IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

CAO LIGHTING, INC., Plaintiff, v. GENERAL ELECTRIC COMPANY, CONSUMER LIGHTING (U.S), LLC d/b/a GE LIGHTING, and CURRENT LIGHTING SOLUTIONS, LLC, Defendants.	)	C.A. No. 20-681 (MN)
CAO LIGHTING, INC., Plaintiff, v. OSRAM SYLVANIA, INC. and LEDVANCE LLC, Defendants.	)	C.A. No. 20-690 (MN)

MEMORANDUM ORDER

At Wilmington this 10th day of May 2022:

IT IS HEREBY ORDERED that the claim terms of U.S. Patent No. 6,465,961 ("the '961 patent") with agreed-upon constructions are construed as follows (*see* D.I. 213 at 2)[1]:

1. "a contact layer on which an electron may be mounted for powering said chip" should be corrected to include "electrode" instead of "electron" ('961 Patent, claim 7 and all claims depending therefrom);

[1] All docket item citations are to C.A. No. 20-681.

2. "said support is substantially positioned outside said interior volume" means the majority of the support is located outside of the interior volume ('961 Patent, claim 52 and all claims depending therefrom);

As announced at the hearing on March 24, 2022, IT IS HEREBY ORDERED that the disputed claim terms of the '961 Patent are construed as follows:

1. "said enclosure being fabricated from a material substantially transparent to white light" has its plain and ordinary meaning, which is "the enclosure is fabricated from a material that is substantially transparent to white light." ('961 Patent, claim 1 and all claims depending therefrom);

2. "an interior volume within said enclosure" means "the interior volume is contained inside the enclosure" ('961 Patent, claim 1 and all claims depending therefrom);

3. "a heat sink located in said interior volume" has its plain and ordinary meaning, which is "a heat sink is a substance or device that absorbs or draws heat from another object and is in the interior volume of the enclosure, but does not need to be entirely within the interior volume" ('961 Patent, claim 1 and all claims depending therefrom);

4. "said panels on said heat sink being oriented to facilitate emission of light from the semiconductor light source in desired directions around the semiconductor source light source" means "the panels on the heat sink are oriented to facilitate the emission of light in any desired (intended or predetermined) direction including the same direction" ('961 Patent, claim 1 and all claims depending therefrom);

5. "LED modules" means "a package containing at least one LED, whether that is an LED chip or LED array" ('961 Patent, claim 1 and all claims depending therefrom);

6. "a first and a second reflective layers … serving to reflect light emitted by said active layer" is construed as "the first and second reflective layers are distinct from each other and reflect light emitted by the active layer" ('961 Patent, claim 8 and all claims depending therefrom);

8. "primary heat sink" means "a first heat sink (a first substance or device that absorbs or draws heat from another object)" ('961 Patent, claim 42);

9. "plurality of panels on [the heat sink] suitable for mounting semiconductor devices thereon" has its plain and ordinary meaning, which is "two or more panels on the heat sink, with each panel being suitable for mounting semiconductor devices thereon" ('961 Patent, claim 21 and all claims depending therefrom).

Finally, as discussed below, the Court construes "a light emitting diode (LED) chip configured to output light at greater than about 40 milliwatts" as follows:

> 7. "a light emitting diode (LED) chip configured to output light at greater than about 40 milliwatts" means "at least one LED chip is capable of emitting light greater than about 40 milliwatts." ('961 Patent, claim 21).

The parties briefed the issues (*see* D.I. 210, 217, 219, 220) and submitted an appendix containing intrinsic and extrinsic evidence (*see* D.I. 199), and both parties provided a tutorial describing the relevant technology (D.I. 198, 200). The Court carefully reviewed all submissions in connection with the parties' contentions regarding the disputed claim terms, heard oral argument (*see* D.I. 229) and applied the following legal standards in reaching its decision.

I. LEGAL STANDARDS

A. Claim Construction

"[T]he ultimate question of the proper construction of the patent [is] a question of law," although subsidiary fact-finding is sometimes necessary. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837-38 (2015). "[T]he words of a claim are generally given their ordinary and customary meaning [which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc) (internal citations and quotation marks omitted). Although "the claims themselves provide substantial guidance as to the meaning of particular claim terms," the context of the surrounding words of the claim also must be considered. *Id.* at 1314. "[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent." *Id.* at 1321 (internal quotation marks omitted).

