Neev v. Alcon Lensx, 8:15-cv-0624-JVS-JCG
consolidated with 15-cv-01538-JCVS

8:15-cv-1551-JVS-JCG
consolidated with 8:15-cv-00336-JVS-JCG

TENTATIVE ORDER ON CLAIM CONSTRUCTION

Plaintiffs Joseph Neev ("Dr. Neev") and Lawrence Livermore National Security, LLC ("Lawrence Livermore") and Defendants Alcon Lensx, Inc., Alcon Laboratories, Inc. and Wavelight, GMBH (collectively "Alcon") and Abbot Medical Optics Inc. ("Abbott"), Carl Zeiss Medite Inc. ("Carl Zeiss"), and Lensar Inc. ("Lensar"), (collectively "Track Two Defendants") have submitted proposed claim constructions for thirteen terms across three patents. Joint State. Docket No. 101. The parties have submitted opening and responsive claim construction briefs. Pl.s' Opening Br., Docket No. 113; Def.s' Opening Br., Docket No. 89; Pl.s' Responsive Br., Docket No. 118; Def.s' Responsive Br., Docket No. 117. The Court has considered the parties' briefs and construes the relevant claim language below.

BACKGROUND

This dispute's background is familiar to the parties and to the Court. The following three patents are currently at issue; (1) U.S. Patent No. 5,720,894 ("the '894 Patent"); (2) U.S. Patent No. 6,482,199 ("the '199 Patent"); and (3) U.S. Patent No. 8,523,926 ("the '926 Patent"). The parties now ask the Court to construe thirteen terms involving three patents.

LEGAL STANDARD

Claim construction is "exclusively within the province of the court." Markman v. W. Instruments, Inc., 517 U.S. 370, 372 (1996). Such construction "must begin and remain centered on" the claim language itself. Interactive Gift Express, Inc. v. Compuserve, Inc., 256 F.3d 1323, 1331 (Fed. Cir. 2001). But extrinsic evidence may also be consulted "if needed to assist in determining the meaning or scope of technical terms in the claims." Pall Corp. v. Micron Separations, Inc., 66 F.3d 1211, 1216 (Fed. Cir. 1995).

In construing the claim language, the Court begins with the principle that "the words of a claim are generally given their ordinary and customary meaning." Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (internal quotation marks omitted). This ordinary and customary meaning "is the meaning that the [claim] 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." Id. at 1313. "[T]he person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." Id.

"In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words. In such circumstances general purpose dictionaries may be helpful." Id. at 1314 (internal citation omitted). In other cases, "determining the ordinary and customary meaning of the claim requires examination of terms that have a particular meaning in a field of art." Id. Then "the court looks to those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean." Id. (internal quotation marks omitted). These sources include "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." Id. (internal quotation marks omitted).

But it is improper to read limitations from the specification into the claim. Callicrate v. Wadsworth Mfg., Inc., 427 F.3d 1361, 1368 (Fed. Cir. 2005) ("[I]f we once begin to include elements not mentioned in the claim, in order to limit such claim . . . we should never know where to stop.") (quoting Phillips, 415 F.3d at 1312). A court does "not import limitations into claims from examples or embodiments appearing only in a patent's written description, *even when a specification describes very specific embodiments of the invention* or even describes only a single embodiment, unless the specification makes clear that 'the patentee . . . intends for the claims and the embodiments in the specification to be strictly coextensive.'" JVW Enters., Inc. v. Interact Accessories, Inc., 424 F.3d 1324, 1335 (Fed. Cir. 2005) (internal citations omitted) (italics added).

CLAIM CONSTRUCTION

The Court construes a total of thirteen terms across three patents, including (1) six terms in the ’894 Patent, which is owned by Lawrence Livermore; (2) five terms in the ’199 Patent, which is owned by Dr. Neev; and (3) two terms in ’926 Patent, which is owned by Dr. Neev.[1]

I. ’894 PATENT

The ’894 Patent is a “method and apparatus . . . for fast, efficient, precise and damage-free biological tissue removal using an ultrashort pulse duration laser system operating at high pulse repetition rates.” Prendergast Decl. Ex. A,’894 Patent, Docket No. 113-1 at

A. “Substantially no collateral damage.”

Claim 1 recites the following:

> repeating said plasma formation step at a pulse repetition rate greater than 10 pulses per second until a sufficient depth of material has been removed with substantially no transfer of thermal or mechanical energy into the remaining material and *substantially no collateral damage* thereto.

’894 Patent 16:48–53. (italics added). Claim 11 also states:

> each successive pulse forming an additional plasma until a sufficient amount of material has been removed with substantially no transfer of thermal or mechanical energy into the remaining material and *substantially no*

[1] Although Plaintiffs submitted joint briefing, Dr. Neev does not join Lawrence Livermore’s construction of ’894 Patent and Lawrence Livermore does not join Dr. Neev’s constructions of the ’199 Patent and the ’894 Patent. Pl.s’ Opening Br. at 1, n.1, Docket No. 113. Lensar takes no position on claim construction for the terms at issue in ’199 Patents and the ’926 Patents. Def.s’ Opening Br. at 5, n.2. Similarly, Abbott and Zeiss do not take a position on ther terms at issue in ’926 Patent. Id.

collateral damage thereto.

'894 Patent 17:28–35 (italics added).

Lawrence Livermore's Construction	**Alcon's Construction**	**Track Two Defendants' Construction**
Substantially no: No construction necessary; plain meaning Alternatively: without resulting in extensive [collateral damage] Collateral damage: unintended injury, such as cracks, material charring, discoloration, surface melting and perceived pain	Substantially no Collateral damage: indefinite.	Substantially no: no measurable Collateral damage: indefinite

1) The term "collateral damage" is not indefinite.

