

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

SUNPOWER CORPORATION,	:	
	:	
Plaintiff,	:	
	:	
v.	:	C. A. No. 12-1633-MPT
	:	
PANELCLAW, INC.,	:	
	:	
Defendant.	:	

MEMORANDUM ORDER

I. INTRODUCTION

This is a patent case. On December 3, 2012, SunPower Corporation (“SunPower” or “plaintiff”) filed suit alleging PanelClaw, Inc. (“PanelClaw” or “defendant”) infringes U.S. Patent Nos. 5,505,788 (“the ‘788 patent”) and RE38,988 (“the ‘988 patent”).¹ SunPower amended its complaint on January 24, 2013, and again on April 15, 2013.² PanelClaw filed its answer and counterclaims to the Second Amended Complaint on May 29, 2013.³ A *Markman* hearing was held on June 3, 2016. This Memorandum Order sets forth the court’s construction of the disputed terms of the ‘988 patent.⁴

The ‘988 patent, titled “Lightweight, Self-Ballasting Photovoltaic Roofing

¹ D.I. 1.

² D.I. 5 (First Amended Complaint); D.I. 16 (Second Amended Complaint).

³ D.I. 18.

⁴ The court previously issued a summary judgment Memorandum and Order finding non-infringement of the ‘788 patent. D.I. 88. Subsequently, plaintiff filed a Motion for Clarification and Reconsideration of the Court’s April 1, 2016 Memorandum and Order. D.I. 92. The court recently ruled on that motion. D.I. 137.

Assembly,” is a re-issue of U.S. Patent No. 5,746,839 that issued in 1998. The ‘988 patent was filed in 2003, issued in 2006, and expired in early 2016. The invention “generally relates to a photovoltaic roofing assembly, and in particular to a lightweight photovoltaic roofing assembly requiring no roofing penetrations and which resists wind up-lift due to specialized component geometry and by acting as an integral assembly.”⁵

The Abstract of the ‘988 patent recites:

A photovoltaic roofing assembly comprises a roofing membrane (102), a plurality of photovoltaic modules (104, 106, 108) disposed as a layer on top of the roofing membrane (102), and a plurality of pre-formed spacers, pedestals or supports (112, 114, 116, 118, 120, 122) which are respectively disposed below the plurality of photovoltaic modules (104, 106, 108) and integral therewith, or fixed thereto. Spacers (112, 114, 116, 118, 120, 122) are disposed on top of roofing membrane (102). Membrane (102) is supported on conventional roof framing, and attached thereto by conventional methods. In an alternative embodiment, the roofing assembly may have insulation block (322) below the spacers (314, 314', 315, 315'). The geometry of the preformed spacers (112, 114, 116, 118, 120, 122, 314, 314', 315, 315') is such that wind tunnel testing has shown its maximum effectiveness in reducing net forces of wind uplift on the overall assembly. Such construction results in a simple, lightweight, self-ballasting, readily assembled roofing assembly which resists the forces of wind uplift using no roofing penetrations.⁶

II. CLAIM TERMS AT ISSUE

The parties agree that the term “fluidly coupling” means “allowing a fluid, such as air, to pass through and around allowing the open region below a module to connect with the upper surface of the module.”⁷ The court adopts the parties’ construction of that term. The following terms are in dispute.

1. Spacer Terms: spacer; variable-height spacer

⁵ ‘988 patent, 1:22-26.

⁶ ‘988 patent, Abstract.

⁷ D.I. 83, Ex. A at 6.

Representative claim 1⁸ of the '988 patent recites:

1. A photovoltaic assembly comprising:

A building rooftop;

a photovoltaic module having sides and having upper and lower surfaces; and

a *spacer* secured to the lower surface of the photovoltaic module and supported by the building rooftop;

said *spacer* sized and configured to define:

an open region beneath said lower surface, said open region extending between and in contact with the lower surface and in direct contact with the building rooftop, and

including access openings formed therein for fluidly coupling said open region to said upper surface;

said access openings extending along at least two sides of said photovoltaic module;

whereby wind uplift forces are resisted when said photovoltaic assembly is mounted to the building rooftop.⁹

Representative claim 36 of the '988 patent recites:

36. A photovoltaic roofing assembly comprising:

a plurality of photovoltaic assemblies, each said photovoltaic assembly comprising:

a photovoltaic module having upper, lower, and lateral sides and having upper and lower surfaces; and

a *variable-height spacer* secured to the lower surface of the photovoltaic module so to orient said photovoltaic module at an angle with said lateral sides extending downwardly from said upper side to said lower side, said angle being about 5°-30° from

⁸ As incorporated in and part of asserted dependent claims 17, 18, 58, and 73.