The patent specification "is always highly relevant to the claim construction analysis . . . [as] it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). It is also possible that "the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316. "Even when the specification describes only a single embodiment, [however,] the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014) (internal quotation marks omitted) (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004)).

In addition to the specification, a court "should also consider the patent's prosecution history, if it is in evidence." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). The prosecution history, which is "intrinsic evidence, . . . consists of the complete record of the proceedings before the PTO [Patent and Trademark Office] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.*

In some cases, courts "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." *Teva*, 135 S. Ct. at 841. Extrinsic evidence "consists of all evidence external to the patent and prosecution history,

including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. Expert testimony can be useful "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field." *Phillips*, 415 F.3d at 1318. Nonetheless, courts must not lose sight of the fact that "expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence." *Id.* Overall, although extrinsic evidence "may be useful to the court," it is "less reliable" than intrinsic evidence, and its consideration "is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id.* at 1318-19. Where the intrinsic record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999) (citing *Vitronics*, 90 F.3d at 1583).

B. Indefiniteness

"The primary purpose of the definiteness requirement is to ensure that the claims are written in such a way that they give notice to the public of the extent of the legal protection afforded by the patent, so that interested members of the public, *e.g.* competitors of the patent owner, can determine whether or not they infringe." *All Dental Prodx, LLC v. Advantage Dental Prods., Inc.*, 309 F.3d 774, 779-80 (Fed. Cir. 2002) (citing *Warner-Jenkinson Co. v. Hilton-Davis Chem. Co.*, 520 U.S. 17, 28-29 (1997)). Put another way, "[a] patent holder should know what he owns, and the public should know what he does not." *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 535 U.S. 722, 731 (2002).

A patent claim is indefinite if, "viewed in light of the specification and prosecution history, [it fails to] inform those skilled in the art about the scope of the invention with reasonable

certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). A claim may be indefinite if the patent does not convey with reasonable certainty how to measure a claimed feature. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1341 (Fed. Cir. 2015). But "[i]f such an understanding of how to measure the claimed [feature] was within the scope of knowledge possessed by one of ordinary skill in the art, there is no requirement for the specification to identify a particular measurement technique." *Ethicon Endo–Surgery, Inc. v. Covidien, Inc.*, 796 F.3d 1312, 1319 (Fed. Cir. 2015).

Like claim construction, definiteness is a question of law, but the Court must sometimes render factual findings based on extrinsic evidence to resolve the ultimate issue of definiteness. *See, e.g.*, *Sonix Tech. Co. v. Publications Int'l, Ltd.*, 844 F.3d 1370, 1376 (Fed. Cir. 2017); *see also Teva*, 135 S. Ct. at 842-43. "Any fact critical to a holding on indefiniteness . . . must be proven by the challenger by clear and convincing evidence." *Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1366 (Fed. Cir. 2003); *see also Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1338 (Fed. Cir. 2008).

II. THE COURT'S RULING

The Court's ruling regarding the disputed claim terms of the '961 patent were announced from the bench at the conclusion of the hearing as follows:

> At issue we have nine terms from one patent, U.S. Patent No. 6,465,961, that are the subject of dispute.
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> I am prepared to rule on all but one of the disputes. I will not be issuing a written opinion, but I will issue an order stating my rulings. I want to emphasize before I announce my decisions that although I am not issuing a written opinion, we have followed a full and thorough process before making the decisions I am about to state. I have reviewed the patent in dispute. I have also reviewed the portions of the prosecution history, the expert declarations and the other references submitted. There was full briefing on each of the disputed terms and each party submitted a technology tutorial. We

have also had argument here today. All of that has been carefully considered.

As to my rulings, I am not going to read into the record my understanding of claim construction law. I have a legal standard section that I have included in earlier opinions, including somewhat recently in *Roche Diabetes Care, Inc. v. Insulet Corp.*, C.A. No. 20-825. I incorporate that law and adopt it into my ruling today and will also set it out in the order that I issue.

Now the disputed terms.

