (under the guide rail) itself biases the carrier assembly towards the supporting rail.

"retention mechanism," the claim itself provides no additional structure. The claim notes only that the retention element is "for engaging a downwardly facing surface of said guide track in the event of initiation of upward vertical movement." ('9360 Patent at 10:23-26.) The court thus finds that "retention element" should be construed as a means-plus-function limitation.

Having found that "retention element" is a means-plus-function limitation, the court must identify and construe (1) the claimed function and (2) the corresponding structure that performs that function. *See Applied Med.*, 448 F.3d at 1332. Here, the claimed function states that the retention element is "for engaging a downwardly facing surface of said guide track in the event of initiation of upward vertical movement." ('9360 Patent at 10:23-26.) For the reasons noted above (and below), the court finds it would not be appropriate to limit the function to incorporating a continuous biasing requirement. With the appropriate function identified, the court must next identify the corresponding structure that performs this function.

Defendants identify "Fig. 9 and the corresponding description at col. 7, lines 12-16, and structural equivalents (wheels)" as the structure required which performs the recited

function. (Def. Supp. Mem. at vi.) The cited portion reads as follows:

> As may be seen in FIG. 9, retention assembly 72 preferably includes a pair of wheels 110, 112, that are amounted for rotation with respect to a rail spanning member 116 so that each wheel is rotatably engaged with a portion of the downwardly facing surface 82 of the rail 52.

('9360 Patent at 07:12-16.) Defendants further seek to limit the construction of this term to "wheels." (Def. Supp. Mem. at vi.) Although the court agrees that wheels are identified as serving the cited function in the preferred embodiment noted in the patent's specification, limiting the construction of retention element to nothing broader than "wheels" is unduly limiting.

The specification states that the retention assembly "*preferably* includes a pair of wheels 110, 112 that are amounted [sic] for rotation with respect to a rail spanning member 116 so that each wheel is rotatably engaged with a portion of the downwardly facing surface 82 of the rail 52." ('9360 Patent at 07:12-16 (emphasis added).) Figures 8 and 9 illustrate:

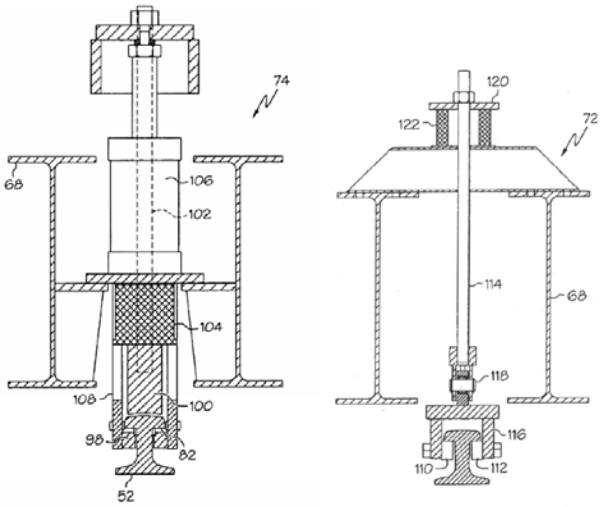

FIG. 8 FIG. 9

(*Id.* at Fig. 8, Fig. 9.) That the assembly need only "preferably" include wheels suggests that other items serving a similar function may be substituted for wheels. Similarly, whereas the specification provides that the wheels in the embodiment described are "rotatably engaged" with the downwardly facing surface of the rail, Claim 1 does not require that the "retention element" be rotatably engaged with the downwardly facing surface of the rail, further suggesting that retention element, as used in Claim 1, is broader than just "wheels."

Defendants' construction of "retention element" as "wheels" would also import limitations from dependent Claim 6 into independent Claim 1. Claim 6 provides that the "retention element comprises a second wheel." (*Id.* at 10:39-46.) Reading "retention element" to mean "wheels" would read this distinct claim out of the patent, a result which is not supported by the remainder of the intrinsic evidence. *See Phillips*, 415 F.3d at

1315 ("Differences among claims can also be a useful guide in understanding the meaning of particular claim terms.").

In light of the above, the court agrees the term "retention element" is a means-plus-function claim limited to the structures disclosed in the specification, namely, wheels and their structural equivalents, which perform the function of "engaging a downwardly facing surface of said guide track in the event of initiation of upward vertical movement." But the court declines to find at this time that structural equivalents are limited only to "wheels." *See Easyweb*, 2016 WL 1253674, at *14 (noting that a structure not sufficiently disclosed in the specification may be protected through "structural equivalence" if differences between structure disclosed in specification and undisclosed structure are "insubstantial," *i.e.*, "if the assertedly equivalent structure performs the claimed function in substantially the same way to achieve substantially the same result as the corresponding structure described in the specification") (quoting *Odetics, Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 1267 (Fed. Cir. 1999)).

3. "Preventing Said Roof Member From Being Lifted Upwardly . . . In The Event of Initiation of Upward Vertical Movement" (Claim 1)

The term "preventing said roof member from being lifted upwardly . . . in the event of initiation of upward vertical movement" appears in Claim 1 as follows:

> [A] retention mechanism for **preventing said roof member from being lifted upwardly** with respect to said guide track wherein said retention mechanism comprises at least one retention element for engaging a downwardly facing surface of said guide track **in the event of initiation of upward vertical movement** of said roof member relative to said guide track.

('9360 Patent at 10:20-26.) Plaintiff argues that the phrase should be given its plain and ordinary meaning. (Pl. Mem. at 16.) Defendant initially argued that the phrase should be construed as "preventing any upward movement of the drive wheel and roof member" and, following the *Markman* hearing, modified its construction to "preventing any upward movement of the roof member (which is defined to include the drive wheel) so as to maintain traction of the drive wheel on the rail during movement." (Def. Mem. at 20; Def. Supp. Mem. at vi.) For the reasons that follow, the court agrees with Plaintiff that the plain and ordinary meaning applies.

A POSITA would understand that the object of this claim is to prevent the roof panels from being lifted to an extent that the wheels derail from the track. (*See, e.g.*, Nair Decl. ¶ 37.) No construction is necessary. *See Brandt Indus., Ltd. v. Harvest Int'l Corp.*, No. C15-4049, 2016 WL 1452402 (N.D. Iowa Apr. 13, 2016) (rejecting argument of accused infringer that the term "to prevent at least the outer portion of the return run of the endless belt from moving vertically" should be

construed to allow no vertical movement at all as the object of this claim was to keep the conveyor belt on track).[13]

Defendants, citing Claim 1, respond that the purpose of the retention mechanism is to prevent the roof member from being lifted upwardly from the guide track. (Def. Mem. at 20-21.) But Defendants then stretch further and argue that, in light of the purpose and the language, a POSITA would understand the phrase to mean that *no* movement whatsoever is permitted. (*Id.*) This argument reaches too far.

Defendants point to the language in the claim indicating that the retention mechanism is for "*preventing* said roof member from being lifted upwardly with respect to said guide track" ('9360 Patent at 10:21–23 (emphasis added)), and that the retention element is "for engaging a downwardly facing surface of said guide track in the event of initiation of upward vertical movement of said roof member relative to said guide track" (*id.* at 10:24–27). (Def. Mem. at 21.) Indeed, the stated purpose of the retention assembly "is to *continuously bias* each of the carrier assemblies [] downwardly toward the supporting rail [] so as to *maintain sufficient traction* of the

[13] Defendants incorrectly seek to distinguish *Brandt* on the grounds that "no court ruling was required" in that case as to the term "prevent." (Def. Mem. at 22.) Yet, as Plaintiff notes, the accused infringer argued that the term "should be construed to disallow all movement," and the court instead issued a ruling that "'to prevent at least the outer portion of the return run of the endless belt from moving vertically' should be given its plain and ordinary meaning." *Brandt*, 2016 WL 1452402, at *22-23.

drive wheel [] on the rail [] to ensure that the drive mechanism will be able to move movable roof panels as desired." ('9360 Patent at 7:3–8 (emphasis added).) Defendants argue the only way to ensure continuous traction between the drive wheels and the rail is to prevent any upward vertical movement of the wheels that would cause separation from the rail as no traction can occur if the wheels separate from the rail. (Def. Mem at 30-31.)

As an initial matter, contrary to Defendants' argument, the claim language and specification suggest that at least some movement will occur: the retention mechanism will engage the downwardly facing surface of the guide track "in the event of initiation of upward vertical movement of said roof member relative to said guide track." ('9360 Patent at 10:24-25.) This language suggests that the roof must move upwardly to some extent before the retention mechanism activates and engages the guide track. Similarly, the specification states that the lower brake shoes "assist the retention assembly 72 in resisting upward forces" when the roof lifts upward such that the brake shoes contact the rail; this suggests movement, as the accompanying figure clearly illustrates a gap between the lower brake shoes and the guide rail, meaning it must move upward to some degree before assisting. (*Id.* at 06:64– 07:01, Fig. 8.)

