

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

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<b>LEXINGTON LUMINANCE LLC,</b>	)	
	)	
<b>Plaintiff</b>	)	
	)	
<b>v.</b>	)	<b>Civil Action No. 12-cv-12216-DJC</b>
	)	
<b>AMAZON.COM, INC. and</b>	)	
<b>AMAZON DIGITAL SERVICES, INC.,</b>	)	
	)	
<b>Defendants.</b>	)	
_____	)	

**MEMORANDUM AND ORDER**

**CASPER, J.**

**April 4, 2016**

**I. Introduction**

Plaintiff Lexington Luminance LLC (“Lexington”) filed this lawsuit for patent infringement against Amazon.com, Inc. and Amazon Digital Services, Inc. (collectively “Amazon”) in 2012. Upon remand from the Federal Circuit, this Court reconsiders the construction of certain claim terms to U.S. Patent No. 6,936,851 (the “851 patent”). Through extensive briefing and a further Markman hearing, the parties have argued their proposed claim constructions before the Court. The Court’s claim constructions follow.

**II. Standard of Review**

Claim construction is a question of law for the court. See Markman v. Westview Instruments, Inc., 517 U.S. 370, 388-89 (1996). During that process, “the analytical focus of claim construction must begin, and remain centered, on the language of the claims themselves.” ACTV, Inc. v. Walt Disney Co., 346 F.3d 1082, 1088 (Fed. Cir. 2003). “The construction that

stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” Phillips v. AWH Corp., 415 F.3d 1303, 1316 (Fed. Cir. 2005) (quoting Renishaw PLC v. Marposs Societa’ per Azioni, 158 F.3d 1243, 1250 (Fed. Cir. 1998)). “[T]he claim terms . . . carry a presumption that ‘they mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art.’” ACTV, 346 F.3d at 1088 (quoting Tex. Digital Inc. v. Telegenix, Inc., 308 F.3d 1193, 1201-02 (Fed. Cir. 2002)). “[T]he person of ordinary skill in the art is deemed to read the claim term . . . in the context of the particular claim in which the disputed term appears . . . [and] in the context of the entire patent, including the specification.” Phillips, 415 F.3d at 1313. Finally, “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).

Importantly, “[t]he claims . . . do not stand alone.” Phillips, 415 F.3d at 1315. “[T]he claims must be read in view of the specification, of which they are a part.” Lexington Luminance LLC v. Amazon.com Inc., 601 F. App’x 963, 970 (Fed. Cir. 2015); see Phillips, 415 F.3d at 1315 (noting that “the specification ‘is always highly relevant to the claim construction analysis’”) (quoting Markman, 52 F.3d at 979). The purpose of the specification is to “teach and enable those of skill in the art to make and use the invention and to provide a best mode for doing so.” Phillips, 415 F.3d at 1323. “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess.” Id. at 1316. “[T]he specification ‘acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.’” Id. at 1321 (quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

In turn, the specification should be “informed, as needed, by the prosecution history.” Id. at 1315 (internal quotation marks omitted). The prosecution history, which “consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent” is part of the intrinsic evidence in a case. Id. at 1317. “A court should . . . consult the patent’s prosecution history” because that history “can provide further evidence of how the inventor understood the claimed invention.” Lexington, 601 F. App’x at 970. A court’s reliance upon the prosecution history, however, is not without limit: “because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes.” Phillips, 415 F.3d at 1317.

A court may also consider extrinsic evidence “if the court deems [the extrinsic evidence] helpful in determining ‘the true meaning of language used in the patent claims.’” Id. at 1318 (quoting Markman, 52 F.3d at 980). Extrinsic evidence “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” Id. at 1317 (internal quotation marks omitted). “Extrinsic evidence . . . can at times shed useful light.” Lexington, 601 F. App’x at 970. For example, expert testimony can “provide background on the technology at issue[,] . . . explain how an invention works[,] . . . 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 . . . 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, “extrinsic evidence is less significant than the intrinsic record in determining the meaning of claim language.” Lexington, 601 F. App’x at 970. Extrinsic evidence may not be “used to contradict claim meaning that is unambiguous in light of the

intrinsic evidence.” Phillips, 415 F.3d at 1324. Thus, “a court should discount any expert testimony ‘that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent.’” Id. at 1318 (quoting Key Pharms. V. Hercon Labs. Corp., 161 F.3d 709, 716 (Fed. Cir. 1998)). Courts must proceed carefully as “undue reliance on extrinsic evidence poses the risk that it will be used to change the meaning of claims in derogation of the ‘indisputable public records consisting of the claims, the specification and the prosecution history.’” Id. at 1319 (quoting Southwall Techs., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1578 (Fed. Cir. 1995)). The Federal Circuit has specifically cautioned against “adopting a construction based on general-purpose dictionaries that is inconsistent with the intrinsic record.” Lexington, 601 F. App’x at 970.

Finally, claims should not be construed to exclude any disclosed embodiments where “the claim language does not require the exclusion of those embodiments and there is no basis in the specification or prosecution history of the . . . patent for doing so.” Id. at 971. “[C]onstrutions that exclude disclosed embodiments without a clear justification are disfavored.” Id. (citing In re Katz Interactive Call Processing Patent Litig., 639 F.3d 1303, 1324 (Fed. Cir. 2011)).