A patent specification must "conclude with one or more claims *particularly pointing out and distinctly claiming* the subject matter which the applicant regards as [the] invention." Nautilus, Inc. v. Biosig Instruments, Inc., 134 S. Ct. 2120, 2124 (2014) (hereinafter "Nautilus II") (quoting 35 U.S.C. § 112(b)) (italics in original). Courts evaluate definiteness from "the perspective of someone skilled in the relevant art . . . at the time the patent was filed" and "in light of the patent's specification and prosecution history." Id, This requires a "delicate balance": although "some modicum of uncertainty" is permissible, "a patent must be precise enough to afford clear notice of what is claimed." A patent is not definite just because "a court can ascribe some meaning a patent's claims" — instead, "[t]he claims . . . must provide objective boundaries." Interval Licensing LLC v. AOL, Inc., 766 F.3d 1364, 1371 (Fed. Cir. 2014) (italics omitted) (internal quotations

omitted).

Defendants argue that the phrase "substantially no collateral damage" is indefinite because a person of skill in the art lacks sufficient guidance to determine what counts as "collateral damage" or what level of damage would be considered "substantially no collateral damage." Def.s' Opening Br. at 7. Lawrence Livermore argues that the phrase "substantially no" does not require construction because its use is consistent with its plain and ordinary meaning. Pl.s' Opening Br. at 6. Lawrence Livermore also argues that the term "collateral damage" is not indefinite because the specification distinguishes intended damage to the target area, which removes material, from collateral damage — unintended harm to the surrounding area. Pl.s' Responsive Br. at 1. Therefore, collateral damage consistently means harm incidental to that necessary for material removal. Id. at 2.

The term "collateral damage" is not indefinite. The specification shows that the '894 Patent's major purpose was to reduce collateral damage. For instance, the specification repeatedly describes the problem with high intensity pulses, such as "very loud acoustic snaps" and "thermal damage[.]" '894 Patent 2:18–42. It also states that "UV excimer lasers" cause "considerable thermal and mechanical collateral damage[.]" Id. 2:59–3:18; see also 6:39–43 (previous lasers failed to "remove substantial amounts of tissue without causing extensive collateral damage."). After repeatedly describing these problems, the specification explains that the '894 Patent "results in negligible collateral mechanical damage . . .[and] minimal collateral thermal damage." Id. 5:54–58; see, e.g., id. 8:15 (patent causes "negligible diffusion induced collateral damage" and reduces "the amount of collateral damage caused in a material as a result of laser-material interaction.").

Therefore, because the '894 Patent intended to reduce collateral damage, the Court should construe the claim in a way that does not negate its major purpose. NEC Corp. v. Hyundai Elecs. Indus. Co., 30 F. Supp. 2d 546, 553 (E.D. Va. 1998) (quoting CVI/Beta Ventures, Inc. v. Tura LP, 112 F.3d 1146, 1160 (Fed. Cir. 1997)) ("[T]he purpose of the invention may guide claim construction since 'the problem the inventor was attempting to solve, as discerned from the specification and prosecution history, is a relevant consideration' in construing claims."); see also Chrisha Creations, Ltd. v. Dolgencorp, Inc., 817 F. Supp. 2d 363, 368 (S.D.N.Y. 2011) (rejecting a construction that would not serve the inventor's

stated purpose).

Defendants argue that the term is indefinite because it does not provide enough guidance for someone to determine what might be collateral damage in a specific context. Def.s' Br. at 8. Defendants rely on the expert testimony of Dr. Majoribanks, who states that the phrase is indefinite because its meaning will vary across applications and users. Marjoribanks' Decl. ¶¶ 73–78.

But — while the specific type of collateral damage may vary across any given procedure — the term's meaning does not. The claims and the specification consistently use "collateral damage" to describe damage that occurs to the material surrounding the target area — not damage to the target area itself. First, the claim states that there is no energy transfer into the "surrounding material" and" substantially no collateral damage thereto." '894 Patent 16:50–53; see also 17:33–35 (same language). The claim's use of "thereto" links "collateral damage" with "surrounding material." In the specification, each description of collateral damage likewise discusses the surrounding area — not the target itself. For instance, it states that, in prior lasers, energy would propagate "through the *surrounding tissue* as both mechanical shock waves and heat which manifest themselves as undesirable cracks, material charring, discoloration, surface melting and perceived pain." '894 Patent 6:49–52 (emphasis added). Likewise, the specification describes how excimer lasers produce "scattered radiation" that can "interact with the *ambient environment*" to damage tissue. Id. 3:24–30 (emphasis added). The Summary of Invention discusses collateral damage in a similar manner. Id. 4: 2–7 (plasma formation removes tissue with "substantially no transfer of thermal or mechanical energy into the *remaining tissue* and substantially no collateral damage thereto"); 8:6–12 ("little energy transfer into the material bulk" because damage occurs only in the irradiated area); 14:23–26 ("substantially no collateral damage to *surrounding material*") (emphasis added). Therefore, the term collateral damage is not indefinite.

Turning to proposed constructions, Lawrence Livermore argues that "collateral damage" means "unintended injury, such as cracks, material charring, discoloration, surface melting and perceived pain." Defendants argue that this proposed construction improperly imports subjective opinion into the claim. Def.s' Opening Br. at 11. Lawrence Livermore argues in response that this definition is not subjective because "if it is harmful and if it is not at the target, it is collateral

damage." Pl.s' Responsive Br. at 6. This response exposes the flaw in Lawrence Livermore's proposed construction: the proper measure of collateral damage is the target area itself — not the operator's intentions. Again, the specification and claims repeatedly emphasize that the collateral damage occurs to the surrounding area. See, e.g., '894 Patent 3:24–30; 6:49–52; 16:50–53;17:33–35. Hence, the construction should likewise focus on the area surrounding the target.

In sum, the final construction for "collateral damage" is "damage to the area surrounding the desired area of removal (target area), including, but not limited to, undesirable cracks, material charring, discoloration, surface melting and perceived pain."

2) The term "substantially no" is not indefinite.

Defendants next argue that the phrase "substantially no" is also indefinite because it provides no guidance to determine what level of collateral damage is within the claim's limitations. Def.s' Br. at 9.

But for a term of degree, "absolute or mathematical precision" is unnecessary. Interval Licensing, 766 F.3d at 1370; see also Verve, LLC v. Crane Cams, Inc., 311 F.3d 1116, 1120 (Fed. Cir. 2002) ("It is well established that when the term 'substantially' serves reasonably to describe the subject matter so that its scope would be understood by persons in the field of the invention, and to distinguish the claimed subject matter from the prior art, it is not indefinite."). Instead, the claim only needs to "provide objective boundaries for those of skill in the art." Id. at 1371.