The first term is "said enclosure being fabricated from a material substantially transparent to white light." Plaintiff proposes that this term have its plain and ordinary meaning, which it suggests is "[t]he enclosure is fabricated from a material that is substantially transparent to white light."[2] Defendants' proposed construction is that "[t]he entirety of the enclosure is fabricated from a material that is substantially transparent to white light."[3]

The crux of the dispute is whether to include Defendants' proposed narrowing limitation that the entirety of the enclosure be fabricated from a material that is substantially transparent to white light. I am not persuaded by the evidence before me that this claim should be construed in this way. The claim language itself does not specify that the entirety of the enclosure be fabricated from the claimed material. And nothing in the specification requires that the entirety of the enclosure be fabricated from a material that is substantially transparent to white light.

I also credit the opinions of Plaintiff's expert that reading the claims as Defendants urge makes little sense to a person of ordinary skill in the art. The patent's central invention is a light source, not an enclosure. Accordingly, a person of ordinary skill in the art would understand that the LED lights contemplated by the patent would use the same structure and implementation as then-existing non-LED lights.[4]

Accordingly, I adopt Plaintiff's construction. The claim does not require that the entirety of the enclosure be substantially transparent to white light. Ultimately, whether a given enclosure is

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2 (D.I. 197 at 6).

3 (*Id.*).

4 (*See* D.I. 199, JX00057 ¶ 17).

"substantially transparent to white light" shall be a fact question for the jury.

Now, to terms two and three. Both parties briefed these terms together and we addressed both terns together in the arguments today. So I will address these terms together now.

Term two is "an interior volume within said enclosure." Plaintiff proposes that this term have its plain and ordinary meaning, which it proposes is "[a]n interior volume is within the enclosure but does not need to be entirely within the enclosure."[5] Defendants propose that this term be construed as "[t]he interior volume is contained inside the enclosure that is fabricated from a material that is substantially transparent to white light."[6]

Term three is "a heat sink located in said interior volume." Plaintiff would give this term its plain and ordinary meaning, which it contends is "[a] heat sink is a substance or device that absorbs or draws heat from another object and is in the interior volume of the enclosure, but does not need to be entirely within the interior volume."[7] Defendants urge the Court to construe this term as "[a] heat sink that is contained inside the interior volume of the enclosure."[8]

The dispute for these terms is similar: whether the "interior volume" and "heat sink" must be entirely within the "enclosure" and "interior volume," respectively. Plaintiff's construction would permit the "interior volume" and "heat sink" to be only partially, not entirely, in the "enclosure" and "interior volume."

For term two, I adopt Defendants' construction. The claim language itself supports this construction. "Interior volume" refers to "volume" that is inside something. I agree with Defendants that "if the relevant 'volume' could be both inside and extend outside of 'the enclosure,' then it would not be an 'interior volume.'"[9]

Defendants' construction also finds support in the specification. At column 3, lines 9 through 12, it states "[t]he enclosure 101 encloses an interior volume 102 which may be a vacuum, or may contain a gas such as ordinary air, an inert gas such as argon or nitrogen, or

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5 (*Id.* at 14).

6 (*Id.*).

7 (*Id.* at 16).

8 (*Id.*).

9 (*Id.* at 19).

any other desired gas." If the "interior volume" extends outside of the enclosure, it would extend into space – and there'd be no possibility of creating such a vacuum or container for gas, as the specification envisions.

Plaintiff argues that the Federal Circuit recognizes that "within" has a plain and ordinary meaning that does not require that an object "within" another thing be entirely within that thing.[10] Of course, how a word is construed in one patent does not bind that word's construction in separate patents, and this dispute is a good example of why. This dispute does not rest on my construction of a single word – "within – but instead on what it means for "an interior volume" to be "within said enclosure." And I find that to be an "interior volume within" an enclosure demands that that interior volume be entirely within that enclosure.

So I construe term two according to Defendants' proposed construction, with a slight modification. I don't see any reason to construe "enclosure" in this term, as I think my construction for term one is clear. So the term will be construed as "the interior volume is contained inside the enclosure."

For term three, I adopt Plaintiff's construction. I first note that the plain and ordinary meaning of "in" is not "entirely within." I note further that the specification, at column 4, line one through three, permits the base to act as a heat sink, eliminating the need for a separate heat sink. Figures 1 and 2 depict the invention with the base not entirely within the interior volume, which supports Plaintiff's construction. I don't agree with Defendants' argument that the just-referred to lines of the specification are describing an unclaimed embodiment.