### **III. Factual Background**

#### **A. The ‘851 Patent**

The factual background of this case has already been detailed by both this Court and the Federal Circuit. Lexington Luminance LLC v. Amazon.com, Inc., 6 F. Supp. 3d 179, 183-84 (D. Mass. 2014) vacated and remanded, 601 F. App’x 963 (Fed. Cir. 2015). The Court will not

repeat that background in its entirety here, focusing instead upon the facts relevant to the disputed claims regarding the ‘851 patent.

Lexington is the sole owner of the ‘851 patent entitled “Semiconductor Light-Emitting Device and Method for Manufacturing the Same.” Lexington, 6 F. Supp. 3d at 183. On December 5, 2014, the Patent Office issued a reexamination certificate for the ‘851 patent. D. 116-1 at 17, D. 118-3 at 2. The reexamination certificate modified the claim terms in certain ways, some of which are relevant here.

The ‘851 patent relates to “the fabrication of semiconductor devices such as light-emitting devices in misfit systems.” Col. 1:8-10.<sup>1</sup> A light-emitting diode (“LED”) is a semiconductor light source that is used to light various pieces of electronic equipment. D. 50 at 3, D. 115 at 5. In certain light-emitting devices, layers of crystalline semiconductor material are grown upon a crystalline substrate that has different crystal lattice constants. Col. 1:17-2:9. The atomic structures of these two layers form a matrix or “lattice” pattern, but the layers do not align perfectly and, therefore, form what the patent refers to as a “lattice mismatched system.” Id. One of the drawbacks of the mismatched system is that “the quality of the directly disposed layer is inferior due to the penetration of threading dislocations in this material system.” Id. at 1:19-22. These defects propagate in the active layer of the LED and decrease the efficacy and longevity of the device. Id. at 1:17-2:9.

The ‘851 patent is intended to address this problem by, essentially, guiding the threaded dislocations away from the active layer. Id. at 2:12-26. In technical terms, the patented invention teaches the user to “guide[]” the lattice defects such that they are “contained in designated locations,” which results in “the free propagation of extended defects . . . [being]

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<sup>1</sup> “Col. \_:\_” refers to column and line numbers for the ‘851 patent. The ‘851 patent, in both its original and amended forms, is included in the record as D. 116-1, D. 118-2 and D. 118-3.

restricted and the overall defect density of the system [being] reduced.” Id. at 1:8-15. The invention accomplishes this reduction by creating a curved surface, or “textured district[,]” atop the substrate surface. Id. As a result of this arrangement, the defects do not all go directly upward into the active layer of the LED device, as demonstrated, for example, in Figure 2A of the patent:

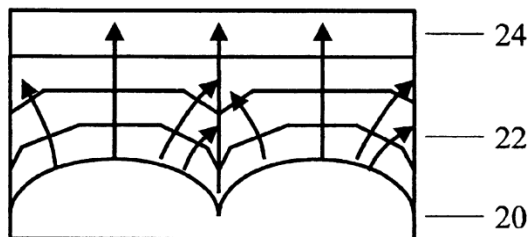


Fig. 2A

### **B. The Alleged Infringement**

Amazon markets e-reader devices and tablet computers, including the “Kindle Fire.” D. 1 ¶ 12. Lexington alleges that Amazon’s e-reader devices and tablet computers infringe the ‘851 patent. Id. Lexington alleges that “the Kindle Fire and other similar products . . . perform substantially the same function as the devices embodied in one or more claims of the ‘851 patent in substantially the same way to achieve the same result.” Id.

### **IV. Procedural History**

Lexington filed this lawsuit on November 29, 2012. D. 1. Amazon filed its answer and counterclaims, asserting an invalidity defense, D. 13 ¶ 16, and a counterclaim for a declaratory judgment that the ‘851 patent is invalid. Id. ¶¶ 15-17. Thereafter, Amazon moved for judgment on the pleadings on its invalidity defense. D. 49. After conducting a Markman hearing and reviewing both parties’ briefs, this Court found that claim 1 of the ‘851 patent suffered from indefiniteness and granted Amazon’s motion for judgment on the pleadings. See Lexington, 6 F. Supp. 3d at 194-95.

Upon review, the Federal Circuit vacated the judgment and rejected certain of the claim term interpretations this Court issued in reaching its decision on the motion for judgment on the pleadings. See Lexington, 601 F. App'x at 972. The Federal Circuit concluded that this Court “erred in finding the claim to be indefinite because of the imperfect usage of *Markush* terminology.” Id. at 969. The Federal Circuit vacated this Court’s construction of “so as to guide the extended lattice defects away from propagating into the active layer” as “such that free propagation of extended lattice defects into the active layer is significantly reduced relative to a device made by the same process without the textured districts” because that construction was adopted from the decision of another district court without independent analysis. Id. at 969. Objecting to this Court’s reliance upon general-purpose dictionaries, the Federal Circuit rejected the district court’s construction of “trenches” and instead adopted Lexington’s construction that trenches mean “areas in the surface of the substrate from which some amount of material is removed in order to create a pattern on the surface of the substrate.” Id. at 971. The Federal Circuit also rejected this Court’s construction of “having” as “consisting of” because that construction excluded the embodiments disclosed in Figures 2B and 4B. Id. at 971.