Furthermore, Defendants' construction would require a physical impossibility. It is not possible to design a roof over a large structure with no upward movement whatsoever. (*See* Nair Decl. ¶ 38.) In reality, external forces, such as changing temperatures or strong winds, would inevitably cause the roof to move and deflect upward. (*See id.*) Courts routinely reject proposed constructions which are physically impossible to achieve. *See, e.g.*, *Contour IP Holding*, 2018 WL 3428606, at *4; *San Disk Corp. v. Round Rock Research LLC*, No. 11-CV-5243, 2013 WL 1899790, at *5 (N.D. Cal. May 7, 2013) (giving "perpendicular to" plain and ordinary meaning as two surfaces could only be perpendicular to one another in a theoretical construct); *see also AIA Eng'g Ltd. v. Magotteaux Int'l S/A*, 657 F.3d 1264, 1278 (Fed. Cir. 2011) ("[A] construction that renders the claimed invention inoperable should be viewed with extreme skepticism.") (quotation omitted).

Defendants attempt to rely on *Cloud Farm Associates v. Volkswagen Group of America*, which construed the terms "prevent flow of said fluid" and "prevent any flow of said fluid" to mean "to stop flow." 674 F. App'x 1000, 1009 (Fed. Cir. 2017). *Cloud Farm* is distinguishable. In *Cloud Farm*, the specification recited an "embodiment that completely stops the flow of hydraulic fluid." *Id.* at 1007-08. The embodiment did not just say it *stopped* flow, but added the qualifier "completely." *See*

id. Furthermore, it is more plausible that a device could completely stop the flow of liquid than that the retention mechanism could prevent all upward movement, given that the latter will be caused by the exertion of external forces beyond the designer's control.

Finally, Defendants argue that there must be sufficient traction for the drive wheel to function at all times, so there must be constant contact. (*See* Def. Mem. at 21-22.) Claim 7, which relies on Claim 1, recites a system "further comprising *a drive system for powering at least one of said first and second wheels*." ('9360 Patent at 10:47-49 (emphasis added).) Defendants' construction improperly imports a limitation from a dependent claim into independent Claim 1. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004) ("[T]he presumption that an independent claim does not have a limitation that is introduced for the first time in a dependent claim is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim.") (quotation omitted). Because Claim 1 recites no drive wheels, Defendants' traction argument does not apply.

Accordingly, the court finds that "preventing said roof member from being lifted upwardly . . . in the event of

initiation of upward vertical movement" need not be construed and should be given its plain and ordinary meaning.

B. Terms in the '4360 Patent

The '4360 Patent discloses a lateral release system for movable roof panels in a retractable roof structure. (Ex. P, '4360 Patent, at Abstract; Pl. Mem. at 18.) Uni-Systems developed the '4360 Patent to address the need for an improved design for a retractable roof and transport mechanism that was compact, lightweight, reduced the structural requirements for the supporting structure, and was capable of maintaining its stability and alignment during normal use and in extreme conditions more capably than comparable mechanisms previously known. (*Id.*) The '4360 Patent, which derives its priority from United States Provisional Application No. 60/659,848 (the "'848 Provisional"), was filed on March 3, 2006, and issued on September 29, 2009 with 21 claims. (*Id.* at 1.)

The '4360 Patent explains that it is difficult to establish and maintain two perfectly parallel tracks on which the roof panels will rest and travel. (*Id.* at 02:01-04.) Factors such as pressure or changes in the weather can cause the tracks to move. (*Id.* at Abstract.) The invention sought to address this problem by placing a fixed transporter on one side of the roof, and a lateral release transporter on the other side

of the roof, allowing the wheels to remain stationary on the track, even as the roof expands or shrinks. (*Id.*)

The parties dispute the proper construction of the following terms in the '4360 Patent: (i) "a lateral release system for each of said transport mechanism"; (ii) "interposed between"; (iii) "stable movement"; (iv) "limited amount of movement"; (v) "very small side load"; and (vi) "no need for additional lateral reinforcement." The disputed claims in the '4360 Patent appear in Claims 1, 14, and 21. (*Id.* at 05:62-06:17, 06:55-07:10, 08:1-26.) The court will address the proper construction of each disputed term in turn.

1. *"A Lateral Release System for Each of Said Transport Mechanism" (Claims 1, 14, and 21)*

The disputed term "a lateral release system for each of said transport mechanism" appears in Claims 1, 14, and 21, which are substantially similar in this respect. Claim 1 reads, in relevant part, as follows:

> The System for supporting a large overhead structural member for stable movement with respect to an underlying structure, comprising:
>
> **first and second transport mechanisms**, each of which is constructed and arranged to permit the large overhead structural member to move in a predetermined path with respect to the underlying structure, **said transport mechanism comprising** a single trolley rail on the underlying structure with no additional rail and a plurality of rail follower wheels on the large overhead structural member that are adapted to ride on said single

> trolley rail; and
>
> **a lateral release system for each of said transport mechanism**, interposed between said rail follower wheels and the large overhead structural member, for maintaining the transport mechanism in a predetermined orientation while simultaneously permitting a limited amount of movement of the large overhead structural member in a direction that is nonparallel to said predetermined path, wherein said system transmits a very small side load to said single trolley rail with no need for additional lateral reinforcement, said lateral release system comprising a linear slide bearing.

('4360 Patent at 05:62-06:17 (emphasis added).)

The parties agree that "said transport mechanism" should be construed to mean "each of the first and second transport mechanisms." (*See* JCTC at 10.) The parties further agree that, in light of that construction, the first and second transport mechanisms each have a lateral release system. The only dispute is whether the first and second transport mechanisms, with their respective lateral release systems, must be located on opposite sides of the roof system. Plaintiff argues that plain and ordinary meaning, which should govern, does not compel this outcome. (Pl. Mem. at 25.) Defendants argue that the intrinsic evidence, which is consistent with the plain meaning, does compel such an outcome. (Def. Mem. at 36-38.) The court agrees with Plaintiff that it is not appropriate to read the "opposite" limitation into the claim. No construction is necessary, and the term "a lateral release

system for each of said transport mechanism" should be interpreted in accordance with its plain and ordinary meaning, without ascribing any requirement that the lateral release systems for the first and second transport mechanisms be on opposite sides.

The preferred embodiment of the patent is illustrated by Figure 2, which confirms that the lateral release system (identified by number 29) ideally appears on only one side of the stadium:

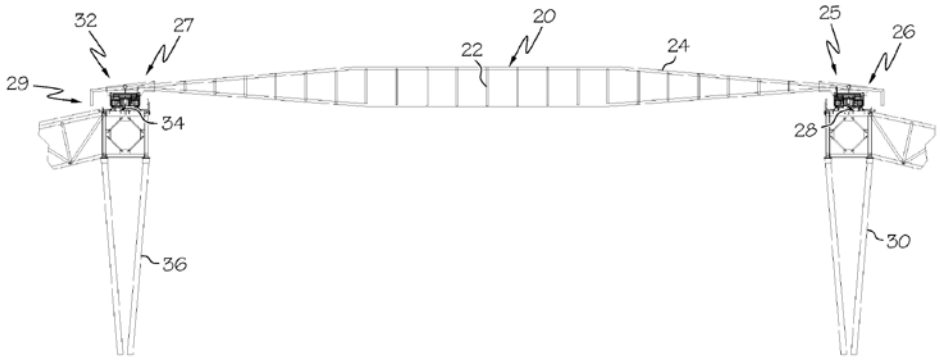

FIG. 2

('4360 Patent at Fig. 2.) The specification confirms that, in the preferred embodiment, the lateral release system appears on only one side of the roof panel:

> The first end 25 of the second movable roof panel 20 is preferably securely mounted to the first transport mechanism 26, *while the second end 27 of the second movable roof panel 20 is provided with a lateral release system 29* . . . .

(*Id.* at 04:35-43 (emphasis added).) The abstract, similarly, confirms the rationale behind this specification, indicating

that "[t]he lateral release system has been found to be most effective when it is provided at but one end of the roof member." (*Id.* at Abstract); *see also Hill-Rom Co. v. Kinetic Concepts, Inc.*, 209 F.3d 1337, 1341 n.* (Fed. Cir. 2000) ("We have frequently looked to the abstract to determine the scope of the invention.") (collecting cases). This provides clear support for Plaintiff's argument that the lateral release systems need not be on opposite sides of the stadium.[14]

The '848 Provisional, which was incorporated by reference into the '4360 Patent, also supports Plaintiff's position. The '848 Provisional describes a retractable roof with "two large roof panels . . . installed *on one side of each roof panel* between the roof and carriers." ('848 Provisional at 9; *see also* Nair Supp. Decl. ¶ 29.) The described roof is illustrated in Figure 1:

[14] Defendants argue the same mechanization "plainly" appears from the drawing on both sides. (Def. Supp. Mem. at 25.) This argument is unavailing. The patentees labeled separate ends, rails, and other components on *both* sides of the roof apparatus, but did not do so for a lateral release mechanism. (*See* '4360 Patent at Fig. 2.) Given that the patentees appear to have intended to label each element in the figure where it existed, and in light of the remaining evidence in the patent, the absence of an indication that a lateral release mechanism in a similar picture cannot be found by this court to be solely the result of an inadvertent omission.