Plaintiffs argue that '894 Patent creates an objective boundary because it contrasts the claimed "substantially no collateral damage" with the "extensive" collateral damage caused by prior art. Pl.s' Responsive Br. at 7.

Plaintiffs are correct: the term is not indefinite because the specification defines the term by reference to the collateral damage levels caused by prior art. The specification repeatedly describes the damage caused by "UV excimer lasers," "such as those operating at a pulse repetition above three to five Hertz." '894 Patent 3:7–34. Likewise, it states that "previously known and used long pulse laser systems, operating in the nanosecond to microsecond pulse duration regime"

caused "extensive collateral damage." Id. 6:39–43. It further states that the Patent reduces collateral damage through "pulse durations less than the characteristics electron-lattice energy transfer time . . . of about 10 to 50 picoseconds." Id. 7:9–12. Finally, the specification lists numerous types of collateral damage; therefore someone skilled in the art would know which effects the Patent would minimize. See 6:49–52 (listing examples of collateral damage).

Furthermore, Figure 4 exemplifies the distinction between these levels of collateral damage. Figure 4 concerns temperature increases — one potential cause of collateral damage. Id. 6:49–52 (heat can cause collateral damage). Figure 4 shows that the residual temperature rose significantly more with prior art than it did with the Patent. Id. 11:1–11. But the Patent still caused a small increase in temperature. Id. Therefore, this significant temperature increase provides one example of "substantially no collateral damage": while prior art caused a rapid increase in temperature of at least one degree per second, the Patent allows the residual temperature to remain "substantially at room ambient." Id. 11:15–20.

Defendants argue that Figure 4 does not demonstrate "substantially no collateral damage" because the Patent's temperature increase cannot cause nerve damage. Def.s' Responsive Br. at 3 (quoting '894 Patent 11:2–4) ("[T]he temperature increase in the pulp vicinity must remain below 5 degrees C in order to at least avoid killing nerves."). But although Figure 4 may not display nerve damage, the specification's use of "at least" suggests that the temperature increase might cause other types of collateral damage. See 894 Patent 6:49–52 (heat can cause collateral damage).

Therefore, the phrase "substantially no" is sufficiently definite. When the specification does not use the phrase "substantially no," it replaces it with words like "minimal" or "negligible." See, e.g., Patent '894 5:58, 10:27; 11:31; 5:54–58. It also refers to "substantially eliminating" or "without causing extensive collateral damage." Id. 1:22–23; 6:39–43. The Track Two Defendants would construe the phrase as "no measurable." But that construction would read "substantially" out of the claim. See Info-Hold, Inc. v. Muzak LLC, 783 F.3d 1365, 1373 (Fed. Cir. 2015) (internal citations omitted) ("Claims must be interpreted with an eye toward giving effect to all terms in the claim."). It improperly suggests that the claim does not permit any collateral damage.

In sum, the final construction of "substantially no" is "minimal" because this properly conveys the meaning of the claims' and the specification's various descriptors.

B. "repeating said plasma formation step until a sufficient depth of material has been taken away from the target material"

Lawrence Livermore's Construction	Alcon's Construction	Track Two Defendants' Construction
No construction required. Plain and ordinary meaning. Alternatively: Performing the plasma formation step [until a sufficient depth of material has been removed]	No construction offered	directing multiple pulses at a location until a sufficient depth of material has been taken away from the target material

Claim 1 requires "repeating said plasma formation step at a pulse repetition rate greater than 10 pulses per second until a sufficient depth of material has been removed[.]" '894 Patent 16:48–50. The Track Two Defendants argue that this should be construed as "directing multiple pulses at a location until a sufficient depth of material has been taken away from the target material." Def.s' Opening Br. at 16.

Defendants' construction improperly limits an unambiguous claim: the claim does not specify multiple repeated pulses at a specific location and the specification does not suggest that the claim requires repetition at a specific location. Neither use the word location. Nor does the word "repeating" suggest that "multiple pulses" are necessary; a single pulse may be sufficient because the step is only repeated "until a sufficient depth of material has been removed." Furthermore the specification mentions numerous applications, some of which might only require single pulses. '894 Patent 16:1–6; 4:35–43 (applications

include situations where "diseased or undesired tissue is interspersed with healthy tissue, or in cases where the working area is exceptionally close or exceptionally delicate"); see Helmsderfer v. Bobrick Washroom Equip., Inc., 527 F.3d 1379, 1383 (Fed. Cir. 2008) ("[C]ase law generally counsels against interpreting a claim term in a way that excludes the preferred embodiment from the scope of the invention."). Finally, the specification implies that the laser may move around the target. Id. 15:44–47 (procedures require "a very deft touch because . . . features . . . are in very close proximity[.]"); 15: 65–67 (clinician may "dither" or "rasterize" the beam to "sculpt"). Therefore, numerous applications may involve only a single pulse that is then repeated across several locations.

Defendants' cited examples from the specification do not preclude a single pulse because each example could apply to either multiple pulses at one location or a single pulse followed by another single pulse at a subsequent location. Def.s' Opening Br. at 17. For example, the specification states that the Patent "allow[s] operation . . . at a high pulse repetition rate[.]" '894. It never states that a high repetition rate is necessary. Likewise, although it specifies that "varying the number of pulses provides a means of controlling the volume of material," such variation is not necessary. Thus, to require multiple pulses would improperly limit the claim.

Finally, the Track Two Defendants fail to offer any rationale for why "taken away from the target material" should replace "removed." They briefly assert that "removal" is too broad. But the claim uses "removed" not "taken away." Furthermore, the specification examples cited by Defendants repeatedly use "remove." See, e.g. '894 Patent Abstract ("Depth of material removed . . . ."); 3:54–57 (Patent's "material removal rates" exceed those of prior art); 3:66–4:7 (similar language); 10: 28–33 (same); 16:19–24 (same). Therefore, it would be improper for the Court to substitute "taken away" absent ambiguity.

In sum, the Court finds that no construction is necessary for the term "repeating said plasma formation step until a sufficient depth of material has been removed."