⁹ '988 patent, claim 1 (emphasis added).

horizontal;

said *spacer* sized and configured to define:

a tapered open region beneath said lower surface; and

access openings along said upper and lower sides fluidly coupling said open region to said upper surface;

whereby wind uplift forces are resisted when said photovoltaic assembly is mounted to a support surface; and

means for interengaging adjacent photovoltaic assemblies into an array of photovoltaic assemblies, said array defining a perimeter.¹⁰

Plaintiff's proposed construction for "spacer" is "structure(s) providing support for the module(s), ensuring consistent spacing between the modules." Its proposed construction for "variable-height spacer" is "a spacer that supports the module or modules at an incline."

Defendant's proposed construction for "spacer" is "a single structure that supports a module." Its proposed construction for "variable-height spacer" is "a single structure that supports a module at an incline."

The parties agree these terms at least require a structure that provides support for the module and that a "variable-height spacer" supports a module at an incline. The primary disagreement is whether the "spacer" in these terms is limited to a "single structure."

Claims 1 and 36 recite "a spacer" and "a variable-height spacer." The Federal Circuit:

has repeatedly emphasized that an indefinite article "a" or "an" in patent

¹⁰ '988 patent, claim 36 (emphasis added).

parlance carries the meaning of “one or more” in open-ended claims containing the transitional phrase “comprising.” That “a” or “an” can mean “one or more” is best described as a *rule*, rather than merely as a presumption or even a convention. The exceptions to this rule are *extremely limited*: a patentee must evince[] a clear intent to limit “a” or “an” to “one.” The subsequent use of definite articles “the” or “said” in a claim to refer back to the same claim term does not change the general plural rule, but simply reinvokes that non-singular meaning. An exception to the general rule that “a” or “an” means more than one *only arises* where the language of the claims themselves, the specification, or the prosecution history *necessitate* a departure from the rule.¹¹

The court finds that the intrinsic record does not necessitate departure from the rule and the spacer terms are not limited to a single structure. Claims 1 and 36 recite “a spacer” and “a variable-height spacer.” Defendant points to other claims, e.g., dependent claim 14 and independent claim 80, as requiring “a plurality” of “spacers” to support its position that the disputed terms are limited to a single structure. The Federal Circuit noted:

There is presumed to be a difference in meaning and scope when different words or phrases are used in separate claims. To the extent that the absence of such difference in meaning and scope would make a claim superfluous, the doctrine of claim differentiation states the presumption that the difference between claims is significant.¹²

Here, however, there is a difference in claim scope between claims 1 and 36 and claims 14 and 80 that makes no claim superfluous. While claims 1 and 36 would cover embodiments having “one or more” spacers, claims 14 and 80, which *require* a plurality of spacers, would only cover embodiments having multiple spacers. For instance,

¹¹ *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342-43 (Fed. Cir. 2008) (emphasis added) (alteration in original) (internal quotation marks and citations omitted).

¹² *Comark Comms., Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (citation and quotation marks omitted).

figures 1C and 1D illustrate an embodiment described as having a single spacer supporting a module.¹³ In contrast, figures 1A and 1B illustrate an embodiment described as having a plurality of spacers.¹⁴ Because claims 1 and 36 can cover embodiments having “one or more” spacers, those claims would cover each of the embodiments illustrated by those figures, whereas claims 14 and 80 would only cover the embodiment having a plurality of spacers illustrated in figures 1A and 1B.

Because none of the intrinsic evidence, or arguments by defendant, demonstrate a necessity to deviate from the rule that “a” or “an” means “one or more,” the court adopts plaintiff’s proposed constructions that “spacer” means “structure(s) providing support for the module(s), ensuring consistent spacing between the modules”¹⁵ and “variable-height spacer” means “a spacer that supports the module or modules at an incline.”

2. access openings

Both representative claims 1 and 36, cited above are relevant to the analysis of the disputed term “access opening.” Specifically, “access openings extending along at least two sides of said photovoltaic module” in claim 1 and in claim 36, the language

¹³ ‘988 patent, Figs. 1C, 1D; 4:65-5:18.

¹⁴ ‘988 patent, Fig. 1A, 1B; 4:15-46.

¹⁵ The specification supports the final language of plaintiff’s proposed construction. Describing Figure 2B, the specification explains “[s]pacers 220, 220', 222, 222', 226, 226', 228, 228' also *ensure consistent spacing between the PV modules . . .*” ‘988 patent, 6:19-20 (emphasis added). The court also notes claim 3 of the ‘988 patent recites: “The assembly according to claim 2 wherein said *spacer comprises multiple spacer elements*, at least one element secured to said lower surface along each of said at least three sides. ‘988 patent, claim 3 (emphasis added). At the *Markman* hearing, defendant agreed that a single spacer can be made up of multiple elements. *Markman* Tr. at 33:1-6.

“access openings along said upper and lower sides fluidly coupling said open region to said upper surface.”

Plaintiff’s proposed construction is “openings connecting the upper surface of the photovoltaic module(s) to the open region beneath the photovoltaic module(s).”

Defendant’s proposed construction is “openings in the spacer along the sides of the module.”