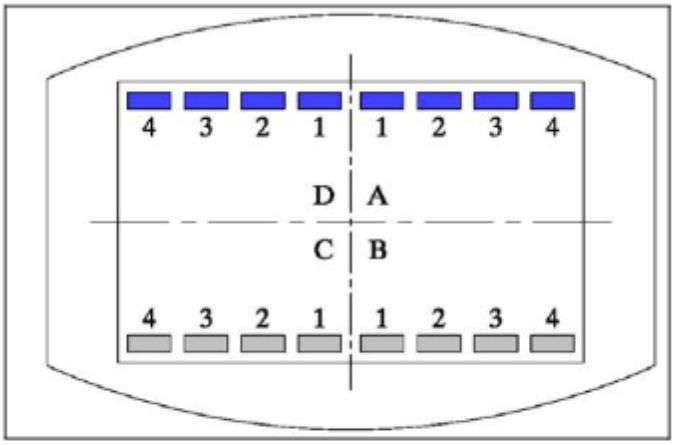

Figure 1: Operable roof and carrier layout. Carriers in blue have linear bearings.

('848 Provisional at Fig. 1.) Figure 1 in the '848 Provisional, like Figure 2 in the '4360 Patent, supports Plaintiff's argument that the lateral release mechanisms need not be located on opposite sides of the stadium. (*See also id.* at 69 (providing additional illustration stating that one end of the roof panel remains fixed to the mechanism while the other is "released for lateral movement by lateral bearing").)

Furthermore, Figure 5 of the '9360 Patent, which is incorporated by reference into the '4360 Patent (*see* Def. Mem. at 25 n.1; Pl. Rep. at 21), depicts multiple carrier assemblies on one side of the roof panel:

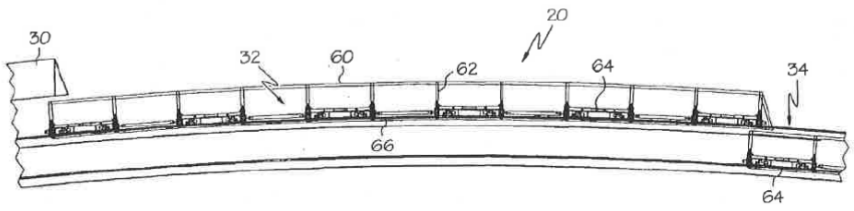

FIG. 5

('9360 Patent at Fig. 5.) The accompanying portion of the specification shows that "64" refers to a "plurality of carrier assemblies," as shown above. (*Id.* at 05:21-27, 05:38-41.) This is, again, in line with a POSITA's understanding that if a roof panel of significant length, there would be at least two transport mechanisms supporting each side. (*See* Nair Supp. Decl. ¶ 30.) By contrast, no embodiments in the specification include lateral release systems on opposing sides of the roof.

Although Defendants concede the preferred embodiment shown in Figure 2 of the specification does not include lateral release systems on opposite ends, they argue that the claim language indicates that must be the case. (*See* Def. Mem. at 38.) Defendants point to a portion of the specification describing Figure 2, which explains that:

> The first end 25 of the second movable roof panel 20 is preferably securely mounted to the *first transport mechanism 26*, while the second end 27 of the second movable roof panel 20 is provided with a lateral release system 29 that maintains *the transport mechanism* in a predetermined orientation . . . .

('4360 Patent at 04:35-43 (emphasis added).) Defendants argue that as the claim language requires each transport mechanism to have a lateral release system, the lateral release systems, like the transport mechanisms, must necessarily be on opposite sides of the roof system. (Def. Mem. at 38.)

In their post-hearing briefing, Defendants also cite

to the fact that each transport mechanism is comprised of "a single trolley rail." (Def. Supp. Mem. at 25.) Defendants then note that the specification depicts the two trolley rails on opposite sides of the roof (*see* specification defining "28" and "34" in Figure 2 as trolley rails). Because each of the first and second transport mechanisms must have a lateral release mechanism pursuant to the parties' agreed-upon construction (i.e., that "said transport mechanism" refers to "each of said first and second transport mechanisms"), Defendants argue that the claim requires that the lateral release systems be located on both sides of the roof apparatus.

Defendants further argue that the prosecution history supports their position. Defendants assert that the patentees added the disputed phrase by amendment to secure issuance of the '4360 Patent. (Def. Mem. at 39.) Given the amended claim language, which requires two transport mechanisms, each with a lateral release mechanism, as well as the specification's statement that the transport mechanisms are on opposite sides of the roof, Defendants contend the only conclusion is that the lateral release mechanisms must be on opposite sides of the roof. (*Id.* at 39.) Defendants, however, have failed to meet the high standard required to show a prosecution disclaimer of the expressed embodiment. *See N. Am. Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335, 1345-46 (Fed. Cir.

2005).

The current claim phrasing resulted from "an examiner's amendment concurrent with the notice of allowance that changed 'a transport mechanism' to 'first and second transport mechanisms' and changed 'a lateral release system' to 'a lateral release system for each of said transport mechanism.'" (Pl. Mem. at 26.) Defendants assert that the examiner's notice of allowance stated that she was requiring the amendment to be made and that the claims were being allowed with these amendments because "the prior art . . . does not disclose a lateral release system comprising a linear slide bearing as set forth in the claims." (*See* Ex. HH, May 29, 2009 Notice of Allowance at 3.) Defendants also cite the examiner's note that "[a]uthorization for this examiner's amendment was given in a telephone interview with [the patentees]." (*See id.*) Defendants also note the examiner allowed the patentees to provide comments, but the patentees did not object to the examiner's amendment. (Def. Mem. at 40.)

Yet, the patentees made clear the examiner's amendments "were strictly in response to formal considerations as expressed to the [patentees by the examiner]" and "were not intended to define over prior art." (Ex. S, '4360 Patent File History, Aug. 20, 2009 Comments on Statement for Reasons for Allowance.) Although Defendants are correct that a prosecution

history disclaimer may apply where amendments are made for reasons other than defining over prior art, *see generally Biogen Idec, Inc. v. GlaxoSmithKline LLC*, 713 F.3d 1090 (Fed. Cir. 2013), the patentee's conduct here does not constitute disavowal of a preferred embodiment, as nothing in the statement of allowance indicated that the examiner allowed the claims because the prior art did not disclose lateral release mechanisms located on opposite sides of the roof, *see, e.g.*, *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1322 (Fed. Cir. 2012) (finding error in construction where only support for construction was a post-allowance examiner's amendment, which "alone [was] insufficient to create a waiver" of claim scope).

Furthermore, if any ambiguity remained as to the plain and ordinary meaning of the claim, Dr. Nair's testimony filled the gap. Dr. Nair credibly testified that a POSITA would understand "a lateral release system for each of said transport mechanism" to mean the system within the "said transport mechanism" that permits limited movement nonparallel to the supporting rail. (Nair Decl. ¶ 46.) As Dr. Nair explained, a POSITA would understand that placing a lateral release system on opposite ends of a roof would undermine the intent of the invention by undesirably leaving the supported roof panel

floating free. (*See id.* ¶ 47.)[15]

Accordingly, the court finds that "a lateral release system for each of said transport mechanism" should be given its plain and ordinary meaning.

2. "Interposed Between" (Claims 1, 14, and 21)

The term "interposed between" is recited in Claims 1, 14, and 21 of the '4360 Patent. In Claim 1, the term is included as follows:

> [A] lateral release system for each of said transport mechanism, **interposed between** said rail follower wheels and the large overhead structural member.

('4360 Patent at 06:07–09 (emphasis added).) In Claims 14 and 21, the term is included as follows:

> [A] lateral release system for each of said transport mechanism, **interposed between** said rail follower wheels and the movable roof panel.

(*Id.* at 07:01-03, 08:16-18 (emphasis added).)

Plaintiff argues that "interposed between" should be assigned its plain and ordinary meaning or, alternatively, should be construed as "placed in an intervening position."

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[15] In response to Plaintiff's argument that Defendants' construction would lead to an "undesirabl[e]" outcome (Pl. Mem. at 27), Defendants rely on *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1373-74 (Fed. Cir. 2004) to argue that the court cannot "redraft claims," even to avoid a "nonsensical result," (Def. Mem. at 41-42). *Chef America* rejected an attempt to "redraft" a claim that the Federal Circuit found to be "ordinary, simple English words whose meaning is clear and unquestionable." 358 F.3d at 1373. In this case, the court is not redrafting the claim, but giving it its ordinary meaning. If the requirement sought by Defendants were clearly stated by the ordinary meaning of the claim, then that ordinary meaning would control. But it was not.