C. "each pulse having a pulse duration in the range from about 1 femtosecond to about 100 picoseconds"

Lawrence Livermore's Construction	Alcon's Construction	Track Two Defendants' Construction
No construction required Plain and ordinary meaning Alternatively: each pulse having a pulse duration in the range from approximately 1 femtosecond to approximately 100 picoseconds.	each pulse having a pulse duration in a range that begins at approximately 1 femtosecond, ends at approximately 100 picoseconds, and includes at least 1 femtosecond and 100 picoseconds	

Claim 1 requires that each pulse's duration be "in the range of from about 1 femtosecond to about 100 picoseconds." '894 Patent 16: 40–41. Defendants argue that the Court should construe this so that the range "includes at least 1 femtosecond and 100 picoseconds." Def.s' Opening Br. at 22. Defendants argue that this is consistent with the meaning of "about" which expands, but does not shrink, a range.

Defendants' proposed construction improperly limits the claim and conflicts with common usage. First, Defendants' construction adds a requirement that each pulse include exactly 1 femtosecond and 100 picoseconds. This requirement is not in the claim and it conflicts with common usage. Second, Defendants' construction conflicts with the common usage of "about" and "range." An approximate range need not include the specific values at either end: instead, a range of about 1-100 may include values on either side of 1 and on either side of 100. Likewise, a range of 1-100 includes the number 5. For instance, if someone says that he or she will be at the gym for about 1-100 minutes, then staying at the gym for 5 minutes would fall into that range.

Furthermore, the definitions of "about" contradict Defendants' proposed construction. See about: n.1, Merriam-Webster (Nov. 29, 2015) http://www.merriam-webster.com/dictionary/about (definitions of "about" include "reasonably close; almost; on all sides; and, in the vicinity"). For instance, the definitions "reasonably close" or "almost" suggest that something may fall short of a range — for instance 99 picoseconds may be reasonably close to 100 picoseconds.

Defendants' cited cases also contradict their proposed construction because all of their cases support including a wider range of values — not excluding values listed in the claim. See Def.s' Opening Br. at 23. First, Ortho-McNeil Pharm., Inc. v. Caraco Pharm. Labs., Ltd., held that "[t]he use of the word 'about,' avoids a strict numerical boundary to the specified parameter." 476 F.3d 1321, 1326 (Fed. Cir. 2007). This holding implicitly rejects Defendants' contention that an approximate range must include the specifically stated values. Second, Cent. Admixture Pharmacy Servs., Inc. v. Advanced Cardiac Sols., P.C., held that a range of "about 400-500" included the value 385; it did not hold that the range rejected 401-499. 482 F.3d 1347, 1356 (Fed. Cir. 2007). Finally, Cohesive Techs., Inc. v. Waters Corp., interpreted about 30 to include, 25.434 and larger, but exclude 23.044 and smaller. 543 F.3d 1351, 1370 (Fed. Cir. 2008). For values between 23.044 and 25.434 it created a function definition. In doing so, the court stated that the "the deliberate imprecision inherent in the word 'about' makes it impossible to 'capture the essence' of the claimed invention in strict numeric terms." Id. Therefore, Cohesive does not support Defendants' attempt to draft a specific numerical boundary.

In sum, the Court finds that no construction is required.

D. "directing said pulsed output beam onto a target material from which removal is desired"

Lawrence Livermore's Construction	Alcon's Construction	Track Two Defendants' Construction
No construction required	directing the pulsed output beam on the surface of a target material from which removal is desired	

Claim 11 requires "selective material removal by directing the pulsed output beam *onto* a target material from which removal is desired." '894 Patent 17:28–30 (emphasis added). Defendants argue that "onto" should be construed to mean "on the surface of." Def.s' Opening Br. at 12. Lawrence Livermore argues that term does not require construction.

Here, the specification repeatedly suggests that material removal occurs at the target's surface. For instance, ablation occurs "from the target surface." '894 Patent 16:15–16. Likewise, plasma formation occurs on the surface. Id. 7:59. Finally, the specification states that the process is repeated until a "sufficient depth of tissue has been removed." Id. 4:2–5. This suggests that plasma formation begins at the surface and moves incrementally deeper.

Relying on Figure 7, Lawrence Livermore argues that the specification uses "onto" interchangeably with "towards" or "to." Pl.s' Opening Br. at 18. But Figure 7 shows an "optical delivery system" for "directing the beam to a specific area of a material target"; it does not concern actual removal. 14:26–33.

Furthermore, extrinsic evidence supports Defendants' proposed construction. First, Merriam-Webster defines "onto" as "to a position on." See Onto, Merriam-Webster (Nov. 29, 2016), http://www.merriam-webster.com/dictionary/ont; see also Phillips, 415 F.3d at 1322 (dictionaries are often useful in claim construction). Substituting this language, the claim would read "directing said beam . . . to a position on the target material." See Conopco Inc. v. Warner-Lambert Co., No. CIV.A. 99-101 (KSH), 2000 WL 33310847, at *6–8 (D.N.J. Dec. 12, 2000) (using Merriam-Webster, among other sources, to construe "onto" to mean "onto the surface of"). Second, Dr. Neev himself distinguished the '894 Patent from the '199 Patent: "Clearly the

Neev, et al. '894 Patent does not teach nor contemplate volumetric power density at a desired location below the material surface." Prendergast Decl. Ex. F at 4.[2] Third, both Dr. Marjoribanks and Dr. Grundfest (Dr. Neev's expert) agree that the '894 Patent only applies to the removal of surface material. Marjoribanks Decl. ¶ 53; Prendergast Decl. Ex. E, Grundfest Depo. 210:10–14. Dr. Marjoribanks further argues that such removal must occur at the surface because otherwise ablation could not properly proceed. Marjoribanks Decl. ¶ 61. While Lawrence Livermore objects that contemporaneous sources of art undermine his opinion, this cannot overcome the weight of the evidence. See Pl.s' Responsive Br. at 13.

In sum, the Court construes "onto" to mean "onto the surface of."