Accordingly, my construction would permit the heat sink to be partially within the interior volume, which is a space entirely within the enclosure.

Now, term four – "said panels on said heat sink being oriented to facilitate emission of light … in desired directions around the semiconductor source light source."

The parties' dispute for this term is two-fold. First, Defendants contend that this term is indefinite as to "desired directions."[11] And

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10 (*Id.* at 14 (citing *Cannon Rubber Ltd. v. The First Years, Inc.*, 163 Fed. Appx. 870 (Fed. Cir. 2005))).

11 (*Id.* at 28–30).

then Defendants propose that if I disagree about indefiniteness, the construction should be "each of the panels on the heat sink is oriented angularly with respect to each other in more than one direction in order to cause light from the LEDs to be dispersed around the semiconductor source light source."[12] Plaintiff proposes that this term be construed as "The panels on the heat sink are oriented to facilitate the emission of light in any desired (intended or predetermined) direction including the same direction."[13]

Defendants contend that "desired directions" is indefinite because the specification "fails to provide any standard to determine if an accused product infringes."[14] Defendants argue that a POSA cannot possibly determine whether a product is infringing because the specification provides no external standard related to "desired directions." I disagree.

The patent explains that "the invention relates to semiconductor light sources and illumination devices useful for providing visible light in order to partially or fully illuminate a space occupied by or viewed by humans, such as residential space, commercial space, outdoor space, the interior or exterior of a vehicle, etc."[15] The patent points out that "[p]rior art semiconductor light sources have not been successfully … used to illuminate physical spaces."[16]

Thus, read in the context of the invention, a person of skill in the art would recognize that the "desired direction" would be the space "occupied or viewed by humans." The claimed term is not "subjective in the sense that it turns on a person's tastes or opinion."[17] "Desired directions" provides an objective standard that persons of skill of the art would understand when viewing the claims in the context of the patent as a whole, and therefore the claim is not indefinite. "Desired," in the context of these claims, means "intended" or "predetermined."

It also deserves noting that the claim has been challenged in Request for Inter Partes Reexamination and Request for Ex Parte

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12 (*Id.* at 31–32).

13 (*Id.* at 26).

14 (*Id.* at 28).

15 ('961 Patent, 1:7–12).

16 (*Id.* at 1:20–22).

17 *Sonix Tech. Co. v. Publications Int'l, Ltd*., 844 F.3d 1370, 1378 (Fed. Cir. 2017).

Reexamination.[18] There, parties were comfortable considering prior art references, and did not seem to have any trouble understanding the metes and bounds of "desired directions." So that is further evidence in favor of not finding this term indefinite.

Now as to the construction of the term. The parties agree that there must be more than one panel. Defendants contend that these panels must be oriented angularly and must emit light in more than one direction. Plaintiff's construction would not impose these narrowing limitations.

Defendants argue that Plaintiff's construction adds nothing to the prior limitation, which reads "said heat sink having a plurality of panels on it suitable for mounting semiconductor devices thereon."[19] Defendants contend that the term in question "must be oriented in some way such that orientation of each panel will necessarily facilitate the emission of light in desired directions (i.e, more than one direction) around the semiconductor light source." I disagree. Plaintiff's construction does add a limitation that makes this term meaningful, as it makes clear that the panels ought to be oriented to facilitate illumination, something that the prior limitation does not require.

Defendants further contend that their construction is compelled by four words in the claim term: the plural word "panels," "oriented," the plural word "desired directions," and "around." Defendants argue that these words indicate "that the claim contemplates multiple panels being arranged or designed to produce light in multiple directions around the light source." Defendants also point out that an embodiment in the patent, Figure 2, is consistent with their interpretation.

Plaintiff does not dispute that there must be multiple panels and that they must be arranged or "oriented" in a certain way. That's what is claimed and how the invention works. So the question is whether the claim requires the panels be "oriented angularly with respect to each other in more than one direction" so that the illumination occurs in more than one direction.

Here, the specification makes clear that heat sink faces, where the panels reside, "can be oriented with respect to each other at any desired angle." The word "any" does not require "more than one direction," the limitation present in Defendants' construction. Nor does it require that the panels be oriented angularly. That the patent

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18 (*See* D.I. 199, JX00026–31).

19 ('961 Patent, 9:62–63).