(Pl. Mem. at 27-28.) Defendants argue that "interposed between" should be construed to mean "directly between, namely, placed directly above said rail follower wheels and directly below said large overhead structural member (claim 1) or movable roof panel (claims 14, 21) as exemplified in Figure 3." (Def. Mem. at 42.) The court agrees with Plaintiff and finds that no construction beyond plain and ordinary meaning is necessary.

Defendants argue the intrinsic evidence supports their proposed construction, citing to the specification, where the phrase "interposed between" is used twice in a consistent manner. (*See* '4360 Patent, 04:49–51 (reference to Figure 3 "shows that, from a top-to-bottom vertical order, the roof panel 20 is on top, followed by the lateral release system 29, followed by the rail follower wheels 40"); 05:13-15 (reference to Figure 4, showing an orientation between but also guide shaft 48 above and an guide shaft 46 below: "[b]earing sleeves 54, 55 are interposed between the guide shaft collar 48 and the guide shaft 46 at each end of the guide shaft collar 48").)

Plaintiff argues that Defendants' proposal conflicts with the plain and ordinary meaning of "interposed between," is inconsistent with the claim language, and excludes a preferred embodiment. (*See* Pl. Mem. at 28-30.) Plaintiff asserts that a POSITA would not understand that the term "interposed between" to mean "directly between," or "directly above or below" in the

context of the '4360 patent. (*See* Nair Decl. ¶ 48.) Rather, a POSITA would understand "interposed between" to mean placed between two components, "and configured to *mechanically* separate and be interposed between the components, consistent with the purpose and function of the lateral release system." (Pl. Mem. at 29.)

As noted above, it is well settled that "[w]ords used in a claim will normally be given their ordinary and accustomed meaning unless it appears that the inventor intended to use the word differently." *Lucas Aerospace, Ltd. v. Unison Indus., L.P.*, 890 F. Supp. 329, 339 (D. Del. 1995) (holding that "interposed between" must be interpreted consistent with its plain meaning and was a locational term).

Nothing in evidence overcomes the "heavy presumption," *CCS Fitness*, 288 F.3d at 1366, that "interposed between" should carry its ordinary and customary meaning. The plain and ordinary meaning of the term "interposed between" is regularly construed as: "located between," *Bad Boy, Inc. v. Spartan Mowers LLC*, No. 16-CV-114, 2018 WL 659864, at *4 (E.D. Ark. Feb. 1, 2018); "introduced or placed between," *Medtronic Vascular Inc. v. Abbott Cardiovascular Sys., Inc.*, 614 F. Supp. 2d 1006, 1015 (N.D. Cal. 2009); "placed between," *Pioneer Corp. v. Samsung SKI Co.*, No. 07-CV-170, 2008 WL 4831319, at *8 (E.D. Tex. Mar. 10, 2008); and "to place in an intervening position," *Mid-America*

Bldg. Prods. Corp. v. Richwood Bldg. Prods., Inc., 978 F. Supp. 708, 711 (E.D. Mich. 1996) (quoting the Merriam Webster's Collegiate Dictionary (10th ed.1995) definition of "interpose").

Defendants argue that a review of the specification reveals an intent on the patentee's part to depart from the plain and ordinary meaning and add an additional limitation relating to the vertical stacking order of the various components. Defendants indicate that the phrase "interposed between" appears twice in the patent. The first use of interposed between appears in the specification's statement that "[l]ateral release system 29 is structurally interposed between the rail follower wheels 40 and the movable roof panel 20, as is clearly shown in Figure 3." ('4360 Patent at 04:49-51.) Figure 3 appears in the patent as follows:

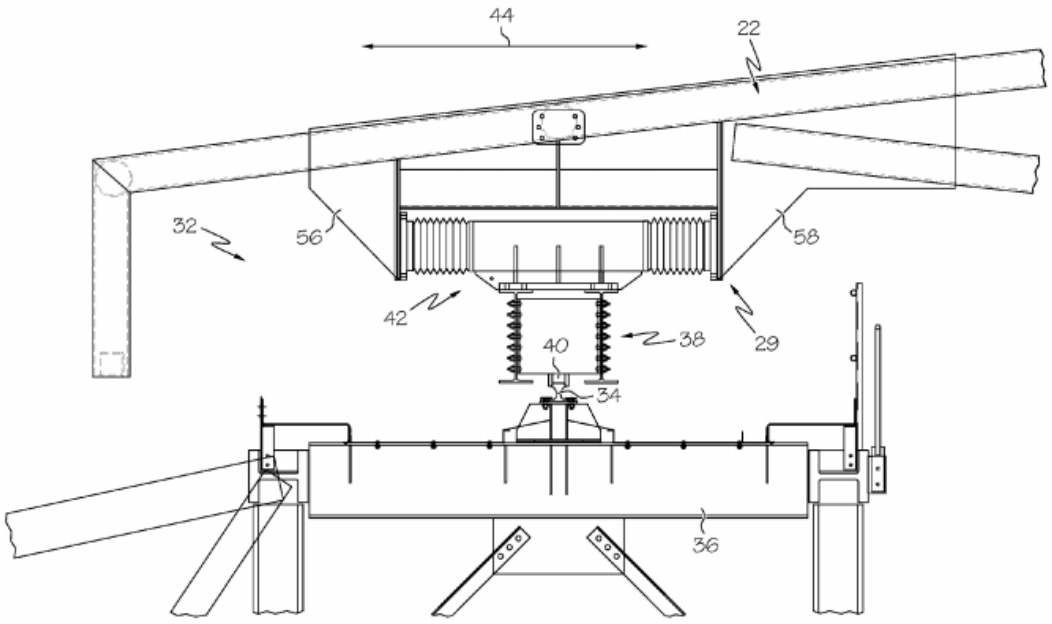


FIG. 3

(*Id.* Fig. 3.) Although Figure 3 shows the lateral release system interposed between the wheels and roof, it does not show whether the lateral release system is *directly* above the wheels, as would be required by Defendants' proposed construction.

The term "interposed between" also appears in the portion of the specification describing Figure 4, which states that "[b]earing sleeves 54, 55 are interposed between the guide shaft collar 48 and the guide shaft 46 at each end of the guide shaft collar 48." Figure 4 appears as follows:

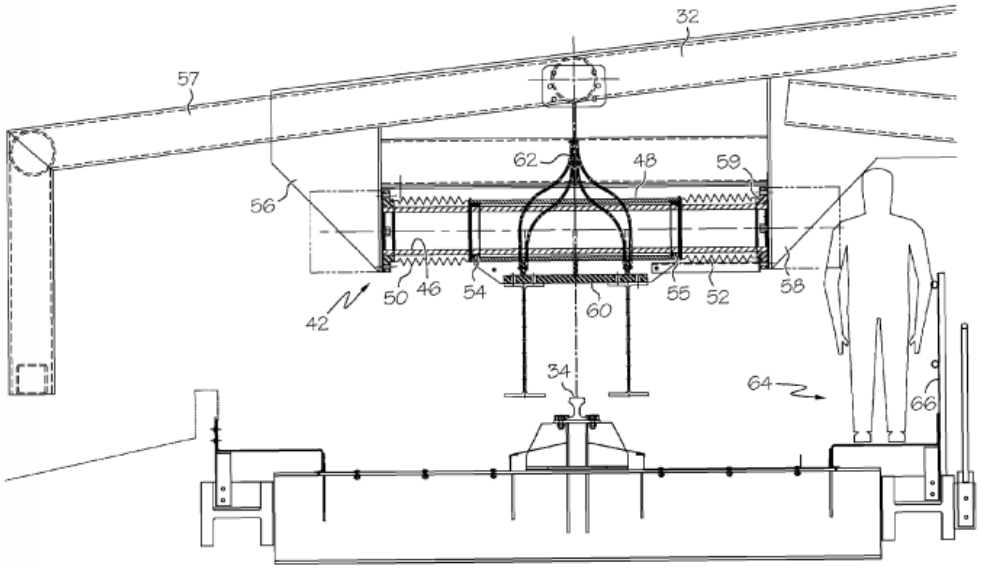


FIG. 4

('4360 Patent, Fig. 4.) Defendants also rely on this figure in arguing that "interposed between" requires a sort of vertical ordering. (Def. Mem. at 44.) Defendants' argument, however, relies on a misunderstanding of the nature of the drawing – it refers to a side view of the linear bearing, and ignores the

fact that the bearing sleeves, guide shaft collar, and guide shaft are concentric cylinders. (*See* Pl. Supp. Mem. at 44.) Placed in the proper perspective, it is clear that the bearing sleeve is not in a "separate plane" from the outer guide shaft collar and inner guide shaft, nor is it located directly above or below either component. (*Id.* (providing illustration).) Consequently, Defendants' proposed construction contradicts the claim specification. *See ERBE Elektromedizin GmbH v. Int'l Trade Comm'n*, 566 F.3d 1028, 1034 (Fed. Cir. 2009) ("We generally do not construe claim language to be inconsistent with the clear language of the specification; 'usually, it is dispositive.'") (quoting *Phillips*, 415 F.3d at 1315) (alteration omitted).