[2] Lawrence Livermore argues that Goldenberg v. Cytogen, Inc., 373 F.3d 1158, 1167 (Fed. Cir. 2004), and Pfizer, Inc. v. Ranbaxy Labs. Ltd., 457 F.3d 1284, 1290 (Fed. Cir. 2006) preclude consideration of this evidence. But these cases only prevent consideration of unrelated patent prosecution history as intrinsic evidence; the Court may still consider it as extrinsic evidence of limited persuasiveness. See, e.g, Ne. Univ. v. Google, Inc., No. 2:07-CV-486-CE, 2010 WL 4511010, at *5 (E.D. Tex. Nov. 9, 2010) (treating "an unrelated patent filed by the same inventor" as extrinsic evidence); Elan Microelectronics Corp. v. Pixcir Microelectronics Co., No. 2:10-CV-00014-GMN, 2013 WL 2394358, at *19 (D. Nev. May 30, 2013) ("[A]s extrinsic evidence, this unrelated patent carries much less persuasive weight than the specification.").

E. "means for directing the pulsed output beam onto a target material from which removal is desired"

Lawrence Livermore's Construction	Alcon's Construction	Track Two Defendants' Construction
Function: directing the pulsed output beam onto/towards the target of the procedure Structure: an optical delivery system and equivalents thereof	No construction offered	Function: directing the pulsed output beam on the surface of the target material from which removal is desired Structure: hand-piece 30/105 and an optical delivery system

Claim 11 recites "A laser system adapted for selective material removal processing. the system comprising: . . . means for directing the pulsed output beam onto a target material from which removal is desired." '894 Patent 17:20–30. The parties agree that the term "means for directing" is subject to means-plus-function construction under 35 U.S.C. § 112(f).

Under 35 U.S.C. § 112(f), a means-plus-function claim "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." "First, the court must determine the claimed function. Second, the court must identify the corresponding structure in the written description of the patent that performs the function." Noah Sys., Inc. v. Intuit Inc., 675 F.3d 1302, 1311 (Fed. Cir. 2012) (internal citations omitted). A corresponding structure is one that specification or prosecution history "clearly links or associates . . . to the function recited in the claim." Id. (internal quotations omitted).

Here, the parties agree that the function is "directing the pulsed laser beam" but dispute whether the corresponding structure includes a "handpiece 30/105" in addition to an "optical delivery system."

The specification suggests that the handpiece is necessary for "directing" the pulsed beam. First, the specification states that "the laser pulse is directed to a material target, through a handpiece[.]" '894 Patent 13:44–45. Second, the specification states that the handpiece "allow[s] a dentist or clinician to maneuver the beam" and "allow[s] the cable to be more easily manipulated." Id. 14:38–44. Therefore, a handpiece is a necessary part of the structure.

Lawrence Livermore argues that this improperly "excludes another disclosed embodiment." But although the specification does not discuss how a handpiece could interact with an "open beam delivery system including coated reflectors and lenses," it does not state that such an embodiment could not include a handpiece. Therefore, this construction does not exclude a disclosed embodiment.

In sum, the final construction is "hand-piece 30/105 and an optical delivery system."

F. "thin layer portion"

Lawrence Livermore's Construction	**Alcon's Construction**	**Track Two Defendants' Construction**
No construction required Plain and ordinary meaning Alternatively: a small volume/depth of material, such as a layer less than 2 microns thick	No construction offered	A layer having a thickness that is relatively small in extent compared to its other dimensions

Claim 1 states that "each pulse interacts with a thin layer portion of said material[.]" '894 Patent 16:42–44. The Track Two Defendants offer the following construction: "a layer having a thickness that is relatively small in extent compared to its other dimensions." Def.s' Opening Br. at 23. Lawrence Livermore argues that no construction is required and, alternatively, that the phrase means "a

small volume/depth of material, such as a layer less than 2 microns thick." Pl.s' Opening Br. at 21.

The term is ambiguous because "thin" has multiple meanings that depend on context. In some uses a thin object may mean "relatively small in respect to its other dimensions." But when paired with other words "thin" has a different meaning. Here, "layer" is such a word. A "layer" is a "single thickness of a material covering a surface." layer: n.2.a., American Heritage Dictionary of the English Language (Nov. 30, 2016), https://ahdictionary.com/word/search.html?q=layer; see also layer: n.2.a., Merriam-Webster (Nov. 30, 2016), http://www.merriam-webster.com/dictionary/layer. Therefore, a "thin layer" is one that has little thickness or depth — it is shallow. See shallow: adj. 1, The American Heritage Dictionary of the English Language, (Nov. 30, 2016), https://ahdictionary.com/word/search.html?q=shallow. Defendants' cited definition supports this construction because an object that is "[r]elatively small in extent from one surface to the opposite" has little thickness or depth. Def.s' Opening Br. at 24, n.8 (quoting Prendergast Decl. Ex. G) ("thin: 1.a.").

Here, the specification shows that the word "thin" refers to the depth of the removed layer. For instance, Claim 1 states that "each pulse interacts with a thin layer portion" and forms a plasma "such that said material portion [i.e. the thin layer portion] is removed." '894 Patent 16:43–47. Next, the operator repeats that step "until a sufficient depth of material [i.e. a sufficient depth of thin layers] have been removed." Id. 16:48–50. The specification reinforces this relationship. After each pulse, material "ablates from the target surface" and removes a "small depth" of material per pulse. Id. 16:16–20; see also 4:66–5:05 (similar language).

Contrary to Defendants' arguments, the use of both "depth" and "thin" here does not show that the terms are unrelated: the "thin layer" is the initial point of interaction between the pulse and the target material; the "depth" is the measurement of material removed. See Def.s' Responsive Br. at 14. Defendants' examples from the specification and prior art suggest that — in some cases — the laser spot size may be significantly larger than the depth of removed material. See Def.s' Opening Br. at 25. But neither the specifications, nor the claims, suggest that such examples limit the patent to those relative dimensions. A thin layer remains thin without regard to the dimensions of the surface area removed.

In sum, the final construction for "thin layer portion" is "shallow layer portion." "Shallow" is preferable to "small depth/volume" because it more clearly indicates that the focus is on the depth of the material removed in comparison to other layers.