Defendant states the parties’ dispute regarding this term is whether the openings must be in the “spacer” or whether any opening that connects the upper surface of the module to the open region beneath the module meets the limitation.¹⁶ Defendant’s proposed construction, however, is largely predicated on the same argument it made with regard to the spacer terms, i.e., that the claims are limited a single spacer, an argument the court rejects.

Defendant cites an embodiment where the access opening is in a spacer: “[i]n Figs. 1C and 1D spacer 132 is shown pre-formed with openings 150, 152 which enable free air exchange at the low and high sides of the module 106 to the underside of the module 106.”¹⁷ In construing the spacer terms, however, the court determined claims 1 and 36 were not limited to only covering that embodiment.

Claim 36 requires the spacer “to define” an “open region” below the “lower surface” of the module and “access openings” along the “upper and lower sides” of the module that “fluidly coupl[es]” the “open region” to the “upper surface” of the module.¹⁸

¹⁶ D.I. 111 at 36-37.

¹⁷ ‘988 patent, 4:66-5:2.

¹⁸ Defendant focuses on the language of claim 1, “access openings formed therein,” which is not included in claim 36. At the *Markman* hearing, defendant stated

The embodiment illustrated in Figure 1B has access openings that are not in a spacer. Also, the specification does not limit access openings to those in a particular spacer. In the “Summary of the Invention,” the specification states “[t]he spacers are preferably pre-formed and are sized and configured *to provide passageways beneath the photovoltaic modules extending from at least two sides of the modules* to reduce uplift forces on the modules.”¹⁹ “Spacers 314, 315’ preferably follow the periphery of module 306 while *leaving openings to the interior of tile 301* that are between 5% to 50% of the edge length of module 306.”²⁰ “Poor performance is experienced where there is continuous blocking of the interior cavity around the perimeter of the module. Optimal holddown occurs where the modules have *some small degree of opening to the interior cavity*, in the range of 10%-30%.”²¹

Consequently, the court adopts plaintiff’s proposed construction of “access openings” to mean “openings connecting the upper surface of the photovoltaic module(s) to the open region beneath the photovoltaic module(s).”

3. whereby wind uplift forces are resisted

Representative claim 36 of the ‘988 patent includes the disputed term “whereby wind uplift forces are resisted when said photovoltaic assembly is mounted to a support

that neither party contends there is a difference in claim scope because of that difference in claim language. *Markman* Tr. at 40:1-3. Because the court’s construction of the spacer terms includes claim coverage of embodiments not specifically requiring the access opening be in a spacer itself, and the parties’ agreement that the scope of claims 1 and 36 are the same, the court rejects defendant’s argument based on this difference in language between those two claims.

¹⁹ ‘988 patent, 2:47-51 (emphasis added).

²⁰ ‘988 patent, 6:59-62 (emphasis added).

²¹ ‘988 patent, 7:2-6 (emphasis added).

surface” (the “Whereby Clause”).

Plaintiff’s proposed construction is “whereby wind uplift forces are resisted in excess of the resistance provided by the weight of the assembly alone.”

Defendant argues this term cannot be construed and is invalid pursuant to 35 U.S.C. § 112.

Like claim construction, “[i]ndefiniteness is a question of law”²² “Because a patent is presumed to be valid, the evidentiary burden to show facts supporting a conclusion of invalidity is one of clear and convincing evidence.”²³ “[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.”²⁴ “[A] claim must be ‘sufficiently definite to inform the public of the bounds of the protected invention, i.e., what subject matter is covered by the exclusive rights of the patent.’”²⁵ Attorney argument is generally insufficient to demonstrate invalidity.²⁶

²² *H-W Tech., L.C. v. Overstock.com, Inc.*, 758 F.3d 1329, 1332 (Fed. Cir. 2015) (citing *Exxon Research & Eng’g Co. v. United States*, 265 F.3d 1371, 1376 Fed. Cir. 2001)).

²³ *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1345 (Fed. Cir. 2007) (citing *AK Steel Corp. v. Sollac & Ugine*, 344 F.3d 1234, 1338-39 (Fed. Cir. 2003)).

²⁴ *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014).

²⁵ *Ancora Techs., Inc. v. Apple, Inc.*, 744 F.3d 732, 737 (Fed. Cir. 2014) (quoting *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008)).