Even if the court were to read Figures 3 and 4 as Defendants suggest, it would not change the outcome of this analysis. Both figures could, at most, be *consistent* with Defendants' proposed construction. But the figures are both also consistent with the plain and ordinary meaning, which captures the relative positioning of the components illustrated in both Figures 3 and 4, and there is no evidence of intent on the patentee's part to abandon the phrase's plain and ordinary meaning.

Defendants further argue that Plaintiff disclaimed the plain and ordinary meaning during prosecution. The original

patent application defined the lateral release element as:

> [A] lateral release system for maintaining the transport mechanism in a predetermined orientation while simultaneously permitted a limited amount of movement of the large overhead structural member . . . .

(Ex. 13, Mar. 3, 2006 Application, at 10.) During review, an examiner rejected Claims 1, 14, and 21 of the '3460 Patent in view of another lateral release system described in prior art, U.S. Patent No. 6,851,227 (Schlidge). (Ex. Y, Oct. 6, 2008 Office Action, at 4.) The examiner explained that Schlidge used a transport mechanism comprising a single trolley rail with no additional rail, a plurality of rail follower wheels, and a lateral release system. (*Id.* at 4-5.) In response to the examiner raising Schlidge's lateral release system as prior art, the patentees amended the specification and claims to add the following limitation:

> [A] lateral release system, interposed between said rail follower wheels and the movable roof panel, for maintaining the transport mechanism . . . .

(Ex. GG, Mar. 10, 2009 Amendment at 4, 6, 7.)

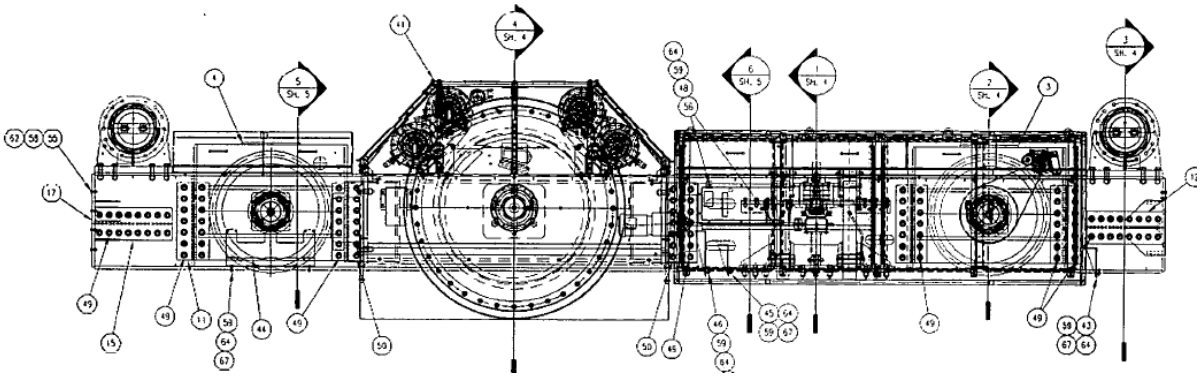
This amendment, however, will not bear the freight Defendants attempt to foist upon it. The patentees differentiated the '4360 patent from the Schildge prior art on the grounds that in Schlidge, the lateral release mechanism was located *below* both the rail follower wheels *and* the movable roof panel, in contrast to the '4360's positioning of the lateral

release mechanism *between* the rail follower wheels and the movable roof panel. (*Id.* at 9-10.)

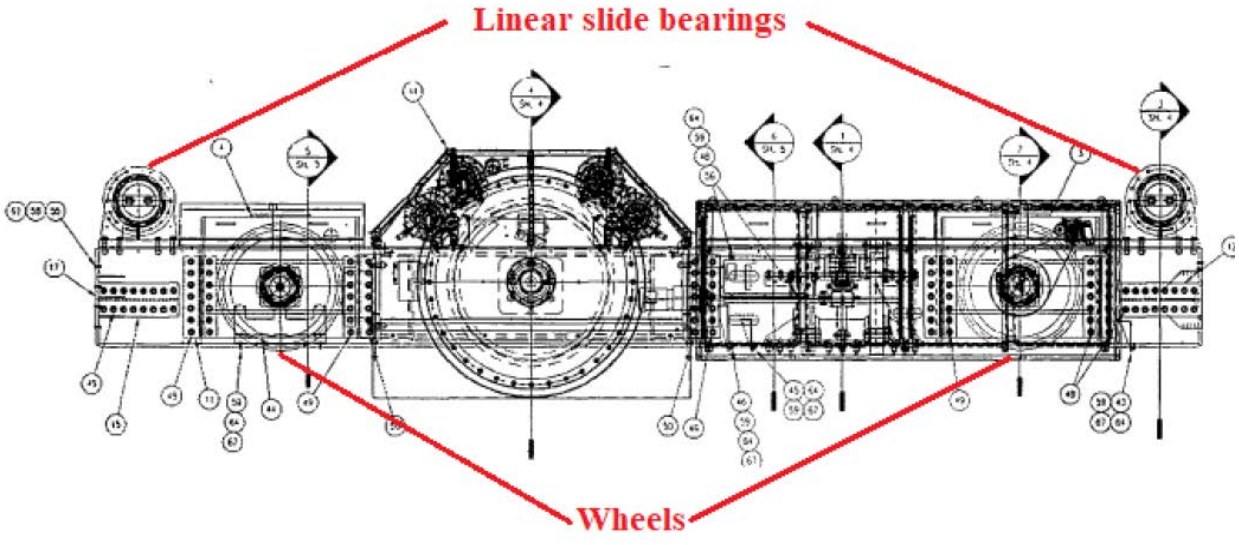
Defendants further cite to Plaintiff's statements that "[w]ithout the lateral release system that is between the rail follower wheels and the moveable roof panel, the alignment of the system could be badly compromised" (*id.* at 10), to support their argument that the patentees clarified that the vertical orientation of the elements was key (Def. Mem. at 46). Defendants read too much into Plaintiff's statements. It is not technically incorrect to argue that Plaintiff distinguished its system from Schlidge's based on the order of the components in some way. But in distinguishing Schlidge, Plaintiff did not clearly state that the elements must be directly above one another, in separate vertical planes. Plaintiff instead focused on the fact that Schildge placed the lateral release mechanism *below* the rails and the roof panel, while Plaintiff placed the lateral release mechanism *between* the rails and the roof panel, without further refining "between." The prosecution history demonstrates no attempt by Uni-Systems to limit the term "interposed between" to require positioning of the lateral release system "directly above or below" or "vertically oriented between two parallel planes."

Finally, Defendants' proposed construction would also exclude an embodiment noted in the provisional patent, which

Plaintiff claims constitutes a preferred embodiment. As noted above, the '848 Provisional is incorporated by reference into the '4360 Patent and contains blueprints of the Arizona Cardinals' stadium roof:



(Ex. T, '848 Provisional at 66.) In the above embodiment, the linear slide bearings are not directly above the rail follower wheels (as Defendants' construction would require):



(Pl. Mem. at 30.)

As the Federal Circuit has explained, "a claim interpretation

that excludes a preferred embodiment from scope of the claim is rarely, if ever, correct." *Accent Packaging*, 707 F.3d at 1326. And even if Defendants' interpretation could be consistent with the above figure (which does not appear to be the case), more would be needed to show disavowal of the plain and ordinary meaning of the phrase.

Defendants argue the figure in the '848 Provisional does not constitute a preferred embodiment and that, even if it did, the claim is overcome by amendment, and Defendants cite cases supporting the proposition that amendments could overcome a preferred embodiment. (Def. Mem. at 40-41.) Those cases, however, do not support a finding that Defendants' proposed construction is proper, as they turned on an *applicant's* (not an examiner's) amendment to the claim to overcome prior art. *See Elekta Instrument S.A. v. O.U.R. Sci. Int'l, Inc.*, 214 F.3d 1302, 1308 (Fed. Cir. 2000) (applicant amended the claim to overcome prior art); *N. Am. Container*, 415 F.3d at 1345-46 (same). Silence by the patentees in response to the examiner's statements for allowance, in this context, cannot constitute a disavowal of a prior embodiment. *See Biogen Idec*, 713 F.3d at 1095, 1097 n.6 (only "a clear and unmistakable disavowal during prosecution overcomes the heavy presumption that claim terms carry their full ordinary and customary meaning") (quotations omitted).