II. '199 PATENT

The '199 Patent is a "method and apparatus . . .for fast precise material processing and modification which minimizes collateral damage" '199 Patent, Prendergast Decl. Ex. B, Abstract. It uses "optimized, pulsed electromagnetic energy parameters" to minimize "residual energy deposition."

On March 5 2009, Dr. Neev filed suit for infringement of the '199 Patent against Abbott Medical. Neev v. Abbott Med. Optics, Inc., No. 1:09-cv-00146-RBK-JS (D. Del.), Docket No. 1. On March 26, 2012, the United States Court for the District of Delaware issued a ruling on claim construction. Merrill Decl. Ex. 4, Neev v. Abbott Med. Optics, Inc., No. 1:09-cv-00146-RBK-JS, 2012 U.S. Dist. LEXIS 42024 (D. Del. Mar. 26, 2012) (hereinafter the "Delaware Markman Opinion"). The case settled soon after and court dismissed the case with prejudice. Neev v. Abbott Med. Optics, Inc., No. 1:09-cv-00146-RBK-JS (D. Del.), Docket No. 155.

A. Collateral estoppel applies to Abbott Medical.

The first issue is whether the Delaware decision has any preclusive effect on Abbott Medical.[3] Collateral estoppel may apply to claim construction. Int'l Gamco, Inc. v. Multimedia Games Inc., 732 F. Supp. 2d 1082, 1090 (S.D. Cal. 2010) (citing In re Freeman, 30 F.3d 1459, 1465–69 (Fed.Cir.1994)); see also RF Delaware, Inc. v. Pac. Keystone Techs., Inc., 326 F.3d 1255, 1261 (Fed. Cir. 2003). The Court finds that it applies here.

None of the parties correctly state the standard for collateral estoppel in a patent case within the Ninth Circuit. Dr. Neev relies on A.B. Dick Co. v. Burroughs Corp., 713 F.2d 700, 702 (Fed. Cir. 1983). But to determine whether

[3] The parties agree that the Delaware decision cannot have preclusive effect on the other Defendants because they were not parties to the Delaware case. Pl.s' Opening Br. at 31; Def.s' Responsive Br. at 16.

collateral estoppel applies, courts apply regional – not federal – circuit law. Soverain Software LLC v. Victoria's Secret Direct Brand Mgmt., LLC, 778 F.3d 1311, 1314 (Fed. Cir. 2015). Although Defendants recognize that Ninth Circuit law applies, they mistakenly rely on Oyeniran v. Holder — an immigration case. 672 F.3d 800, 806 (9th Cir. 2012). But for claim construction, district courts in this circuit have consistently applied the different standard articulated in Hydranautics v. FilmTec Corp., 204 F.3d 880, 885 (9th Cir. 2000). See, e.g. e.Digital Corp. v. Futurewei Techs., Inc., 772 F.3d 723, 726 (Fed. Cir. 2014) (affirming a California district court decision that applied Hydranautics' standard); Int'l Gamco, 732 F. Supp. 2d at 1090; Seirus Innovative Accessories, Inc. v. Gordini U.S.A. Inc., 849 F. Supp. 2d 963, 975 (S.D. Cal. 2012); U.S. Rubber Recycling, Inc. v. ECORE Int'l, No. CV0909516SJOOPX, 2011 WL 13043495, at *7 (C.D. Cal. Aug. 8, 2011), aff'd sub nom. U.S. Rubber Recycling, Inc. v. ECORE Int'l, Inc., 503 F. App'x 951 (Fed. Cir. 2013).

Therefore, in a Ninth Circuit patent case, collateral estoppel applies if "(1) the issue necessarily decided at the previous proceeding is identical to the one which is sought to be relitigated; (2) the first proceeding ended with a final judgment on the merits; and (3) the party against whom collateral estoppel is asserted was a party or in privity with a party in the first proceeding." Int'l Gamco, 732 F. Supp. 2d at 1090 (quoting Hydranautics, 204 F.3d at 885).

Here, the Court finds that collateral estoppel applies. First, the Delaware court previously construed three of the five terms at issue here. Delaware Markman Opinion at 11–17. Those terms are: (1) "preparing the target region of the target material by spatially or temporally varying"; (2) "Operating the source and manipulating the beam parameters," "manipulating the beam parameters" "manipulating the parameters of the beam," "adjusting the characteristics of the electromagnetic radiation beam," and "varying at least one of the following beam parameters"; and (3) "allowing interaction energy transients caused by the electromagnetic pulses to substantially decay so that material modification is effected[.]" Delaware Markman Opinion at 11, 13, 16. In each case, the Delaware court adopted Dr. Neev's proposed construction. Id. at 12, 15, 17. Dr. Neev proposes the same constructions here as the Delaware court adopted. Compare id. at 8–9 with Pl.s' Opening Br. at 27, 32, 35. Therefore, the issues decided at the Delaware proceeding are identical. See Int'l Gamco, 732 F. Supp. 2d at 1089–90 (issues identical when same terms construed).

Second, the Delaware case ended in a final judgment on the merits because, in the Ninth Circuit, a court-approved settlement is a final judgment on the merits. E.Digital, 772 F.3d at 725 (affirming California district court's application of collateral estoppel to claim construction, even though the case was settled post-construction); see also Int'l Gamco, 732 F. Supp. 2d at 1091 (citing Reyn's Pasta Bella, LLC v. Visa USA, Inc., 442 F.3d 741, 746 (9th Cir. 2006)). Although Defendants argue that the dismissal order did not mention the Delaware Markman Order, no district courts evaluating collateral estoppel in the patent context have imposed such a requirement. See, e.g., id.; Curtiss-Wright Flow Control Corp. v. Z & J Techs. GmbH, 563 F. Supp. 2d 1109, 1122 (C.D. Cal. 2007) (applying collateral estoppel even though "the district judge had not adopted the magistrate judge's Markman recommendation before the case was settled."). Furthermore, "[a] party who cuts off his right to review by settling a disputed matter cannot complain that the question was never reviewed on appeal." Therefore, because "[t]he Markman rulings were not vacated as part of the settlement" they preclude relitigation. Curtiss-Wright, 563 F. Supp. 2d at 1122 (quoting TM Patents, LP. v. IBM Corp., 72 F. Supp. 2d 370, 378 (S.D.N.Y.1999)).