The Court found no error with the Court’s construction of “micro-facets” as “very small planar crystal surfaces.” Id. at 971. The Federal Circuit, however, vacated this Court’s construction of “sloped etching profile with a smooth rotation of micro-facets” as “when viewed in cross-section, the side and bottom walls of the etched trenches are made up of micro-facets with a gradual, incremental rotation in slope from micro-facet to micro-facet such that there are no sharp corners” and “sloped etching profile . . . without a prescribed angle of inclination” as “when viewed in cross-section, the side and bottom walls of the etched trenches have no constant angle of inclination, and so they have no linear portions” because those constructions excluded

the embodiments disclosed in Figures 2B and 4B. Id. at 972. The Federal Circuit instructed this Court to construct the terms in a manner “that does not exclude Figures 2B and 4B.” Id.

The Federal Circuit remanded for further proceedings consistent with its opinion, including further claim construction. Id. at 972. It noted that it would leave it to this Court “to determine whether the meanings of the disputed claim limitations have been altered by the reexamination history” and that, “on remand, the district court may supplement its claim constructions consistent with the controlling appellate mandates as the case moves forward.” Id. at 970 n.5

In light of the Federal Circuit’s remand and ruling, the Court held a further Markman hearing and took this matter under advisement. D. 153.

## **V. Discussion**

### **a. The ‘851 Patent**

The abstract of the patent reads:

Semiconductor light emitting device and methods for its manufacture comprises a plurality of textured district defined on the surface of the substrate. The initial inclined layer deposition serves to guide the extended defects to designated gettering centers in the trench region where the defects combine with each other. As a result, the defect density in the upper section of the structure is much reduced. By incorporating a blocking mask in the structure, the free propagation of extended defects into the active layer is further restricted. The present invention is useful in the fabrication of semiconductor light emitting devices in misfit systems.

D. 116-1 at 17, D. 118-3 at 2. Claims 1, 15 and 18 are at issue. As amended, claim 1 reads:

A semiconductor light-emitting device comprising:

a substrate;

a textured district defined on the surface of said substrate comprising a plurality of etched trenches having a sloped etching profile with a smooth rotation of micro-facets without a prescribed angle of inclination;



a first layer disposed on said textured district comprising a plurality of inclined lower portions, said first layer and said substrate form a lattice-mismatched misfit system, said substrate having at least one of a group consisting of group III-V, group IV, group II-VI elements and alloys, ZnO, spinel and sapphire; and

a light-emitting structure containing an active layer disposed on said first layer, whereby said plurality of inclined lower portions are configured to guide extended lattice defects away from propagating into the active layer.

D. 116-1 at 18, D. 118-3 at 3. Claim 15 was added during reexamination and reads:

A semiconductor light-emitting device comprising:

a substrate;

a textured district defined on the surface of said substrate comprising a plurality of etched trenches having a sloped smooth etching profile without sharp corners and without a prescribed angle of inclination;

a first layer disposed on said textured district, comprising a plurality of inclined lower portions, said first layer and said substrate form a lattice-mismatched misfit system, said substrate having at least one of a group consisting of group III-V, group IV, group II-VI elements and alloys, ZnO, spinel and sapphire; and

a light-emitting structure containing an active layer disposed on said first layer, whereby said plurality of inclined lower portions are configured to guide extended lattice defects away from propagating into the active layer.

Id. Claim 18 was also added during reexamination and reads:

The device of claim 15, wherein the sides of said etched trenches are without a prescribed angle of inclination.

Id.

**b. Undisputed Terms**

As an initial matter, the Court adopts the undisputed constructions jointly proposed by the parties. D. 137-1 at 1. These terms shall be construed as follows:

<u>Term</u>	<u>Agreed Construction</u>
Having	Including but not limited to
Disposed on	Applied directly or indirectly above

Comprising a plurality of inclined lower portions	Including one or more lower portions that are inclined relative to the overall plane of the substrate
Lattice-mismatched misfit system	A system in which a crystal layer exhibiting one lattice constant is disposed on a substrate that exhibits a different lattice constant
Group III-V . . . elements and alloys	An alloy of at least one group III element (i.e., boron, aluminum, gallium, indium, thallium, scandium, yttrium) and at least one group V element (i.e., nitrogen, phosphorous, arsenic, antimony, bismuth, vanadium, niobium, tantalum, dubnium)
Group IV . . . elements and alloys	A group IV element alone (i.e., carbon, silicon, germanium, tin, lead, titanium, zirconium, hafnium, rutherfordium), or an alloy of two or more group IV elements
Group II-VI . . . elements and alloys	An alloy of at least one group II element (i.e., beryllium, magnesium, calcium, strontium, barium, radium, zinc, cadmium, mercury, copernicium) and at least one group VI element (i.e., oxygen, sulfur, selenium, tellurium, polonium, livermorium, chromium, molybdenum, tungsten, seaborgium)
Active layer	The layer in the light-emitting device that emits the light
Layer	A thickness of material, which may be made up of sublayers, but does not refer to a substrate
Having at least one of a group consisting of group III-V, group IV, group II-VI elements and alloys, ZnO, spinel and sapphire	Including, but not limited to, at least one of the following: group III-V, group IV, group II-IV elements and alloys, ZnO, spinel, and sapphire
Substrate	The supporting material upon which the other layers of a light-emitting device are grown

Additionally, the Court incorporates those claim constructions that the Federal Circuit determined or affirmed. Both parties recognize that the Federal Circuit’s constructions must be adopted by this Court. D. 115 at 7-8, D. 118 at 5. These terms shall be construed as follows:

<u>Term</u>	<u>Court-Determined Construction</u>
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Trenches	<p>Areas in the surface of the substrate from which some amount of material is removed in order to create a pattern on the surface of the substrate. Trenches are not necessarily elongated.</p> <p><u>Lexington Luminance LLC</u>, 601 F. App’x at 971 (rejecting construction of “trenches” as “depressions bounded on the sides and bottom and open at the top” and adopting construction above)</p>
Having	<p>An open term that means claimed trenches can have, in addition to sloped areas, areas of a flat bottom as well as corners where the flat bottom and the inclined slope intersect with each other.</p> <p><u>Lexington Luminance LLC</u>, 601 F. App’x at 971 (rejecting construction of “having” as “consisting of” and making finding above in regard to the claimed trenches)</p>
Micro-facets	<p>Very small planar crystal surfaces</p> <p><u>Lexington Luminance LLC</u>, 601 F. App’x at 972 (finding “no error in the district court’s construction of ‘micro-facet’”)</p>

**c. Disputed Terms**

The Court constructs the following disputed claim terms. The Court considers the terms in the same grouping the parties employed in their Joint Claim Construction and Prehearing Statement. D. 137 at 2-3, D. 137-2.

Group 1:

<u>Term</u>	<u>Lexington’s Proposed Construction</u>	<u>Amazon’s Proposed Construction</u>
Configured to guide extended lattice defects away from propagating into the active layer  [Claims 1 & 15]	No construction necessary (plain and ordinary meaning), otherwise: shaped so as to reduce the propagation of extended lattice defects into the active layer	Shaped so as to cause all extended lattice defects to extend in a direction away from the active layer, and not to enter the active layer
Whereby said plurality of inclined lower portions are configured to guide extended lattice	Not a limitation	The phrase “whereby said plurality of inclined lower portions are” should be construed to have its plain and ordinary meaning

defects away from propagating into the active layer  [Claims 1 & 15]		
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Group 2:

<b><u>Term</u></b>	<b><u>Lexington's Proposed Construction</u></b>	<b><u>Amazon's Proposed Construction</u></b>
A sloped etching profile . . . without a prescribed angle of inclination  [Claim 1]	No construction necessary (plain and ordinary meaning), otherwise: sloped etched sides without a constant angle of inclination	When viewed in cross-section, . . . formed by an etching process wherein the angle of inclination is not controlled for
A sloped smooth etching profile . . . without a prescribed angle of inclination  [Claim 15]	No construction necessary (plain and ordinary meaning), otherwise: sloped, smooth, and etched sides without a constant angle of inclination	When viewed in cross-section, formed by an etching process wherein the angle of inclination is not controlled for
The sides of said etched trenches are without a prescribed angle of inclination  [Claim 18]	No construction necessary (plain and ordinary meaning), otherwise: the sides of said etched trenches are without a constant angle of inclination	The sides of said trenches are formed without controlling for the angle of inclination

Group 3:

<b><u>Term</u></b>	<b><u>Lexington's Proposed Construction</u></b>	<b><u>Amazon's Proposed Construction</u></b>
A sloped etching profile with a smooth rotation of micro-facets  [Claim 1]	No construction necessary (plain and ordinary meaning), otherwise: sloped etched sides without sharp corners	When viewed in cross-section, a gradual incremental rotation in slope from micro-facet to micro-facet such that there are no sharp corners formed by an etching process

In their post-remand Markman briefing, the parties agree upon a portion of this claim term. D. 115 at 24, D. 118 at 17. Since the agreement only pertains to a portion of the claim term, the Court will conduct its own analysis of the term. The Court, nonetheless, notes the apparent agreement:

<u>Term</u>	<u>Agreed Construction</u>
Smooth rotation of micro-facets	Refers, in part, to an absence of sharp corners in the trench's profile; indicative of the absence of sharp corners

The Court addresses each of the disputed claim terms in turn.

**I. Group 1**

1. *“Configured to guide extended lattice defects away from propagating into the active layer”*

<u>Term</u>	<u>Lexington’s Proposed Construction</u>	<u>Amazon’s Proposed Construction</u>
Configured to guide extended lattice defects away from propagating into the active layer  [Claim 1 & 15]	No construction necessary (plain and ordinary meaning), otherwise: shaped so as to reduce the propagation of extended lattice defects into the active layer	Shaped so as to cause all extended lattice defects to extend in a direction away from the active layer, and not to enter the active layer

The parties’ dispute regarding this set of claim terms turns upon the extent to which the patent must accomplish its goal of addressing the propagation of extended lattice defects into the active layer. Amazon argues that the patent must “prevent” the propagation of extended lattice defects arising from the inclined lower portions into the active layer. D. 115 at 16. Lexington argues that the patent must “reduce” the propagation of extended lattice defects into the active layer. D. 118 at 23.

The patent makes clear that its goal is reduction. See e.g., Col 1:8-15, 2:12-25, 3:43-46, 5:6-11. The Federal Circuit described the ‘851 patent in the following manner: “the ‘851 patent teaches using a substrate that has a ‘textured surface district’ in order to direct lattice defects to the sides and to reduce the defect density in the active layer.” Lexington, 601 F. App’x at 965. As such, the Federal Circuit articulated that the purpose of the invention is to “reduce” the defect density. Id. There is no requirement that the technology eliminate the defect density or address any particular subset of the extended lattice defects. See id.; see also Feit Elec. Co., Inc., No. 12-cv-11554-WGY, D. 50 at 24 (transcript of June 25, 2013 Markman hearing in which the court adopted a construction of this claim term “‘that serves the purpose of minimizing the propagation of lattice defects into the active layer.’ I mean, that’s the goal [of the invention]”).