²⁶ See, e.g., *Research Frontiers, Inc. v. E Inc. Corp.*, C.A. No. 13-1231-LPS, 2016 WL 1169580, at *22 (Mar. 24, 2016) (“[T]he court believes an indefiniteness challenge should be addressed with the benefit of a more developed record. Here, declining to address [defendant’s] argument is appropriate, as [defendant] provides only attorney argument in support of its position, which is insufficient to establish indefiniteness.” (citing *WesternGeco LLC v. ION Geophysical Corp.*, 876 F. Supp. 2d 857, 875 (S.D. Tex. 2012) (“Defendant’s unsupported attorney argument fails to prove indefiniteness by clear and convincing evidence.”); *Cacace v. Meyer Mktg. Co., Ltd.*,

Defendant previously filed an early motion for summary judgement urging the court, *inter alia*, to find the asserted claims of the '988 patent invalid based on its assertion that the Whereby Clause was indefinite.²⁷ The court declined to make that finding and denied defendant's motion on that issue.²⁸ At the current *Markman* stage, defendant reiterates much of its summary judgment arguments, with minimal additional evidence, in support of its indefiniteness contentions. Therefore, the court again declines to accept defendant's indefiniteness argument and finds that one of skill in the art examining the intrinsic evidence would understand that the Whereby Clause means "whereby wind uplift forces are resisted in excess of the resistance provided by the weight of the assembly alone."²⁹

812 547, 561 (S.D.N.Y. 2011) (explaining that "mere attorney argument is insufficient to establish invalidity based in indefiniteness").

²⁷ D.I. 69.

²⁸ D.I. 88.

²⁹ This construction is supported by the specification. See, e.g., '988 patent 3:61-64 ("FIGS. 1A to 1D show views of one embodiment of the invention with spacers resting directly on a roofing membrane and with spacer geometry designed to minimize wind uplift on the overall assembly."); '988 patent, 4:66-5:6 ("In FIGS. 1C and 1D spacer 132 is shown pre-formed with openings 150, 152 which enable free air exchange at the low and high sides of module 106 to the underside of the module 106. Such free air exchange with the spacer geometry shown had been determined through wind-tunnel testing to aid in the instantaneous equilibration of air pressures between the top and bottom side of module 106, thus reducing net forces of wind uplift."); '988 patent, 4:35-40 ("The assembly is lightweight (9.76-19.53 kg/sq. m or 2-4 pounds/sq. ft.) relative to conventional roofing ballast (48.8-73.2 kg/sq. m or 10-15 pounds/sq. ft.) relying on a combination of weights, edge to edge connection, and spacer geometry to resist the forces of wind uplift."); see *also* D.I. 75 (Declaration of Theodore Stathopoulos, Ph.D. at ¶¶ 20-23) (Stathopoulos opines the "essence of the invention" is that "its light weight photovoltaic assemblies resist wind uplift not because of weight alone but because of the aerodynamic features of the assemblies," which one of skill in the art would understand. He further opines the "fact that wind uplift forces are resisted by the claimed assemblies not because of their weight alone but also because of the particular structural elements of those claims is described in detail throughout the specification of the '988 patent, and would be readily understood to be so by one of skill in the arts.

4. Weight Terms: combined weight of about 2-4 (or 1.67-5) pounds per square foot; plurality of PV assemblies has a weight of not more than about four pounds per square foot

Representative claim 18 of the '988 patent recites:

18. The assembly according to claim 1 wherein said photovoltaic module and spacer have a *combined weight of about two to four [or 1.67-5] pounds per square foot.*³⁰

Representative claim 40 of the '988 patent recites:

40. The assembly according to claim 36 wherein said *plurality of photovoltaic assemblies has a weight of no more than about four pounds per square foot.*³¹

Plaintiff originally proposed construing “combined weight of about 2-4 (or 1.67-5) pounds per square foot” as “the distributed weight of the assembly over the surface area covered by the assembly is about 2-4 (or 1.67-5) pounds per square foot.” During briefing, it modified its proposed construction to “distributed weight over the surface area covered by the assembly of about 2-4 (or 1.67-5) pounds per square foot.” Its proposed construction of “plurality of PV assemblies has a weight of not more than about four pounds per square foot” is “the distributed weight of the plurality of PV assemblies over the surface area covered by the assemblies is not more than about four pounds per square foot.”

Defendant argues these terms cannot be construed and are invalid pursuant to 35 U.S.C. § 112.

Also, the additional limitations recited in the asserted claims in this case would further define the scope of the claims, including the resistance of wind uplift, to a person of ordinary skill in the art.”).

³⁰ '988 patent, claim 18 (emphasis added); claims 58-66.

³¹ '988 patent, claim 40 (emphasis added).

Defendant contends the issues with these terms are the question of what is supposed to have a combined weight of “about” 2 to 4, or not more than “about” four, pounds per square foot and that the patent purportedly provides no guidance as to what an acceptable variance might be to avoid infringement.

The court finds defendant has not established, by clear and convincing evidence, that these terms are indefinite due to a failure “to inform, with reasonable certainty, *those skilled in the art* about the scope of the invention.”³² Other than attorney argument, defendant offers no expert testimony supporting its position that these terms are indefinite. To the extent that defendant’s argument rests on the assertion that the asserted claims cover only the weight of a single spacer and a single module, the court has rejected that interpretation. Additionally, at the *Markman* hearing, plaintiff acknowledged that if additional components (e.g., perimeter ballast or windspoils) are present, those components would be included in the claimed average weights.³³

The Federal Circuit has noted that the term “‘about’ . . . is a descriptive term commonly used in patent claims to ‘avoid a strict numerical boundary to the specified parameter.’”³⁴ The word “about,” however, “does not have a universal meaning in patent claims, and . . . the meaning depends on the technological facts of the particular

³² *Nautilus*, 134 S. Ct. at 2124 (emphasis added).