Third, Abbott Medical was a party in the previous action. See generally Neev v. Abbott Med. Optics, Inc., No. 1:09-cv-00146-RBK-JS (D. Del.).

In sum, collateral estoppel applies and Abbott Medical is bound by the Delaware court's previous order on claim construction. The Court will now construe the disputed terms as necessary.

B. "preparing the target region of the target material by spatially or temporally varying"

Dr. Neev's Construction	Alcon's Construction	Track Two Defendants' Construction
Altering the absorption or scattering characteristic of the target region of the target material in time or space, prior to irradiating the region with the electromagnetic pulses	Applying a preparation (i.e., an agent) to the target region of the target material in order to spatially or temporally vary	

Claim 1 states, in part, "preparing the target region of the target material by spatially or temporally varying at least one of an absorption characteristic of the material or a scattering characteristic of the material at the target region[.]" Dr. Neev argues that the claim should be construed to mean "altering the absorption or scattering characteristic of the target region of the target material in time or space, prior to irradiating the region with the electromagnetic pulses." Defendants' argue that is should mean "applying a preparation (i.e., an agent) to the target region of the target material in order to spatially or temporally vary." The primary difference between these constructions is whether the target material can be modified *only* by an agent.

Dr. Neev points to statements in the specification that "scattering and/or absorption centers, defects, or highly absorbing components are added to the target material with spatial and/or temporal selectivity to specific, predetermined locations within the target material." '199 Patent 10:21–26; see also 9:31–35; 41:40–60. Dr. Neev argues that he acted as his own lexicographer when he stated, "[t]he third method for advantageously defining the interaction parameters comprises adding absorption centers, localized defects in the material, and/or highly absorbing or highly scattering components (collectively defined by the inventor as 'doping agents')." Pl.s' Opening Br. at 28 (quoting '199 Patent 19:42–46). Therefore, any of these methods are acceptable and applying an agent is merely an optional embodiment that does not limit Claim 1. Id. at 30.

Defendants argue that every portion of the specification that discusses "preparing" the target region also discusses using an agent. Def.s' Responsive Br. at 17; see e.g., '199 Patent 19:41–53; 20:7–12; 40:46–55; 42:24–33. Defendants also argue that the Patent's prosecution history supports their construction. Def.s' Opening Br. at 29. During reexamination, Dr. Neev argued that his method was distinct from prior art's compression method because his method involved "spatially or temporally varying at least one of an absorption characteristics of the cornea[.]" Prendergast Decl., Ex. J at 30.

The specification suggests that the "preparation" envisioned in Claim 1 involves some form of agent. Each discussion of "preparation" mentions an "absorption agent." The specification states that materially is "temporally and spatially prepared and/or injected with absorbing agents." '199 Patent 42:47–58. These "selective depositions of absorbing agents . . . can assure time- and space-dependent, selective interactions." Id.

But the specification cannot improperly limit the claim's language. As the Delaware court also found, Claims 56 and 57 specifically describe mechanical means to modify the target material. Delaware Markman Opinion at 15. Claim 56 reads "the method of claim 1 . . . comprises creating compression zones with the target region." Likewise, Claim 58 states that it "comprises . . . changing a density of the target material at the target region." Therefore, because the Court must focus on the claims' particular language, the specification cannot limit the claims here.

In sum, the Court adopts Dr. Neev's proposed construction. The final construction is: "altering the absorption or scattering characteristic of the target region of the target material in time or space, prior to irradiating the region with the electromagnetic pulses."

C. "Operating the source and manipulating the beam parameters" "manipulating the beam parameters" "manipulating the parameters of the beam" "adjusting the characteristics of the electromagnetic radiation beam" "varying at least one of the following beam parameters"

Dr. Neev's Construction	Alcon's Construction	Track Two Defendants' Construction
[operating the source and] setting or adjusting one or more beam parameters prior to or during the operation of the source	manipulating the beam parameters of the laser source during the operation of the laser source	

Multiple claims require the adjustment or manipulation of beam parameters. Dr. Neev wants to construe these terms to mean "setting or adjusting one or more beam parameters prior to or during the operation of the source." Pl.s' Opening Br. at 35. Defendants want to construe these to mean "manipulating the beam parameters of the laser source during the operation of the laser source." In essence, the parties differ on whether the operator may adjust the beam parameters before operation, or must adjust them during the operation.

The specification suggests that the operator may adjust beam parameters before the source. It states that "at least one characteristic of the material to be ablated is first determined and then a pulse of the directed energy is defined." '199 Patent 6:7–9. It also lists ways to determine the material's characteristics pre-ablation. Finally, it states that ablation may occur with a "single pulse." Id. 9:19–20. All of these phrases suggest that beam parameters may require adjustment before the operation.

In sum, the Court adopts Dr. Neev's proposed construction. The final construction is "setting or adjusting one or more beam parameters prior to or during the operation of the source."

D. "Approximately"/ "about"

Dr. Neev's Construction	Alcon's Construction	Track Two Defendants' Construction
No Construction required Alternatively To be "within an order of magnitude," or to estimate a quantity "to order of magnitude," means that your estimate is roughly within a factor of ten.	a range that begins at approximately 1 femtosecond, ends at approximately 100 milliseconds, and includes at least 1 femtosecond and 100 milliseconds	

For the same reasons as stated above with respect to the '894 Patent, the Court finds that the terms "about" and "approximately" are unambiguous and do not require construction. Specifically, there is no basis to require at least one pulse at the beginning and end points of the range. See Section I.C., infra.

E. "allowing interaction energy transients caused by the electromagnetic pulses to substantially decay so that material modification is effected"

Dr. Neev's Construction	Alcon's Construction	Track Two Defendants' Construction
Allow[ing] energy transients in the target material that are created by interaction of electromagnetic radiation with the target material and caused by the electromagnetic pulses incident on the target material to substantially [sufficiently] decay such that the material is modified allow energy transients in the target material that are created by interaction of electromagnetic radiation with the target material and caused by the electromagnetic pulses incident on the target material to decay sufficiently such that the material can be modified	No construction proposed	Providing a temporal separation between pulses to allow interaction energy transients to substantially decay so that material modification is effected

Here, the parties dispute whether there must be temporal separation between pulses. Defendants argue that temporal separation between pulses is necessary, while Dr. Neev argues that spatial separation is also sufficient.