This Court has already rejected Amazon’s attempts to cast doubt upon the patent’s goal of reduction. In response to Amazon’s pre-remand argument that the ‘851 patent was indefinite because the patent did not specify exactly which defects were reduced, this Court explained that “the invention teaches here that guiding the defects away from the active layer simply means that they are reducing them as much as possible.” Lexington, 6 F. Supp. 3d at 192. The Federal Circuit agreed, explicitly noting that the patent was not deficient for failing to establish how many defects were reduced. See Lexington, 601 F. App’x at 969 (noting “agree[ment] with the district court that the claim is not indefinite for not specifying ‘exactly how many defects [were] reduced’”) (alteration in original).

A person skilled in the art would understand that “configured to guide extended lattice defects away from propagating into the active layer” requires only a reduction in defect density. Furthermore, “[b]ecause the ordinary meaning of [this phrase would be] clear to a jury, the term does not require construction.” Koninklijke Philips Elecs. N.V. v. Zoll Med. Corp., 914 F. Supp.

2d 89, 95 (D. Mass. 2012). In the pre-remand claim construction proceedings, both parties initially proposed that no construction of this term was necessary. D. 67-2 at 7.<sup>2</sup> While the term was modified slightly in the recertification process, Amazon concedes that prior analysis of the term applies with “equal force to the post-reexamination term as to the pre-reexamination one.” D. 115 at 8 n.2. For all of these reasons, the Court concludes that there is no need for construction of this claim term.

Amazon’s proposed construction rests upon an unsupported requirement that all of the extended lattice defects arising from the inclined lower portions must be guided away or “annihilated.” D. 162 at 39. There is no support in the intrinsic evidence for such an exacting requirement – a requirement, moreover, that would be contrary to the Federal Circuit’s determination that the overall goal of this patent is reduction of defect density. In support of its reading, Amazon points, *inter alia*, to the fact that the phrase “inclined lower portions . . . are configured to guide extended lattice defects away” has a subject of “inclined lower portions” and verb of “guide.” D. 115 at 12. Amazon stresses that “the claim does not attach any qualifier to the . . . object [of the verb],” namely the “extended lattice defects” and takes that to mean every single extended lattice defect arising through the inclined portions must be guided away. *Id.* Amazon correctly notes that the object “inclined lower portions” does not have a modifier; in the same stroke, however, Amazon fails to recognize that its proposal would read in the modifier “all” or “every” without providing any support for that insertion. See Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 989 (Fed. Cir. 1999) (holding that “modifiers will not be added to broad terms standing alone”).

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<sup>2</sup> Amazon argued that “[t]he term ‘the extended lattice defects’ is indefinite.” D. 67-2 at 7. That argument has been rejected by both this Court and the Federal Circuit. See Lexington, 6 F. Supp. 3d at 192; see also Lexington, 601 F. App’x at 969. Then, in relevant part, Amazon asserted that “[n]o construction is required for the remainder of this term.” D. 67-2 at 7.

Amazon’s reliance upon the figures fails for the same reason: while Amazon is correct that the figures depict inclined lower portions shaped so as to guide the propagation of extended lattice defects, D. 115 at 13, the figures do not require that the inclined lower portions are always and completely effective in preventing the extended lattice defects that arise from the inclined lower portions from reaching the active layer. Amazon’s reliance upon the Summary of the Invention and the expert testimony, D. 115 at 15-16, suffers from the same deficiency.

2. *“Whereby said plurality of inclined lower portions are configured to guide extended lattice defects away from propagating into the active layer”*

<u>Term</u>	<u>Lexington’s Proposed Construction</u>	<u>Amazon’s Proposed Construction</u>
<p>Whereby said plurality of inclined lower portions are configured to guide extended lattice defects away from propagating into the active layer</p> <p>[Claim 1 &amp; 15]</p>	<p>Not a limitation</p>	<p>The phrase “whereby said plurality of inclined lower portions are” should be construed to have its plain and ordinary meaning</p>

As an initial matter, the parties dispute the propriety of Lexington raising this claim term for the first time in its reply brief. Neither party included this term in its opening claim construction brief. D. 115, D. 118. During the Markman hearing, Amazon noted the belated nature of Lexington’s identification of this phrase as a disputed claim term. See e.g., D. 162 at 41. Amazon received notice of Lexington’s intention to raise this argument nearly two months before the Markman hearing, however, and Amazon had ample opportunity to respond to the



argument.<sup>3</sup> Amazon addressed this claim term and the related arguments during the Markman hearing. Id. at 41-44, 49-50. Accordingly, finding no prejudice to Amazon and for the sake of completeness, the Court will address this disputed term.

The whereby clause has three essential parts. The clause contains the language “plurality of inclined lower portions.” The parties do not dispute the construction of those terms. D. 137-1 at 1. Another portion of the whereby clause – “configured to guide extended lattice defects away from propagating into the active layer” – has been identified separately as a disputed term and this Court has determined that construction of that term is not necessary. Thus, the question this argument raises is whether the preceding words – “whereby said” – require the Court to find that the phrase “configured to guide extended lattice defects away from propagating into the active layer” is no longer a limitation.