³³ *Markman* Tr. at 114:23-116:5; Plaintiff’s hearing presentation slide 36.

³⁴ *Ecolab, Inc. v. Evirochem, Inc.*, 264 F.3d 1358, 1367 (Fed. Cir. 2001) (quoting *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1217 (Fed. Cir. 1995)); see also *Andrew Corp. v. Gabriel Elecs., Inc.*, 847 F.2d 819, 521-22 (Fed. Cir. 1988) (noting that terms such as “approach each other,” “close to,” “substantially equal,” and “closely approximate” are ubiquitously used in patent claims and that such usages, when serving reasonably to describe the claimed subject matter *to those of skill in the field of the invention*, and to distinguish the claimed subject matter from the prior art, have been accepted in patent examination and upheld by the courts) (emphasis added).

case.”³⁵ The Federal Circuit has also held that the use of the term “about” when describing a numeric value renders a claim indefinite when the patent “gives no hint as to which mean value between the [prior art] and the [claimed value] constitutes infringement.”³⁶

Here, the court disagrees with defendant’s contention that the use of the word “about” renders these terms invalid due to giving “no hint” as to what weight constitutes infringement by a potential accused product . The patent compares the weights of the claimed invention to the prior art: “[t]he assembly is lightweight (9.76-19.53 kg/sq. m or 2-4 pounds/sq. ft.) *relative to conventional roofing ballast* (48.8-73.2 kg/sq. m or 10-15 pounds/sq. ft.), relying on a combination of weight, edge to edge connection, and spacer geometry to resist the forces of wind uplift.”³⁷ The specification also describes as an advantage of the invention “a roofing assembly which weighs *roughly one-sixth to one-third that of conventional ballasted roofs*, thus eliminating the need for added building structural support.”³⁸ Based on the comparative weights of the invention and the prior art described in the specification, one of skill in the art would be able to determine the approximate weight of a potential accused product that would, or would not, be covered by the claims.³⁹ The court adopts plaintiff’s proposed constructions of

³⁵ *Pall Corp.*, 66 F.3d at 1217.

³⁶ *Amgen, Inc. v. Chungai Pharm. Co. Ltd.*, 927 F.2d 1200, 1218 (Fed. Cir. 1991).

³⁷ ‘988 patent, 5:35-40 (emphasis added); see also ‘988 patent, 7:40-44 (“The spacer geometry serves to reduce to (sic) net forces of wind uplift, thus enabling the assembly to be lightweight (7.76-19.53 kg/sq. m or 2-4 pounds/sq. ft.) *relative to conventional roofing ballast* (48.8-73.2 kg/sq. m or 10-15 pounds/sq. ft.)”) (emphasis added).

³⁸ ‘988 patent, 3:30-33 (emphasis added).

³⁹ See, e.g., *UCB, Inc. v. KV Pharm. Co.* C.A. No. 08-233-JJF, 2009 WL 2524519, at *6 (determining in the facts of that case that “the word ‘about’ should simply

these terms to mean “distributed weight over the surface area covered by the assembly of about 2-4 (or 1.67-5) pounds per square foot” and “the distributed weight of the plurality of PV assemblies over the surface area covered by the assemblies is not more than about four pounds per square foot.”

5. means for interlocking

Representative claim 71 of the ‘988 patent recites:

71. The assembly according to claim 55 wherein said photovoltaic assembly comprises *means for interlocking one photovoltaic assembly to an adjacent photovoltaic assembly*.⁴⁰

Representative claim 72 of the ‘988 patent recites:

72. The assembly according to claim 56 wherein said photovoltaic/building rooftop assembly comprises *means for interlocking one said photovoltaic assembly to another said photovoltaic assembly*.⁴¹

The parties agree “means for interlocking” is a means-plus-function term and that the function specified by “means for interlocking” is “to attach one photovoltaic assembly to an adjacent photovoltaic assembly.” In light of the parties’ agreement, the court adopts their proposed function for this term.

Plaintiff’s proposed corresponding structure is “the structures shown in the figures, including interlocking joints, for example, tongue and groove structures, edge connection with mechanical clips, intersecting c-channels, adhesives, skewer inserts or any other structural equivalent manner of interlocking.”

Defendant’s proposed corresponding structure is “photovoltaic assemblies

be construed to mean ‘approximately’”).

⁴⁰ ‘988 patent, claim 71 (emphasis added).

⁴¹ ‘988 patent, claim 72 (emphasis added).

having: interlocking tongue and groove joints along the adjoining lateral edges; edge-to-edge connection via mechanical clips; edge-to-edge connection via c-channels; edge-to-edge connection via adhesives; or skewer inserts or any structural equivalent manner of interlocking the lateral edge of one photovoltaic assembly with the lateral edge of an attached photovoltaic assembly.”