> contains an embodiment consistent with Defendants' construction is of little consequence, as courts do not import limitations on the basis that they are present in an embodiment. I think the fact that the specification permits the panels to be "oriented with respect to each other at any desired angle" strongly supports Plaintiff's position.
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> Accordingly, I will construe the term to mean the panels on the heat sink are oriented to facilitate the emission of light in any desired (intended or predetermined) direction including the same direction."
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> Now, terms five and seven: "LED module" (term five) and "a light emitting diode (LED) chip configured to output light at greater than about 40 milliwatts" (term seven). We discussed these together.
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> First, LED module. Plaintiff proposes that it be given its plain and ordinary meaning, which it says is "A package containing at least one LED chip or LED array." Defendants propose that it means "operable self-contained device that includes at least one LED."
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> I have to say I am not at all clear why we are construing this term. I've been told it is not relevant to infringement and I don't really understand how it is relevant to any 112 issues. But today during the argument I asked Defendants' counsel about this term: "[w]hat's wrong with a … module just being a package that contains an LED, whether that is a chip or an array?" And Defendants' counsel said "That's fine, that's exactly what our proposal is."[20] And that is

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20 (*See* D.I. 229 at 31:19–22 ("I think if Your Honor were to go with a package that contains at least one LED I think that would get us where we generally … want to be.") Notwithstanding agreeing to this construction multiple times, Defendants' counsel at one point suggested a disagreement with the term "package" although he did not elaborate further. *Id.* at 28:25–29:2. The Court agrees with Plaintiff that "package" is appropriate. At column 1, lines 22 to 23, the specification says that "in the prior art, LED's were typically individually packaged in a module…" This is the most on-point evidence in the specification, and it supports Plaintiff's construction. The specification's descriptions of figures 2, 7a, 7b, 8a, 8b, and 9 lend further support to Plaintiff's construction, as they either include or describe a "module" or "package" that is not necessarily self-contained or operable. Further, Defendants' expert provided some evidence that supports a "module" being a "package." (JX000406 ¶ 73). He stated that "[t]he specification also references 'high power LED packages' and uses that phrase interchangeable with 'LED modules' having a certain power output." Though the expert went on to state that "a POSA would understand that the term 'LED modules' refers to operable, self-contained devices that includes at least one LED," I think the most natural reading of the specification using "high power LED packages" and "LED modules having a certain power output" interchangeably is that "LED modules" means "LED packages" and that "high-power" refers to "certain power output.").

essentially Plaintiff's proposal. So given that agreement, I will construe "LED module" to mean a "a package containing at least one LED, whether that is an LED chip or LED array."

For term seven, I need some more briefing. I will talk about that in a few minutes.

Next, term six – "a first and second reflective layers … serving to reflect light emitted by said active layer." Plaintiff proposes that this term be construed as "the first and second reflective layers are distinct from each other and reflect light emitted by the active layer." Defendants' proposed construction is "distinct layers of material that are intended to reflect more light emitted by said active layer than is absorbed by and transmitted through the layers of material."

The fundamental disagreement concerns how to make sense of the "reflective" term. Defendants submitted an expert report explaining that all material reflects light, and so every material is "reflective" in the literal sense.[21] They contend that the only way to differentiate the "reflective layer" limitation from the limitation with "cladding layers" is to demand that the term "serving to reflect light" be construed to demand that the layers reflect more light than they absorb and transmit. Plaintiff submits that Defendants' construction is unduly narrow, not supported by the intrinsic evidence, and ignores other ways of differentiating the "cladding" limitation from the "reflective" limitation.

I agree with Plaintiff. The patent twice describes the reflective layers, but never defines the precise amount of light to be reflected in a way that supports Defendants' construction.[22] Moreover, at column 5, lines 32–54, the patent clearly differentiates between cladding and reflective layers, and so I don't find Defendants' claim differentiation argument persuasive. I do, however, agree with Defendants' point that the reflective layers must reflect more than an insubstantial amount of light, and can't be negligible. I think that Plaintiff agrees with that. But I don't find enough support for the requirement in Defendants' proposal.

I will construe the term to mean "the first and second reflective layers are distinct from each other and reflect light emitted by the active layer." And I think whether any accused products have or prior art has reflecting layers that reflect a non-negligible amount of light is a question of fact for the jury.