In Lexington’s view, the “whereby” clause strictly states the intended result of the limitations in the claim and so no part of the “whereby” clause is a limitation. D. 133 at 9. Lexington relies extensively upon a line of cases holding that “[a] ‘whereby’ clause that merely states the result of the limitations in the claim adds nothing to the patentability or substance of the claim.” Texas Instruments Inc. v. U.S. Int’l Trade Comm’n, 988 F.2d 1165, 1172 (Fed. Cir. 1993); see Titan Atlas Mfg. Inc. v. Sisk, 894 F. Supp. 2d 754, 763 (W.D. Va. 2012) (stating the same proposition); Lockheed Martin Corp. v. Space Sys./Loral, Inc., 324 F.3d 1308, 1319 (Fed. Cir. 2003) (stating the same proposition).

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<sup>3</sup> In its reply brief, Lexington noted that it “advised Defendants on August 17, 2015 that, due to the unanticipated positions taken by Defendants, the phrase including the preceding words ‘whereby said plurality of inclined lower portions are’ were also in dispute. Ex. K. On August 31, 2015, Lexington provided its proposed construction to Defendants, asked for Defendants’ proposed construction, and offered Defendants a surreply to obviate any potential prejudice. Exs. L-O. Defendants have thus had an opportunity to fully address the dispute, which must be resolved by the Court.” D. 133 at 8 n.2.

The Court disagrees. In assessing whether a clause serves only to state a result such that the clause does not constitute a limitation, the mere use of the word “whereby” is not determinative. See Hoffer v. Microsoft Corp., 405 F.3d 1326, 1329 (Fed. Cir. 2005) (holding that the whereby clause before it was a limitation); see also Scheinman v. Zalkind, 112 F.2d 1017, 1019 (C.C.P.A. 1940) (same); Biosig Instruments, Inc. v. Nautilus, Inc., 783 F.3d 1374, 1383 (Fed. Cir. 2015) (noting that the whereby clause before it described an essential function of the patent) (citing Hoffer, 405 F.3d at 1329). Instead, “when the whereby clause states a condition that is material to patentability, it cannot be ignored in order to change the substance of the invention.” Hoffer, 405 F.3d at 1329 (internal quotation marks omitted). The reasoning in Hoffer is illustrative. In Hoffer, the Federal Circuit’s decision that the whereby clause was a limitation turned upon the fact that the capability described in the whereby clause was “more than the intended result of a process step; it [was] part of the process itself.” Id. at 1330. The capability was “described in the specification and prosecution history as an integral part of the invention.” Id.

The Court concludes that the whereby clause here constitutes a limitation because the clause establishes the structure by which reduction in defect density is achieved. As discussed above, the goal of this invention is to reduce density defect in the active layer. See e.g., Col 1:5-15, 2:18-25, 3:43-46, 5:6-11; see also Lexington, 601 F. App’x at 965. The whereby clause not only states that goal, but also establishes the structure that causes the reduction in defect density. The structural element of the whereby clause is the portion stating that the “plurality of inclined lower portions are configured.” The term “configured” connotes shape and structure. That portion of the clause specifies the structure and shape of the inclined lower portions. That structure and shape in turn facilitates the movement of extended lattice defects away from

propagating into the active layer. As such, the configuration of the inclined lower portions is “more than the intended result of a process step.” Hoffer, 405 F.3d at 1330. The distinct shape and structure of the inclined lower portions constitute a “part of the process” that results in reduced defect density. Id. Because the clause serves a greater function than merely stating the result of the limitations, the cases upon which Lexington relies are inapposite. Here, the whereby clause as a whole is “an integral part of the invention” and constitutes a limitation. Id.

Moreover, during reexamination of the ‘851 patent, Lexington represented that the addition of the word “whereby” did not change the scope of the claim. See reexamination file history at LEX 002810 (noting that Lexington was “amending the claims to more particularly recite the claim limitation as a feature of the light-emitting structure”).<sup>4</sup> Lexington made that representation for good reason: 35 U.S.C. § 305 prohibits the expansion of claims during reexamination. See Quantum Corp. v. Rodime, PLC, 65 F.3d 1577, 1581-82 (Fed. Cir. 1995); see also Creo Prods., Inc. v. Presstek, Inc., 305 F.3d 1337, 1344 (Fed. Cir. 2002) (holding that “patentee[s] [are] not permitted to enlarge the scope of a patent claim during reexamination”). “Whether amendments made during reexamination enlarge the scope of a claim is a matter of claim construction” to be resolved by the Court. Creo Prods., Inc., 305 F.3d at 1344 (citing Hockerson–Halberstadt, Inc. v. Converse Inc., 183 F.3d 1369, 1373 (Fed. Cir. 1999)).

In the amended ‘851 patent, the disputed language that follows “whereby” – “configured to guide extended lattice defects away from propagating into the active layer” was added in the reexamination process. D. 116-1 at 18;D. 118-3 at 3. A phrase in the original patent that was deleted as to an earlier clause in Claim 1 as this disputed language was added to the last clause of Claim 1 was “so as to guide the extended lattice defects away from propagating into the active

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<sup>4</sup> On October, 15, 2015, Amazon manually filed with this Court a CD-ROM containing the reexamination file history of U.S. Patent No. 6,936,851. D. 156.

layer.” *Id.* “[S]o as to guide the extended lattice defects away from propagating into the active layer,” as it appeared in the original patent, was not a part of any whereby clause. As it appeared in the original patent, the phrase constituted a limitation. Because Lexington represented that the addition of the word “whereby” did not change the scope of the claim, it certainly follows that the substantially similar phrase, in its recertified form, constitutes a limitation. For this reason as well, the phrase “whereby said plurality of inclined lower portions are configured to guide extended lattice defects away from propagating into the active layer” in the amended patent ‘851 is a limitation and the use of the word “whereby” does not erase the limiting effect of the language that follows the word.