“When looking to the specification for the structure of a § 112 ¶ 6 claim, one must construe the claim in accordance with all the structures disclosed by the inventor.”⁴²

The parties’ proposed structures each recite the same components for attaching one photovoltaic assembly to an adjacent photovoltaic assembly.⁴³ Their primary disagreement on the “means for interlocking” term is whether those components must attach assemblies edge-to-edge.⁴⁴

Although, the claims do not recite “edge-to-edge” attachment of one photovoltaic assembly to an adjacent photovoltaic assembly, the specification provides support for such requirement. The specification states:

In FIGS. 1C and 1D spacer 132 preferably has a tongue profile 160 along

⁴² *Playtex Prods., Inc. v. Procter & Gamble Co.*, 400 F.3d 901, 909 (Fed. Cir. 2005); *see also Serrano v. Telular Corp.*, 111 F.3d 1578, 1583 (Fed. Cir. 1997) (“Disclosed structure [for the purposes of a means-plus-function claim construction] includes that which is described in a patent specification, including any alternative structures identified.”).

⁴³ Although plaintiff complains defendant’s proposed structure excludes c-channels, defendant does include c-channels in its proposal. While defendant argues “the specification of the ‘988 patent actually does not disclose coupling of adjacent assemblies using c-channels . . . PanelClaw’s proposed construction fairly recognizes that the ‘988 patent discloses c-channels in this other context and, therefore, a person of ordinary skill could understand that edge-to-edge connection of adjacent photovoltaic assemblies using c-channels, mechanical clips, adhesives, etc. is possible.” D.I. 111 at 62.

⁴⁴ *Id.* at 54.

two edges and a groove profile 162 along its other *two edges* such that spacer 132 interlocks with adjacent spacers. In this way, *interlocking joints are formed between adjacent integral assemblies* for better resistance to wind uplift. However, *any means of integral locking is possible.*⁴⁵

The court does not read “any means of integral locking is possible” to mean other than edge-to-edge interlocking, but rather, to mean edge-to-edge interlocking by means other than a tongue and groove. This understanding is supported by the disclosure near the end of the specification that: “[a]s further example, whereas the *edge to edge connection between adjacent modules* was often shown as a tongue and groove assembly, any means of *edge connection* is possible, including mechanical clips, adhesives, ‘skewer’ inserts which penetrate the insulation block, and other means.”⁴⁶

The court also notes that in prior litigation involving the ‘988 patent, a district court similarly found the disclosed structure for this term required edge connection: “[t]he structure disclosed in the specification that corresponds to the claimed function is identified as: ‘modules or spacers with interlocking joints *along the adjoining lateral edges.*’”⁴⁷

The court therefore determines that the corresponding structure for “means for interlocking” is: “photovoltaic assemblies having: interlocking tongue and groove joints along the adjoining lateral edges; edge-to-edge connection via mechanical clips; edge-to-edge connection via c-channels; edge-to-edge connection via adhesives; or skewer inserts or any structural equivalent manner of interlocking the lateral edge of one

⁴⁵ ‘988 patent, 5:14-20 (emphasis added).

⁴⁶ ‘988 patent, 8:32-37 (emphasis added).

⁴⁷ *SunPower Corp. v. Sunlink Corp.*, No. CV 08-2807 SBA, 2009 WL 2996724, at *1 (N.D. Cal. Mar. 16, 2009) (emphasis added).

photovoltaic assembly with the lateral edge of an attached photovoltaic assembly.”

6. means for interengaging adjacent photovoltaic assemblies into an array of photovoltaic assemblies, said array defining a perimeter

Representative claim 36, previously cited in full, contains the specific language “means for interengaging adjacent photovoltaic assemblies into an array of photovoltaic assemblies, said array defining a perimeter.”

The parties agree this term is a means-plus-function term.

Plaintiff’s proposed function is “coupling adjacent photovoltaic assemblies into an array.” Its proposed corresponding structure is “the structures shown in the figures, including interlocking joints, for example, tongue and groove structures, intersecting c-channels, edge connection with mechanical clips, adhesives, skewer inserts or any other structural equivalent manner of interengaging.”

Defendant’s proposed function is “to create an interconnected array of PV assemblies.” Its proposed corresponding structure is “spacers and modules that are attached to adjacent spacers and modules via a tongue and groove edge-to-edge connection, or edge-to-edge connection through c-channels, mechanical clips, adhesives, or skewer inserts.”

As to the function of this term, the court adopts plaintiff’s proposal. The court agrees with plaintiff that one of ordinary skill in the art would understand that “interengaging” is synonymous with “coupling.”⁴⁸ Further, plaintiff’s proposal tracks the

⁴⁸ Defendant uses the word “coupling” itself in discussing its proposed structure: “PanelClaw’s proposed construction captures the structures disclosed in the ‘988 patent for *coupling* one photovoltaic assembly to an adjacent photovoltaic assembly, and even includes forms of *coupling* that are described in other contexts.” D.I. 111 at 62 (emphasis added).

claim language that “adjacent photovoltaic assemblies” are “interengaged,” or coupled, “into an array.” The court determines, therefore, that the function of this term is “coupling adjacent photovoltaic assemblies into an array.”