Consequently, the court finds that "interposed between" should be given its plain and ordinary meaning.

3. Alleged Indefinite Terms: "Stable Movement," "Limited Amount of Movement," "Very Small Side Load," and "No Need for Additional Lateral Reinforcement"

Defendants challenge four terms in the '4360 Patent as indefinite: "stable movement"; "limited amount of movement"; "very small side load"; and "no need for additional lateral reinforcement." The definiteness requirement of 35 U.S.C. § 112(b) requires "that a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). Because patents are presumed to be valid, a party asserting indefiniteness must prove its case by clear and convincing evidence. *See Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 95 (2011).

"Claim language employing terms of degree has long been found definite where it provided enough certainty to one of skill in the art when read in the context of the invention." *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1378 (Fed. Cir. 2015) (quoting *Interval Licensing LLC v. AOL, Inc.*, 766 F3.d 1364, 1370 (Fed. Cir. 2014)). "Although absolute or mathematical precision is not required, it is not enough, as some of the . . . prior cases may have suggested, to identify

'*some standard* for measuring the scope of the phrase.'" *Id.* at 1381 (emphasis in original). "The claims, when read in light of the specification and the prosecution history, must provide objective boundaries for those of skill in the art." *Interval Licensing*, 766 F.3d at 1371.

Having reviewed the principles governing definiteness, particularly with respect to claim language employing terms of degree, the court will address each of the allegedly indefinite claim terms and phrases in turn.

i. **"Stable Movement" (Claim 1)**

The term "stable movement" appears in the preamble of Claim 1. Plaintiff asserts that, in the context of the patent, the term "stable movement" is not limiting, and need not be construed. (Pl. Mem. at 21.) Defendants contend that the term is limiting and that the term is indefinite. (Def. Mem. at 27-28.) The court agrees with Plaintiff that "stable movement" is not limiting and need not be construed.

Whether the preamble constitutes a limitation is determined "on review of the entire patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim." *Georgetown Rail Equipment Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017) (quoting *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (alteration omitted)).

"Generally, the preamble does not limit the claims." *Id.* (quoting *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002)). A preamble may be limiting, however, if it:

> "recites essential structure or steps"; claims "depend[] on a particular disputed preamble phrase for antecedent basis"; the preamble "is essential to understand limitations or terms in the claim body"; the preamble "recit[es] additional structure or steps underscored as important by the specification"; or there was "clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art."

Georgetown Rail, 867 F.3d at 1236 (quoting *Catalina Mktg.*, 289 F.3d at 808). "Conversely, a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention." *Catalina Mktg.*, 289 F.3d at 808 (quotation omitted).

The statement of intended use here – "for stable movement" – is not limiting. The term "stable movement" appears only in the preamble and is not repeated in the body of Claim 1. (*See* '4360 Patent at 05:62–06:17.) No portion of the claim turns on the reference to "stable movement" in the preamble for antecedent basis. Nor does "stable movement" recite a non-limiting purpose or intended use. The body of Claim 1 defines a structurally complete convention, without reference to the term stable movement.

Defendants argue that the term is not merely an explanatory reference to an unclaimed purpose, *see Unwired Planet LLC v. Google Inc.*, No. 12-CV-504, 2015 WL 3378476, at *3-4 (D. Nev. May 26, 2015), *aff'd in part*, 660 F. App'x 974 (Fed. Cir. 2016), but provides mandatory characteristics of the claimed system and context for the remainder of the claim (Def. Mem. at 28).[16] Defendants cite to portions of the specifications indicating that a purpose of this invention is to create a system which can "move the roof in a stable way." (Hr'g Tr. at 405:02-04.) But Defendants do not show that the term "stable movement" is necessary to understand Claim 1, given that it otherwise states a complete invention.

Defendants further argue that it is wrong to focus on the reference to "stable movement" in the preamble, to the exclusion of the remainder of its terms. (Def. Mem. at 29.) Defendants cite *Koninklijke KPN N.V. v. Samsumg Elecs. Co., Ltd.*, Nos. 14-CV-1165, 15-CV-948, 2016 WL 2610649, at *32 (E.D. Tex. May 6, 2016), which held that the court should not parse out the preamble into limiting and non-limiting language, as the language was too intertwined. Here, by contrast, even if certain terms are necessary to provide an antecedent basis (*see,*

[16] Defendants cite *Cardiac Pacemakers*, 296 F.3d 1106, which held that "[t]he words 'for' here generally signal claimed function." But *Cardiac Pacemakers* is not an apt analogue. There, the "for" limitation appeared in the *body* of the claim, not just the preamble. *See Cardiac Pacemakers*, 296 F.3d at 1108, 1114.

e.g., "large overhead structural member" and "underlying structure"), "stable movement" can be parsed out as a non-limiting term, and it is not necessary to construe the entire preamble. *See TomTom, Inc. v. Adolph*, 790 F.3d 1315, 1323 (Fed. Cir. 2015) ("That [a] phrase in the preamble . . . provides a necessary structure for [the] claim . . . does not necessarily convert the entire preamble into a limitation, particularly one that only states the intended use of the invention."). That the claim itself references the structural terms but *not* "stable movement" bolsters this conclusion.

Defendants also argue that the term is limiting because Uni-Systems "relied on this purpose [during prosecution of the '4360 Patent] to overcome a rejection." (Def. Mem. at 29.) Defendants cite to the March 9, 2009 Amendment to the patent, which states that the "Applicant has not invented a bearing per se, it has invented a system for supporting a large overhead structural member that incorporate a conventional slide bearing with commercially available specifications." (Ex. 8, at 9.) But this statement addresses a Section 112 rejection, not a prior art rejection, and does not even reference the term "stable movement." So while "statements of intended use or asserted benefits in the preamble may, in rare instances, limit apparatus claims," this occurs "only if," unlike here, "the applicant clearly and unmistakably relied on those uses or

benefits to distinguish prior art." *Catalina Mktg.*, 289 F.3d at 809.

Therefore, the court finds that "stable movement" is not a limiting claim and need not be construed.

ii. **"Limited Amount of Movement" (Claims 1, 14, & 21)**

The term "limited amount of movement" appears in Claim 1 and is used to describe the movement of a large overhead structural member:

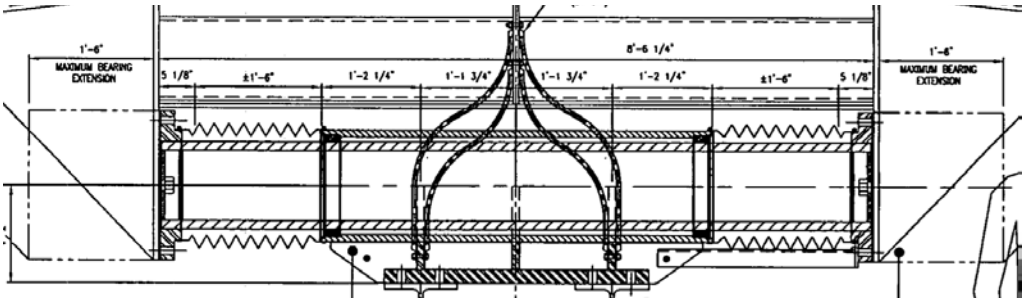
> [A] lateral release system for each of said transport mechanism, . . . for maintaining the transport mechanism in a predetermined orientation while simultaneously permitting a **limited amount of movement** of the large overhead structural member in a direction that is nonparallel to said predetermined path.

('4360 Patent at 06:07–13 (emphasis added).) Plaintiff argues "limited amount of movement" does not require construction and should be assigned its plain and ordinary meaning. (Pl. Mem. at 30-31.) Defendants argue that the phrase is indefinite, on the ground that the '4360 Patent and its application history contain no information that would provide anyone, including a POSITA, with any understanding of what a "limited" amount of movement would be in context. (Def. Mem. at 47-48.) The court agrees with Plaintiff and finds that the phrase need not be construed beyond plain and ordinary meaning. The word "limited" does not render the phrase "limited amount of movement" indefinite, as the meaning of the phrase and the use of the word "limited" is

clear to a POSITA when read in the context of the instant invention.

As the parties agree, Claim 1 describes the kind of movement at issue, namely, the "movement of the large overhead structural member in a direction that is nonparallel to [a] predetermined path." ('4360 Patent at 06:12-13.) Defendants, however, take issue with the lack of specific parameters guiding a reader as to how they should quantify an "amount" of movement, in determining whether that movement is actually "limited." (Def. Mem. at 48.) Although the claim and specification do not provide specific standards for measuring "limited" movement, a POSITA would understand from the patent the scope of movement sufficient to accommodate the variations identified in the '4360 Patent.