**II. Group 2**

3. “*A sloped etching profile . . . without a prescribed angle of inclination*”

<u><b>Term</b></u>	<u><b>Lexington’s Proposed Construction</b></u>	<u><b>Amazon’s Proposed Construction</b></u>
A sloped etching profile . . . without a prescribed angle of inclination  [Claim 1]	No construction necessary (plain and ordinary meaning), otherwise: sloped etched sides without a constant angle of inclination	When viewed in cross-section, . . . formed by an etching process wherein the angle of inclination is not controlled for

*a. A sloped etching profile*

A central difference between the parties’ proposed constructions of this term is whether “etching” is two-dimensional, as Amazon contends, or three-dimensional, as Lexington contends. D. 115 at 22; D. 118 at 9-10. The Court concludes that “etching” is three-dimensional. During its review of this case, the Federal Circuit noted:

According to the ‘851 patent, trenches are formed by etching away certain material from the surface of the substrate, leaving behind three-dimensional

surface features, which the patent describes in the alternative as “stripe” or “mesa.”

Lexington, 601 F. App’x at 971. To be capable of creating the “three-dimensional surface features” that the Federal Circuit described, “etching” must itself be three-dimensional. The intrinsic evidence also supports this construction of “etching.” The language of the patent repeatedly suggests that “etching” leaves three-dimensional impressions. For example, the patent explains that “the masked substrate is directly dipped in an isotropic etchant to produce trenches with a curved etching profile.” Col. 4:21-23. Similarly, the patent describes how “[t]he wafer is then subjected to isotropic etching to render a smooth etching profile suitable for layer deposition.” Id. at 5:53-55.

As “etching” modifies “profile,” the three-dimensional nature of “etching” must extend to profile. Claim terms must be interpreted according to their context. See Phillips, 415 F.3d at 1313; see also Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1311 (Fed. Cir. 1999).

The Court constructs “profile” to mean “sides” because the term carries that meaning to a person of ordinary skill in this field. Moreover, the disclosed embodiments of the invention show that the sloped portion of the etching profile constitutes the sides. D. 116-1 at 4-10, D. 118-2 at 4-10. Thus, taken together, the Court constructs “sloped etching profile” to mean “sloped etched sides.”

Amazon’s proposal is inconsistent with the Federal Circuit’s suggestion about the nature of the result of “etching” being three-dimensional and the Federal Circuit’s requirement that the terms must be construed so as not to exclude the figures. In Amazon’s view, “[t]he patent’s use of the term ‘profile,’ combined with its repeated depiction of cross-sectional views in illustrating the relevant features, plainly defines this term to require a cross-section.” D. 115 at 24. In the portions of the patent Amazon cites for support, the patent is describing the figures as “cross-

sectional view[s].” See e.g., Col. 2:59, 2:64, 3:1, 3:11, 3:26-27. The use of “cross-sectional” in that context is simply a description of the view. It does not establish the meaning that is intended where “profile” is used in different contexts elsewhere in the patent. Additionally, the term at issue is “sloped etching profile.” The modifiers “sloped” and “etching” are essential to understanding the term as the term fits within the purpose of the invention. The modifiers cannot be disregarded because “claims are interpreted with an eye toward giving effect to all terms in the claim.” Bicon, 441 F.3d at 950.

*b. “Without a prescribed angle of inclination”*

Both the intrinsic and extrinsic evidence support construing “prescribed” to mean “specified.” Given that the extrinsic evidence as to this term is consistent with its intrinsic evidence, it is proper for the Court to rely upon the extrinsic evidence. See Lexington, 601 F. App’x at 970. According to Lexington, the dictionary definition of “prescribed” is “to set down as a rule or direction; order; ordain; direct.” D. 118-11 at 5. Based upon the dictionary definition, Lexington suggests that an acceptable construction of “prescribed” in the context of this patent is “specified.” D. 118 at 20. The dictionary definition Amazon presents in support of its proposed construction of “prescribed” includes “specify.” D. 116-2 at 4. Moreover, the Court finds that “specified” fits the usages of “prescribed” throughout the patent. For example, the patent reads, “the direction of inclined layer growth is not uniquely prescribed by mesa etching.” Col 3:37-39. Similarly, the patent reads, “[i]n contrast to the prior art methods, there is no prescribed plane for the layer to grow.” Id. at 4:62-63. “Specified” is also consistent with the disclosed embodiments. D. 116-1 at 4-10, D. 118-2 at 4-10.