As with the “means for interlocking” term, the parties’ proposed structures for “means for interengaging” each recite the same components for attaching one photovoltaic assembly to an adjacent photovoltaic assembly. The parties’ primary dispute over the structure of the “means for interengaging” term is, again, whether there is a requirement that the assemblies are attached edge-to-edge.

The parties are in apparent agreement that “interlock” and “interengage” are synonymous. In briefing, plaintiff stated “[o]ne of ordinary skill in the art would understand that in this context the terms ‘interlock’ and ‘interengage’ are synonymous and would look to the recited interlocking structures to perform the ‘interengaging’ function.”⁴⁹ At the *Markman* hearing, defendant stated:

The word interengaging does not appear in the ‘988 patent. So I don’t think there’s any disagreement between the parties that the places you look for interlocking are the places you look for interengaging. I can’t speak for SunPower, but I don’t see any place where the patent is distinguishing between interengaging on the one hand and interlocking on the other.⁵⁰

The parties’ agree that “interengaging” and “interlocking” are synonymous. Therefore, the structures disclosed for the interlocking means are the same structures that may perform the “interengaging” function. Consequently, the court determines edge-to-edge connection to be required for this term for the reasons discussed with

⁴⁹ *Id.* at 61.

⁵⁰ *Markman* Tr. at 146:4-12.

respect to “means for interlocking.” Consequently, court finds the corresponding structure for “means for interengaging” is “spacers and modules that are attached to adjacent spacers and modules via a tongue and groove edge-to-edge connection, or edge-to-edge connection through c-channels, mechanical clips, adhesives, or skewer inserts.”

7. means for resisting wind uplift forces sufficiently to eliminate the need for penetrations to the rooftop

Representative claim 73 of the ‘988 patent recites:

73. The assembly according to claim 1 wherein said assembly further comprises *means for resisting forces of wind uplift sufficiently to eliminate the need for penetrations of the building rooftop.*⁵¹

The parties agree this is a means-plus-function term.

Plaintiff’s proposed function is “resisting wind uplift to allow mounting with no penetrations of the rooftop.” Its proposed corresponding structure is “structures shown in Figs. 1-4, including a combination of the configuration of the spacers and interlocking or the use of windspoils, or the equivalents of these structures.”

Defendant argues this term cannot be construed and is invalid pursuant to 35 U.S.C. § 112. Alternatively, defendant’s proposed function is “to resist the force of wind uplift enough that the assembly does not require roof penetrations.” Its proposed corresponding structure is “interlocking spacers and/or modules and pavers secured around the perimeter of the array.”

Defendant’s arguments that this term is indefinite primarily rest on its assertion that claim 1, from which claim 73 depends, only covers an embodiment having a single

⁵¹ ‘988 patent, claim 73 (emphasis added).

spacer and a single module, an assertion the court has rejected. It also contends this term is indefinite for the same reasons it sets forth in its argument that the Whereby Clause is indefinite. The court determined that the Whereby Clause is not indefinite and finds defendant's arguments equally unpersuasive with regard to this term.

Although in the parties' briefing each proposed a slightly different function, at the *Markman* hearing plaintiff agreed the proposed functions were very similar and it did not necessarily believe there was much of a difference in the proposals as "it's sort of two ways of saying the same thing."⁵² Therefore, the court adopts defendant's proposed function for this term: "to resist the force of wind uplift enough that the assembly does not require roof penetrations."

The court finds that plaintiff's proposed structure is supported by the figures and specification. In the Background of the Invention, the specification states "[t]his invention generally relates to a photovoltaic roofing assembly, and in particular to a lightweight photovoltaic roofing assembly *requiring no roofing penetrations and which resists wind up-lift due to specialized component geometry and by acting as an integral assembly.*"⁵³ The patent discloses various embodiments performing the recited function. For instance, describing figures 1A-1D, the patent states "FIGS. 1A to 1D show views of one embodiment of the invention with spacers resting directly on a roofing membrane and with spacer geometry designed to minimize wind uplift on the overall assembly."⁵⁴ The specification recites "free air exchange with the spacer

⁵² *Markman* Tr. at 163:1-24.

⁵³ '988 patent, 1:22-26 (emphasis added).