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21 (D.I. 199 at JX000394 ¶ 40).

22 ('961 Patent, 7:44–47; 8:24-31).

The parties' next dispute is the ninth term briefed: "primary heat sink." Defendants contend that this term is indefinite, or, if not indefinite, that it should be construed to be "a heat sink which is in turn mounted to a secondary heat sink having a plurality of panels." Plaintiff's proposed construction is "A first heat sink (a first substance or device that absorbs or draws heat from another object."

Turning first to definiteness, Defendants have not shown that the term is indefinite by clear and convincing evidence. Defendants' main argument is that "'primary typically denotes particular attributes that make a structure 'primary' in relation to another structure," but the patent furnishes no way to determine whether a heat sink is "primary."[23] As Plaintiff's proposed construction indicates, it believes "primary" means "first" and points to the claim language to make its argument. It points out that claim 42 uses "primary heat sink" but does not mention a secondary "heat sink" and therefore, "primary heat sink" can easily be understood as "first heat sink."[24]

The Court agrees. A person of ordinary skill in the art would understand that "primary" means "first" because the claim term does not have a second heat sink. Therefore, searching for attributes that make the heat sink "primary" would be silly, as there'd be no second heat sink to compare the primary heat sink to. Throughout the specification, embodiments contain only a single heat sink, which is consistent with "primary" being understood as "first."[25]

And much for those same reasons, I adopt Plaintiff's proposed construction. A primary heat sink is "a first heat sink (a first substance or device that absorbs or draws heat from another object)". As explained above, "primary heat sink" is in claims without any requirement that there be a "secondary heat sink," so Defendants' construction does not make sense and is rejected.

Finally, the tenth term that was the subject of supplemental briefing: "plurality of panels on [the heat sink] suitable for mounting semiconductor devices thereon." The parties' proposed constructions are extremely similar. Plaintiff proposes the plain and ordinary meaning, which it contends is "two or more panels on the heat sink, with each panel being suitable for mounting semiconductor devices thereon." Defendants propose "[t]wo or

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23 (D.I. 197 at 66).

24 (*Id.* at 64).

25 (*See* '961 Patent, Figs. 7a, 7b, 8a, 8b, 9).

> more panels on the heat sink, with each panel being suitable for having a semiconductor device mounted directly to its surface."[26]
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> The only difference between these constructions is that Defendants' proposed construction imposes the limitation that the panels be suitable for having a semiconductor device mounted directly to its surface.
>
> I will construe the term consistent with its plain and ordinary meaning, *i.e.*, "two or more panels on the heat sink, with each panel being suitable for mounting semiconductor devices thereon." First, the word "directly" appears nowhere in the claim at issue. And nothing in the record has convinced me that there is a requirement that the panels be suitable for having a semiconductor device mounted directly to its surface. For example, the notion that the panel be suitable for having a semiconductor device be mounted directly to its surface is contradicted by claim 42, which states in relevant part that "…said LED chip is surface mounted on a primary heat sink that is mounted on one of said panels of said heat sink."[27] Further, Defendants pointed me to column 4, lines 8 through 11, which states in relevant part that "'Surface mount' LED's mounted directly on a heat sink, or other surface." This is a far cry from stating unequivocally that semiconductor devices must be mounted directly on heat sink panels.
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> Another issue was raised during argument about what a panel is. That was not briefed and I think that that is not a claim construction issue – it is an issue of fact for the jury whether what Plaintiff points to as a panel is one. Defendants' counsel seemed to agree to that today.

As noted above, the Court deferred construing the term "a light emitting diode (LED) chip configured to output light at greater than about 40 milliwatts" in claim 21, and the claims depending therefrom, to permit the parties to submit additional briefs. After further review of the papers submitted and the transcript of the argument, it will construe this term now.

Claim 21 ultimately depends on claim 1. Claim 1 includes the limitation "said semiconductor chip being selected from the group consisting of light emitting diodes, light

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26 (*See* D.I. 210).