Amazon’s proposed construction fails because it introduces a new term without any intrinsic support; it excludes certain disclosed embodiments; and it does not account for every

word in the claim. First, the intrinsic evidence provides no support for the requirement in Amazon's proposed construction that "the angle of inclination is not controlled for." The Court "will not read [that kind of] unstated limitation[] into claim language." N. Telecom Ltd. v. Samsung Elecs. Co., 215 F.3d 1281, 1290 (Fed. Cir. 2000). Amazon cites to, *inter alia*, its expert witness to reach the conclusion that its proposed construction is "consistent with the interpretation of one of ordinary skill in the art." D. 115 at 19-20. While expert testimony "can at times shed useful light," a single expert's testimony, much like any other single piece of extrinsic evidence, does not establish the meaning of a term. Lexington, 601 F. App'x at 970. Second, the disclosed embodiments do not support Amazon's proposed construction. The disclosed embodiments depict various angles of inclination along the curve of the slopes. The Court declines to construct the claim terms in a manner that would exclude multiple embodiments. See Lexington, 601 F. App'x at 971 (noting that claims should not be construed to exclude disclosed embodiments where "the claim language does not require the exclusion of those embodiments"). Third, Amazon's proposed construction does not account for the word "prescribed" in the claim. Adoption of Amazon's proposed construction would violate the principle that "claims are interpreted with an eye toward giving effect to all terms in the claim." Bicon, 441 F.3d at 950.

Accordingly, the Court constructs "a sloped etching profile . . . without a prescribed angle of inclination" to mean "sloped etched sides without a specified angle of inclination." Furthermore, "etching" is three-dimensional.

4. “A sloped smooth etching profile . . . without a prescribed angle of inclination”

<u>Term</u>	<u>Lexington’s Proposed Construction</u>	<u>Amazon’s Proposed Construction</u>
A sloped smooth etching profile . . . without a prescribed angle of inclination  [Claim 15]	No construction necessary (plain and ordinary meaning), otherwise: sloped, smooth, and etched sides without a constant angle of inclination	When viewed in cross-section, formed by an etching process wherein the angle of inclination is not controlled for

This claim term contains a number of terms that have already been construed by this Court or the Federal Circuit. Those constructions stand in this context as well. See Phillips, 415 F.3d at 1314 (noting that “claim terms are normally used consistently throughout the patent”). For all of the reasons discussed above, the Court rejects Amazon’s proposed construction involving “cross-section” and “the angle of inclination is controlled for.” Accordingly, the only term here that remains for construction is “smooth.” The Court concludes that a person skilled in the art would assign “smooth” its plain and ordinary meaning. Furthermore, the “ordinary meaning of [this phrase will be] clear to a jury.” Koninklijke, 914 F. Supp. 2d at 95. Construction is not necessary. In sum, the Court constructs “a sloped smooth etching profile . . . without a prescribed angle of inclination” to mean “a sloped smooth etched side without a specified angle of inclination.”

5. “The sides of said etched trenches are without a prescribed angle of inclination”

<u>Term</u>	<u>Lexington’s Proposed Construction</u>	<u>Amazon’s Proposed Construction</u>
The sides of said etched trenches are without a prescribed angle of inclination	[No construction necessary (plain and ordinary meaning)], otherwise: the sides of said etched trenches are without a constant angle of inclination	The sides of said trenches are formed without controlling for the angle of inclination



[Claim 18]		
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Both parties submit that “the side of said trenches” does not need to be constructed. D. 137-2 at 7. The court agrees and declines to construct “the side of said trenches.” See Koninklijke, 914 F. Supp. 2d at 95 (holding that a term whose definition was clear to the jury did not require construction). The Court rejects the language “controlling for the angle of inclination” in Amazon’s proposal for the same reasons the Court rejected Amazon’s proposal of “the angle of inclination is not controlled for.” The Court, therefore, construes “the sides of said etched trenches are without a prescribed angle of inclination” to mean “the sides of said etched trenches are without a specified angle of inclination.”

**III. Group 3**

6. “A sloped etching profile with a smooth rotation of micro-facets”

<u>Term</u>	<u>Lexington’s Proposed Construction</u>	<u>Amazon’s Proposed Construction</u>
A sloped etching profile with a smooth rotation of micro-facets  [Claim 1]	[No construction necessary (plain and ordinary meaning)] otherwise: sloped etched sides without sharp corners	When viewed in cross-section, a gradual incremental rotation in slope from micro-facet to micro-facet such that there are no sharp corners formed by an etching process

This term can effectively be considered in two parts: 1) “sloped etching profile” 2) “with a smooth rotation of micro-facets.” The Court has already constructed “sloped etching profile” to mean “sloped etched sides.” As previously noted, the parties agree that a “smooth rotation of micro-facets” involves the absence of sharp corners. D. 115 at 24, D. 118 at 8. Because Lexington’s proposed construction is consistent with the intrinsic evidence, and consistent with the Court’s construction of “sloped etched profile,” the Court adopts it. Amazon’s construction

includes a series of details that are not compelled by the intrinsic evidence and that are likely to needlessly confuse the jury. In sum, the Court constructs “sloped etching profile with a smooth rotation of micro-facets” to mean “sloped etched sides without sharp corners.”

## **VI. Conclusion**

For the foregoing reasons, the disputed claim terms are construed as follows:

1. The term “whereby said plurality of inclined lower portions are configured to guide extended lattice defects away from propagating into the active layer” constitutes a limitation and does not require any construction;
2. The term “a sloped etching profile . . . without a prescribed angle of inclination” means “sloped etched sides without a specified angle of inclination” and the term “etching” is three-dimensional;
3. The term “a sloped smooth etching profile . . . without a prescribed angle of inclination” means “a sloped smooth etched side without a specified angle of inclination;”
4. The term “the sides of said etched trenches are without a prescribed angle of inclination” means “the sides of said etched trenches are without a specified angle of inclination;” and
5. The term “a sloped etching profile with a smooth rotation of micro-facets” means “sloped etched sides without sharp corners.”

**So Ordered.**

/s/ Denise J. Casper  
United States District Judge