⁵⁴ '988 patent, 3:61-64.

geometry shown has been determined through wind-tunnel testing to aid in the instantaneous equilibration of air pressures between the top and bottom side of module 106, thus reducing net forces of wind uplift.”⁵⁵ “The tapered profile 140 [of the spacer] serves as an aerodynamic wind-block, causing wind which is traveling from the right in the drawing to flow over the top of module 106, and obstructing its entry to the backside of module 106.”⁵⁶ The patent also describes formation of “interlocking joints” “between adjacent integral assemblies for better resistance to wind uplift”⁵⁷ and the use of “windspoils 260, 262, 264, 266, 268 in order to deflect surface winds from entering below modules 204, 206, 208, 210, 212.”⁵⁸

The court disagrees with defendant that a corresponding structure must include perimeter securement. In the prior litigation involving the ‘988 patent, the district court determined the disclosed structure of this term was “[a] combination of the configuration of the spacers and interlocking or use of wind spoils.”⁵⁹ Although somewhat narrower than the structure plaintiff is suggesting here, that court construed this term and the structure disclosed in the specification did not include “pavers secured around the perimeter of the array” as defendant proposes. More importantly, claim 22 of the ‘988 patent, which ultimately depends from claim 1, adds a perimeter securement requirement: “[t]he assembly of claim 19[, which depends from claim 1,] further comprising perimeter ties situated around the photovoltaic array and joined with said

⁵⁵ ‘988 patent, 5:2-6.

⁵⁶ ‘988 patent, 5:10-13.

⁵⁷ ‘988 patent, 5:17-19.

⁵⁸ ‘988 patent, 6:32-34; *see also, e.g.*, ‘988 patent, 6:56-7:9; 7:19-44; 8:32-45.

⁵⁹ *SunPower Corp. v. Sunlink Corp.*, No. CV 08-2807 SBA, 2009 WL 2996724, at *2 (N.D. Cal. Mar. 16, 2009) (emphasis added).

photovoltaic array to make an integral array assembly.”⁶⁰ Because dependent claim 22 adds the requirement of “perimeter ties,” that requirement is not included in claim 1 and thus, is not required in claim 73, which does not include a perimeter securement element.

The court determines the structure disclosed in the specification of the ‘988 patent that corresponds to the claimed function is “structures shown in Figs. 1-4, including a combination of the configuration of the spacers and interlocking or the use of windspools, or the equivalents of those structures.”

Order: The Court’s Claim Construction

At Wilmington, this 31st day of August, 2016, having heard oral argument, having reviewed the papers submitted with the parties’ proposed claim constructions, and having considered all of the parties’ arguments (whether or not explicitly discussed herein);

IT IS ORDERED that the disputed claim language in the asserted claims of the patent-in-suit, as identified by the parties, shall be construed below consistent with the tenets of claim construction set forth by the United States Court of Appeals for the Federal Circuit in *Phillips v. AWH Corp.*,⁶¹ as follows:

Claim Term	Construction
fluidly coupling	allowing a fluid, such as air, to pass through and around allowing the open region below a module to connect with the upper surface of the module

⁶⁰ ‘988 patent, claim 22 (emphasis added).

⁶¹ 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*).

Claim Term	Construction
spacer	structure(s) providing support for the module(s), ensuring consistent spacing between the modules
variable-height spacer	a spacer that supports the module or modules at an incline
access openings	openings connecting the upper surface of the photovoltaic module(s) to the open region beneath the photovoltaic module(s)
whereby wind uplift forces are resisted	whereby wind uplift forces are resisted in excess of the resistance provided by the weight of the assembly alone
combined weight of about 2-4 (or 1.67-5) pounds per square foot plurality of PV assemblies has a weight of not more than about four pounds per square foot	distributed weight over the surface area covered by the assembly of about 2-4 (or 1.67-5) pounds per square foot the distributed weight of the plurality of PV assemblies over the surface area covered by the assemblies is not more than about four pounds per square foot
means for interlocking	<p>Function: to attach one photovoltaic assembly to an adjacent photovoltaic assembly</p> <p>Structure: photovoltaic assemblies having: interlocking tongue and groove joints along the adjoining lateral edges; edge-to-edge connection via mechanical clips; edge-to-edge connection via c-channels; edge-to-edge connection via adhesives; or skewer inserts or any structural equivalent manner of interlocking the lateral edge of one photovoltaic assembly with the lateral edge of an attached photovoltaic assembly.</p>

Claim Term	Construction
<p>means for interengaging adjacent photovoltaic assemblies, said array defining a perimeter</p>	<p>Function: coupling adjacent photovoltaic assemblies into an array</p> <p>Structure: spacers and modules that are attached to adjacent spacers and modules via a tongue and groove edge-to-edge connection, or edge-to-edge connection through c-channels, mechanical clips, adhesives, or skewer inserts</p>
<p>means for resisting wind uplift forces sufficiently to eliminate the need for penetrations to the rooftop</p>	<p>Function: to resist the force of wind uplift enough that the assembly does not require roof penetrations</p> <p>Structure: structures shown in Figs. 1-4, including a combination of the configuration of the spacers and interlocking or the use of windspoils, or the equivalents of those structures</p>

/s/ Mary Pat Thyng
 UNITED STATES MAGISTRATE JUDGE