Indeed, a reader seeking guidance on the parameters of "limited amount of movement" could look to the '848 Provisional:



('848 Provisional at 71.) An illustration included therein, excerpted above, shows a "maximum bearing extension" of 1'6" on either side of the mechanism. (*Id.*) As Dr. Nair testified, a

POSITA would understand that the "maximum bearing extension" of 1'6" noted in the illustration in the '848 Provisional provides an example of the "metes and bounds" of limited movement within the meaning of the patent. (*See* Nair Decl. ¶¶ 49-50.)

Defendants are correct that the schematic drawing comes from the design for the Arizona Cardinals' stadium and the exact dimensions may not apply in every case. (Def. Mem. at 50.) As Dr. Nair testified, if two identical stadiums were built – one in Milwaukee and one in Miami – what constitutes "limited movement" would be different, as the stadia would have to account for different climates (e.g., hurricane frequency, temperature variation, snow). (Hr'g Tr. at 163:23-164:03.) Yet, the evidence provides guidance as to both the type of movement at issue which would need to be accommodated by the system, and provides an example of the boundaries of said movement in the context of at least one embodiment, providing "reasonable certainty" to a POSITA as to the meaning of limited in this context. *See Nautilus*, 572 U.S. at 901.

Plaintiff also cites to several cases in which courts rejected arguments that the term "limited" was indefinite. *See, e.g., Qcue, Inc. v. Digonex Techs., Inc.*, No. 12-CA-484, 2013 WL 4784120, at *3 (W.D. Tex. Sept. 5, 2013), *aff'd*, 575 F. App'x 895 (Fed. Cir. 2014) (no construction of "limited quantity"). Defendants attempt to distinguish these cases, but their efforts

are unavailing, as the specification and intrinsic evidence provides sufficient information for a POSITA to determine the scope of the claim. *See, e.g.*, *Sonix Tech. Co. v. Publications Int'l, Ltd.*, 844 F.3d 1370, 1378 (Fed. Cir. 2017).

As a result, the court finds that "limited amount of movement" should be given its plain and ordinary meaning.

iii. **"Very Small Side Load" (Claims 1, 14, & 21)**

The term "very small side load" appears in Claims 1, 14, and 21 as follows:

> [A] lateral release system for each of said transport mechanism . . . wherein said system transmits a **very small side load** to said single trolley rail with no need for additional lateral reinforcement.

('4360 Patent at 06:07-16; 07:01-09; 08:16-25 (emphasis added).) Plaintiff argues that "very small side load" should be interpreted in accordance with it plain and ordinary meaning, which Plaintiff asserts is "side load that is a small fraction (e.g., 20%) of the vertical load." (Pl. Mem. at 34.) Defendants argue Plaintiff's proffered definition is "far from 'plain and ordinary,'" and that "very small side load" is indefinite. (Def. Mem. at 51-53.)

Defendants argue that a POSITA would be unable to understand the meaning of the phrase "very small side load" using the available intrinsic and extrinsic evidence, thereby rendering the phrase indefinite. Defendants base their argument

on the principle that when claims employ words of degree, courts must look to the specification to determine if it provides a standard to measure the degree in order to avoid indefiniteness. *See Seattle Box Co., Inc. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984). According to defendant, the specification only references the phrase once without defining it, and the prosecution history only adds to the ambiguity of the term, by failing to add any objective measure of the term. (*See* Lack Decl. ¶ 83.)

Defendants are correct that where a claim uses words of degree, the court should consider whether the specification "provides some standard for measuring that degree." *Seattle Box Co.*, 731 F.2d at 826.[17] Defendants note the specification

[17] Plaintiff begins by pointing to a number of distinguishable cases and patents that found the use of "small" or "very small" not indefinite. Plaintiff cites a handful of cases where courts found that use of the relative term "small" did not qualify as indefinite, but those cases involved instances where the patents provided more specific intrinsic guidance as to the boundaries of "small" or "very small." *See, e.g.*, *EcoServices, LLC v. Certified Aviation Servs., LLC*, No. 16-CV-1824, 2017 WL 2783486, at *3 (C.D. Cal. May 18, 2017) ("[W]hen the entire claim itself is read, 'small quantities' is further defined as 'an overpressure within the range of 50–80 bars and at a liquid particle size in the range of 250–120 µm, and with a total volumetric flow through the nozzle or nozzles within the range of 0.5–60 l/min., and with a liquid particle velocity of 100–126 m/sec.'"); *Godo Kaisha IP Bridge 1 v. Broadcom Ltd.*, No. 16-CV-134, 2016 WL 6611490, at *19-20 (E.D. Tex. Nov. 9, 2016) ("What is clear, however, is that the term 'small dielectric constant' in the context of the '980 Patent refers to a dielectric constant not greater than that of silicon dioxide."). Plaintiff also cites patents which used the relative term "very small," but did not cite portions of those patents using "very small" in the claim itself, but rather in other portions of the patent. (*See, e.g.*, Ex. V, U.S. Patent No. 5,035,093, at 05:13-16 (using "very small" in specification); Ex. W, U.S. Patent No. 6,003,269, at 01:07-09 (using "very small" in background); Ex. X, U.S. Patent No. 4,581,860, at 02:02-06, 02:30-32).)

mentions "very small side load" only once and, in doing so, does not provide a specific meaning for the term. (*See* '4360 Patent at 05:46-51 ("This system is unique because it reduces the ratio of horizontal friction to vertical gravity, thus transmitting a very small side-load to the wheels an bearings for the main load supporting wheels on the main rails.").)

Plaintiff's response to this argument points to the '848 Provisional, which Plaintiff states presents results from a bearing friction test of the lateral release system. (Pl. Mem. at 35-36.) The following table shows the test results:

TEST #	VERTICAL PRESS. (PSI)	VERTICAL LOAD (KIPS)	STATIC HORIZ. PRESS. (PSI)	STATIC LOAD (KIPS)	STATIC COEF. FRICT.
1	500	20.6	600	2.8	14%
2	1000	41.3	1600	7.6	18%
3	1500	61.9	2600	12.3	20%
4	2050	84.6	3600	17.0	20%
5	2500	103.2	4200	19.8	19%
6	3000	123.8	4900	23.1	19%
6.5	3500	144.4	5900	27.8	19%
7	4000	165.0	7300	34.5	21%
8	4500	185.7	7900	37.3	20%
9	5050	208.4	9300	43.9	21%
11	3500	144.4	6000	28.3	20%
12	3100	127.9	5200	24.5	19%
13	3100	127.9	6000	28.3	22%
14	2700	111.4	1750	8.3	7%
15	2700	111.4	1900	9.0	8%
16	3000	123.8	900	4.2	3%
17	3000	123.8	1100	5.2	4%
18	3000	123.8	1800	8.5	7%
19	3000	123.8	1900	9.0	7%
20	3000	123.8	2000	9.4	8%
21	3500	144.4	500	2.4	2%
21.5	3500	144.4	600	2.8	2%
22	3500	144.4	1200	5.7	4%
22.5	3500	144.4	1400	6.6	5%
23	3500	144.4	1800	8.5	6%
24	3500	144.4	2300	10.9	8%
25	3500	144.4	2700	12.7	9%
26	3500	144.4	3300	15.6	11%
27	3500	144.4	3300	15.6	11%
28	3500	144.4	3000	14.2	10%
29	3500	144.4	1600	7.6	5%
30	3500	144.4	1750	8.3	6%
31	3500	144.4	1800	8.5	6%
32	3500	144.4	1900	9.0	6%
33	6000	247.6	1500	7.1	3%
34	6000	247.6	2100	9.9	4%
35	6000	247.6	2300	10.9	4%
36	6000	247.6	2600	12.3	5%
37	6000	247.6	3000	14.2	6%

('848 Provisional at 51.) Dr. Nair described this table as reflecting "results of tests of the release mechanism in which predetermined vertical loads are applied on the system and, for

each vertical load, the horizontal load required to initiate sliding ('static' load) is measured." (Nair Decl. ¶ 52.)[18] In other words, in the test, once the vertical force was applied, a horizontal force was applied until lateral movement of the system began. (*See id.*) Per Dr. Nair, when a vertical load is applied, a friction force is generated between the bearing components of the lateral release system, and the "static load" noted above is the horizontal load that overcomes the friction and causes sliding to begin. (*Id.*) Plaintiff alleges a POSITA would understand from these figures that the side load is "very small" compared to the vertical load. (*Id.* ¶ 53.)[19]

Defendants, however, raise valid objections to the notion that the above results define the scope of "very small side load." Defendants note that in the '848 Provisional, the

[18] Defendants assert that Dr. Nair is not an expert in retractable-roof *mechanization*. (Def. Mem. at 54 n.17 (citing (Lack Decl. ¶ 11).) Dr. Nair submitted a supplemental declaration in response showing his experience with movable roof structures, and that he met, and exceeded, the qualifications necessary to qualify as a POSITA under Defendants' definition. (Nair Supp. Decl. ¶¶ 3-5.)