The specification states that permitting the energy transients to substantially decay before a subsequent pulse minimizes collateral damage. '199 Patent 44:10–13. But the specification does not say that temporal separation is necessary for substantial decay. Therefore, Defendants' proposed construction improperly limits the claims. The Delaware court similarly agreed that Dr. Neev's proposed

construction "avoids importing limitations not present in the claims or the specifications of '199 Patent." Delaware Opinion at 17.

In sum, the Court adopts Dr. Neev's proposed construction.

F. "feedback device"

Dr. Neev's Construction	Alcon's Construction	Track Two Defendants' Construction
A feedback device is a device capable of providing information or imaging or an output of a sensor returned to the operator or the system control.	No construction offered	A device that monitors ablation and electronically controls the beam source in response

Here, the parties differ on whether the "feedback device" is intended to adjust the source (Defendants' construction), or whether it is any device capable of providing information to the operator or system control (Dr. Neev's construction).

Together, the claims and specification clarify that the feedback device is intended to provide feedback on the beam's operation. For instance, the "feedback analyzer" provides a "feedback signal." '199 patent 55:65–56:02. These "operate in conjunction with the laser to allow precise control of ablation end points." Id. 55:58–50. Likewise, Figure 17 "shows a typical collection and diagnostic setup with feedback means for monitoring ablation and controlling the Electromagnetic beam source." Id. 75:64–67.

In sum, the final construction is: "A device that monitors ablation to allow for electronic or operator control of the beam source in response." There is no basis to conclude that the feedback device performs the control function to the exclusion of the operator who receives and acts upon the feedback. This

construction slightly broadens Defendants' proposed construction to accord with the specific language.

III. '926 PATENT

The '926 Patent is "an energy source capable of generating short bursts of energy at a variable pulse repetition rates. The repetition rates range from a single shot to several hundred Mega-Hertz so that selective, three dimensional interactions with a volumetric zone of skin or issue can be created substantially without damage or substantial changes to overlying or underlying or surrounding tissue or skin." Prendergast Decl., Ex. C, '926 Patent, Abstract.

A. "multiple beam generating optic" and "plurality of beams"

Term	**Dr. Neev's Construction**	**Alcon's Construction**
Multiple beam generating optic	An optical assembly capable of generating multiple beams	Optic generating more than one beam at the same time
Plurality of beams	Multiple beams	Plurality of simultaneous beams

Claim 6 is for "[a] device for treating a region of a target having a surface comprising: an energy source coupled with at least one multiple beam generating optic; and a controller that operates the energy source to direct said plurality of beams below the surface of the target[.]" '926 Patent 49:47–53. The parties differ on whether the claim requires that device generate more than one beam simultaneously. Defendants argue that the claim requires a device to create multiple beams simultaneously. Def.s' Opening Br. at 38. Dr. Neev argues that the claim only requires a device that can create multiple, including both simultaneous and sequential beams. Pl.s' Opening Br. at 41.

The claim and specification's language show that the claim requires multiple, simultaneous beams. First, the claim's plain language suggests that

multiple beams are necessary. The phrase "multiple beam generating" implies a device capable of generating multiple simultaneous beams. If the device only needed to generate sequential beams then Dr. Neev would not have needed to highlight its multiple beam capability. Furthermore, the phrase "plurality of beams" suggests that multiple beams exist; if these were sequential beams then Dr. Neev could have used a different phrase, such as "repeating" or "sequential beams."

Second, the specification consistently refers to multiple, simultaneous beams. Figure 1 shows multiple simultaneous beams. '926 Patent, Figure 1. Dr. Neev argues that device in Figure 1 is capable of producing one beam or multiple beams. Pl.s' Responsive Br. at 30. But the specification describes this figure as "a schematic representation of a device that produces a plurality of energy beams[.]" '926 Patent 3:24–25. Next, under the heading "Optics and Generation of Multiple Beams," the specification states that "[a]ll suitable optics are contemplated, including especially a diffractive element that produces at least 3 beams." Id. 5:36–38.

Dr. Neev spends substantial time demonstrating that multiple beams can be generated from a single deflected beam. Pl.s' Responsive Br. at 30. But that does not address the distinction between simultaneous and sequential beams. Moreover, diffraction of a single beam to create multiple beams would appear to be an example of simultaneous beams.

In sum, because all the descriptions suggest multiple, simultaneous beams, the Court adopts Alcon's constructions as the final constructions: "optic generating more than one beam at the same time" and "plurality of simultaneous beams."

CONCLUSION

Term	Disputed Claim Term	Court's Construction
1	Substantially no collateral damage	Minimal damage to the area surrounding the target area, including, but not limited to, undesirable cracks, material charring, discoloration, surface melting and perceived pain
2	Repeating said plasma formation step	No construction required
3	About	No construction required
4	Onto	Onto the surface of
5	Means for directing	Hand-piece 30/105 and an optical delivery system
6	Thin layer portion	Shallow layer portion
7	Preparing the target region of the target material by spatially or temporally varying	Altering the absorption or scattering characteristic of the target region of the target material in time or space, prior to irradiating the region with the electromagnetic pulses
8	Operating the source and manipulating the beam parameters; manipulating the beam parameters; manipulating the parameters of the beam; adjusting the characteristics of the electromagnetic radiation beam; varying at least one of	Setting or adjusting one or more beam parameters prior to or during the operation of the source

9	About/approximately	No construction required
10	Allowing interaction energy transients caused by the electromagnetic pulses to substantially decay so that material modification is effected	allow[ing] energy transients in the target material that are created by interaction of electromagnetic radiation with the target material and caused by the electromagnetic pulses incident on the target material to substantially [sufficiently] decay such that the material is modified
11	Feedback device	A device that monitors ablation and electronically controls the beam source in response
12	Multiple beam generating optic	Optic generating more than one beam at the same time
13	Plurality of beams	Plurality of simultaneous beams