27 ('961 Patent, Reexamination Certificate, 3:23–25).

emitting diode arrays, laser chips, LED modules, laser modules, and VCSEL chips." Claim 21 then adds that "said at least one semiconductor chip is a light emitting diode (LED) chip configured to output light at greater than about 40 milliwatts." Plaintiff argues that the disputed term should have its plain and ordinary meaning, which it contends is "at least one LED chip is capable of emitting light greater than about 40 milliwatts." (D.I. 217 at 55; D.I. 220). Defendants propose that the term be construed as "an LED that alone is capable of emitting light having power than greater than about 40mW." (D.I. 217 at 55; D.I. 219). The parties' dispute centers on whether claim 21's "LED chip" encompasses both a light emitting diode and an LED array, and boils down to whether an "LED chip" may have more than a single light emitting diode.

Plaintiff argues that its construction, which permits an LED chip to have multiple light emitting diodes, is supported by both the intrinsic and extrinsic evidence. Claim 22, which is dependent on claim 21, states in relevant part "[t]he semiconductor light source as recited in claim 21 wherein: said LED chip is an LED array chip." ('961 Patent, Reexamination Certificate, 1:40–42). Plaintiff points out that if claim 21's"LED chip" did not include an LED array chip, claim 22 would not make sense. Plaintiff also directs the Court to the specification's discussion of figure 4a, which uses "LED" to describe an LED array. ('961 Patent, 4:12–21). Plaintiff contends that the presence of a Markush group in claim 1 is not fatal to its construction, as claim 21 refers to an "LED chip," not an "LED," therefore encompassing both "LED chips" and "LED array chips" from the Markush group. Moreover, Plaintiff argues that the elements within the Markush group overlap because "LED array chips are a type of LED chip." (D.I. 220 at 5).

Defendants assert that its proposed construction, which permits an LED chip to have only a single light emitting diode, is the only one supported by the intrinsic evidence. Defendants submit that the patent uses "light emitting diode" and "light emitting diode (LED) chip"

interchangeably, and therefore claim 21's "LED chip" should be construed to mean "light emitting diode," which is one of the members of claim 1's Markush group. Defendants contend that because nothing in the claim language permits "LED chip" to encompass more than one member of that Markush group, it must refer to a "light emitting diode" alone and cannot refer to an "LED array." (D.I. 219 at 1–2). Defendants claim that this construction is supported by the specification's examples of an "LED chip," which consistently include only a single light emitting diode. (See, e.g., '961 Patent, 4:29–4:63). Finally, Defendants point to the prosecution history, where Plaintiff submitted that "the single 'LED chip' of claim [31] produces roughly 3 times the light output as LEDs 4 of the LED lamps of Begemann," as evidence that, when viewed in light of the Begemann reference, claim 21 was referring to a chip with only a single light emitting diode. (D.I. 199, JX000444).

The Court agrees with Plaintiff and will adopt its construction. As an initial matter, "[c]ourt decisions construe Markush clauses as meaning 'closed' unless other language or evidence alters that meaning." Multilayer Stretch Cling Film Holdings, Inc. v. Berry Plastics Corp., 831 F.3d 1350, 1363 (Fed. Cir. 2018) (internal quotation marks and emphasis omitted). The presumption that Markush claims are closed to blends, however, is not as strong as the presumption that unlisted members of a Markush group are excluded. See id. For example, in Alcon Research, LTD. v. Watson Labs, Inc., the district court held that the Markush group was open to combinations of guar because "'guar' in this context encompasses both 'native guar' and 'hydroxypropyl guar,' as anything that is native guar or hydroxypropyl guar is also 'guar'." 2018 WL 1805530, at *5 (D. Del. Apr. 17, 2018). As in Alcon Research LTD., the evidence here suggests that a member of Markush group encompasses another member of the group. Specifically, the evidence shows that "LED array" chips are a subset of an LED chip, as claim 22 specifically refers to an "LED array

chip" as the "LED chip" selected from claim 21. Moreover, the specification describes an example of an LED array as "the LED," which is consistent with LED arrays being a subset of LED chips. Defendants' evidence does not contradict Plaintiff's proposed construction, as the specification's describing chips with a single diode as "the LED" or "LED chip" is consistent with Plaintiff's construction, which permits an "LED chip" to have one or more light emitting diodes.

Because the evidence suggests that LED chips may encompass LED array chips, thereby permitting the LED chip of claim 21 to have multiple diodes, the Court will adopt Plaintiff's proposed construction. The Court construes this term to mean "at least one LED chip is capable of emitting light greater than about 40 milliwatts."

Maryellen Noreika

The Honorable Maryellen Noreika
United States District Judge