[19] Plaintiff also argues that "the file history also confirms that the term 'very small side load' is not indefinite" because "[a]t no time did the examiner reject claims 1, 14, and 21" as indefinite "based on the bounds of 'very small side load.'" (Pl. Mem. at 37.) If Plaintiff were correct, no approved patent term would be found to be indefinite. Plaintiff further argues that during the October 6, 2008 Office Action, the examiner identified prior art which included claim language referencing a "very small side load," and argues that the examiner's discussion "exemplifies a clear understanding of this term." (*Id.* (citing '4360 Patent File History, Oct. 6, 2008 Office Action, at 4-6, 13).) However, the examiner's comments did not appear focused on the issue of "very small side load" and, again, the absence of an objection cannot as a rule be construed as meaning there was no indefiniteness issue.

patentee declared that the invention is "unique because it produces the ratio of horizontal friction to vertical gravity of 0.1 or less, thus transmitting a very small side-load to the wheels and bearings for the main load supporting wheels on the main rails." ('848 Provisional at 6-7.) Said ratio, however, did not appear in an almost identical statement in the patent itself. (*See* Def. Mem. at 52; '4360 Patent at 05:46-51.) Defendants also note that the patentees, in distinguishing Doi, stated that Doi generated a "large and significant side load between the transport mechanism in the underlying structure." (Ex. 15, June 23, 2008 Amendment, at 8.) Defendants state that Plaintiff added "very small side load" to distinguish its invention from Doi, but did not provide specific calculations (or horizontal or vertical loads, coefficients of friction, etc.) corresponding to Doi's side load. (*See* Def. Mem. at 52.)

More to the point, although Plaintiff argues its plain and ordinary definition is supported by Appendix C to the '848 Application, based on a prototype friction test, the '848 application cites a wide range of results for the test based on modifying different factors. (*See* '848 Application at 22 of 80.) The test results for the test noted above alone span from two percent to 22 percent, and Plaintiff provides no basis for why it selected 20 percent as the definition for "very small." Similarly, the combination of duralon and hard chrome, employed

to generate the above results, was not noted in the specification. (*Compare* '4360 Patent at 05:01-20 (explaining that the bearing sleeves are "preferably fabricated from" duralon and the cylindrical guide shaft is "finished with an electroless nickel plating").)

The court further agrees that the presence of dependent claims providing for frictional ratios of 20 percent, 15 percent, and 10 percent (*see* '4360 Patent at 06:22-30) contradicts Plaintiff's proposed definition of the "plain and ordinary meaning." Plaintiff argues that a POSITA would understand a "very small side load" to be "a side load that is a small fraction (e.g., 20%) of the vertical load." (Pl. Mem. at 34.) Plaintiff has, on more than one occasion, argued correctly that reading a limitation from a dependent claim into an independent claim is not appropriate, particularly where the only difference between the two is the additional limitation set forth in the dependent claim. As a dependent claim here sets forth a frictional ratio of 20 percent or less, that would suggest the independent claim is broader, and that the meaning of "very small side load" within the independent claim itself must also be broader.

Accordingly, "very small side load" is indefinite.

iv. **"No Need for Additional Lateral Reinforcement" (Claims 1, 14, & 21)**

The term "no need for additional lateral reinforcement" appears in Claims 1, 14, and 21 as follows:

> [W]herein said [lateral release] system transmits a very small side load to said single trolley rail with **no need for additional lateral reinforcement**.

('4360 Patent at 06:14-16; 07:07-09; 08:23-25 (emphasis added).) Plaintiff argues the meaning of the phrase is "clear and unambiguous from [its] simple and straightforward words," and should be construed in accordance with its plain and ordinary meaning. (Pl. Mem. at 37.) Defendant argues the proper construction of the phrase is "no additional lateral reinforcement." (Def. Mem. at 56-57.) The court agrees with Plaintiff that no construction is necessary beyond plain and ordinary meaning.

The meaning of "no need for additional lateral reinforcement" is clear from the claim's language. The disputed phrase, in context, provides that the lateral release system does not need additional lateral enforcement to transmit a very small side load. This is an improvement on the prior art, which *required* a four bar linkage system. (*See* '4360 Patent at 2:37-39; *see also* Nair Decl. ¶ 55 (citing '9360 patent, Figure 10).) Had the patentees intended for their invention to require *no* additional reinforcement, they could have said so, as they did

in clarifying that the invention involved *no* additional rail. *See Innova*, 381 F.3d at 1119 ("[W]hen an applicant uses different terms in a claim, it is permissible to infer that he intended his choice of different terms to reflect a differentiation in the meaning of those terms."). Instead, they simply stated there was "no need" for additional reinforcement.

Adopting Defendants' proposed construction would unduly limit the scope of this term. A court must "give meaning to all the words in [a] claimed term." *Exxon Chem. Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1557 (Fed. Cir. 1995). By changing the "lack of a need" for additional support into a definitive requirement that no additional reinforcement is present, Defendants unduly narrow the meaning of the term. It is not appropriate to improperly read words out of a claim, *see Apple Inc. v. Motorola Inc.*, 757 F.3d 1286, 1305 (Fed. Cir. 2014) ("proposed construction contradicts the claim language because it reads 'analyzer server' out of the claim"), *overruled on other grounds by Williamson*, 792 F.3d 1339, and "claims are interpreted with an eye toward giving effect to all terms in the claim," *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006).

The prosecution history also shows that "no need" should not be read out of the claim. In their representations during prosecution, the patentees on more than one occasion

specified that one of the benefits of their invention is that no additional reinforcement *is needed*. (June 23, 2008 Amendment (examples include "no lateral reinforcement or additional trolley rails are necessary," "no additional lateral reinforcement is needed," and "no need for additional lateral reinforcement").) Their representations are consistent with the plain meaning of the term, and do not suggest that reinforcement must be absent.

Defendants, nevertheless, attempt to rely on the prosecution history to establish their proposed construction. (Def. Mem. at 56.) The examiner initially rejected Claims 1 and 21 (among others) as being "anticipated by Doi (US Patent 5,896,708)," which, like the '4360 Patent, discloses "a system for supporting a large overhead structural member for stable movement with respect to an underlying structure." (Ex. U, '4360 Patent File History, Feb. 22, 2008 Office Action (citing Doi (US Patent 5,896,708)).) The invention claimed in Doi provides lateral infringement using two side rails to support its lateral release mechanism. (*See id.*) In response to the objection, the patentees amended each independent claim in the '4360 Patent to include the limitation, "said system transmits a very small side load to said single trolley rail with no need for additional lateral reinforcement." (June 23, 2008 Amendment at 3-6.) Defendants argue that, in context, the patentees'

amendment must be construed as providing for no additional rail, because they expressly distinguished Doi, which required additional rail. (Def. Mem. at 57.) This overreaches and conflates two distinct limitations – the patentees distinguished Doi by indicating that their invention did *not need* additional reinforcement, not by indicating that it excluded iterations with additional reinforcement.

Defendants inject a further dispute by questioning whether "no need for additional lateral reinforcement" modifies "a lateral release system," not "said single trolley rail." (Def. Supp. Mem. at 47-48.) Defendants argue this construction is confirmed by Mr. Lack, who opined that a POSITA would read and understand this claim language to find that the "additional lateral reinforcement" refers to the lateral release system, not the rail. (Tr. at 243:20-245:01.) Defendants again cite to the patentees' response to the Doi objection. (Def. Supp. Mem. at 48-49.)

Defendants further assert that, if Uni-Systems is correct that "no need" should remain in the claim, the term is indefinite because it does not specify when additional reinforcement would be necessary. (Def. Supp. Mem. at 48-49.) This is a red herring. The patentees did not add this term to indicate that additional reinforcement may or may not be necessary, depending on the situation. Rather, they simply

indicated that their invention did not require additional reinforcement. To the extent disputes arise, a POSITA, knowing the magnitude of the side load transmitted to the rail by the lateral release system, could determine if additional lateral reinforcement is necessary. (*See* Nair. Supp. Decl. ¶ 42.)

Consequently, "no need for additional lateral reinforcement" should be given its plain and ordinary meaning.

Conclusion

For the reasons set forth above, the court construes the disputed claim terms as stated in the following chart:

Term	Adopted Construction
tied arch	an arch in which the ends are connected with a connecting member
to assume most gravity induced stress	plain and ordinary meaning
retention mechanism	plain and ordinary meaning
retention element	wheels or their structural equivalents
preventing said roof member from being lifted upwardly . . . in the event of initiation of upward vertical movement	plain and ordinary meaning

a lateral release system for each of said transport mechanism	plain and ordinary meaning
interposed between	plain and ordinary meaning
stable movement	not a limiting term
limited amount of movement	plain and ordinary meaning
very small side load	indefinite
no need for additional lateral reinforcement	plain and ordinary meaning

SO ORDERED.

Dated: July 13, 2020
Brooklyn, New York

/s/
Hon. Kiyo A. Matsumoto
United States District Judge