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**UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
SOUTHERN DIVISION**

NEWPORT CORPORATION,
Plaintiff,

vs.

**LIGHTHOUSE PHOTONICS
INCORPORATED,**
Defendant.

Case No.: SACV 12-0719 (JPRx)

**ORDER REGARDING CLAIM
CONSTRUCTION**

21
22 Before the Court are Plaintiff’s Claim Construction Brief (Dkt. 435) and Defendant’s
23 Claim Construction Brief (Dkt. 444). Having considered the briefs, the oppositions, the replies,
24 and the exhibits attached thereto, the Court construes three disputed claim terms.

25 **I. BACKGROUND**

26 This is a patent infringement suit that involves three patents regarding a family of lasers:
27 U.S. Patent No. 5,446,749 (“749 Patent”), No. 6,241,720 (“720 Patent”), and No. 6,287,298
28 (“298 Patent”) (together, “the patents-in-suit”). *See generally* First Am. Compl. (“FAC”).

1 On August 29, 1995, the U.S. Patent and Trademark Office (“USPTO”) issued the '749
2 Patent, entitled “Diode Pumped, Multi Axial Mode, Intracavity Doubled Laser.” FAC ¶ 8. On
3 June 5, 2001, the USPTO issued the '720 Patent. *Id.* ¶ 14. On September 11, 2001, the USPTO
4 issued the '298 Patent. *Id.* ¶ 20. The Newport Corporation (“Newport”) is the owner by
5 assignment of all right and title to and interest in the patents-in-suit. *Id.* ¶¶ 9, 15, 21.

6 Lighthouse Photonics Corporation (“Lighthouse”) makes, uses, sells, offers to sell,
7 supplies, and/or causes to be supplied to end users the “Sprout” line of lasers. *Id.* ¶¶ 11, 17, 23.
8 Newport alleges that Lighthouse’s Sprout lasers infringe on the patents-in-suit. *Id.* ¶¶ 10, 16,
9 22.

10 II. LEGAL STANDARD

11 “It is a bedrock principle of patent law that the claims of a patent define the invention to
12 which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303,
13 1312 (Fed. Cir. 2005) (en banc). Claim construction “begins with the claim language itself.”
14 *Id.* Claim terms are generally given “their ordinary and customary meaning,” which is “the
15 meaning that the term would have to a person of ordinary skill in the art.” *Id.* at 1312-13
16 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

17 The ordinary meaning is determined in the context of the specification and the
18 prosecution history. *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005).
19 The specification is “usually dispositive” in the claim construction analysis and is “the single
20 best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics*, 90
21 F.3d at 1582). It is “entirely appropriate for a court, when conducting claim construction, to
22 rely heavily on the written description for guidance as to the meaning of the claims.” *Id.* at
23 1317. If, within the prosecution history, a patentee clearly and unmistakably disavowed a claim
24 construction, then it disclaimed that construction. *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d
25 1314, 1324 (Fed. Cir. 2003); *SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1287
26 (Fed. Cir. 2005).

27 There is also “a presumption that each claim in a patent has a different scope.” *Comark*,
28 156 F.3d at 1187; *see also Phillips*, 415 F.3d at 1315. “[T]he presence of a dependent claim

1 that adds a particular limitation gives rise to a presumption that the limitation in question is not
2 present in the independent claim.” *Leibel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910
3 (Fed. Cir. 2004).

4 **III. ANALYSIS**

5 Newport and Lighthouse have agreed to the construction of most of the claim terms.
6 However, they dispute three, which the Court will address in turn.

7 **A. “Plurality of Axial Modes”**

8 The first term at issue is contained in both the '749 and '720 patents: “plurality of axial
9 modes.” Newport proposes that the claim term should be construed as “[t]hree or more axial
10 modes (longitudinal modes which satisfy the standing wave boundary condition of the laser
11 cavity).” Lighthouse proposes that the claim term should be construed as “10 axial modes and
12 as many as on the order of 100 axial modes, with no defined phase relation.”

13 The Court “begins with the claim language itself,” giving it “the meaning that the term
14 would have to a person of ordinary skill in the art.” *Phillips*, 415 F.3d at 1312-13. The entire
15 first claim in the '749 Patent reads as follows:

16
17 A diode pumped, multi axial mode, intracavity doubled laser, comprising:
18 a laser crystal positioned in the resonator cavity;
19 a doubling crystal positioned in the resonator cavity;
20 a diode pump source supplying a pump beam to the laser crystal and producing a
21 laser crystal beam with a *plurality of axial modes* that is incident on the doubling
22 crystal to produce a frequency doubled output beam, the resonator cavity
23 providing a sufficient number of axial modes to oscillate so that the doubled
24 output beam has a RMS noise of less than 3%; and
25 a power supply supplying power to the diode pump source.

26 Decl. of Jared A Brandyberry, Ex. 1 (“’749 Patent”) (emphasis added).

27
28 The first claim in the '720 Patent is very similar, reading as follows:

29
30 A diode pumped, multi axial mode, intracavity nonlinearly-converted laser
31 comprising:
32 at least two resonator mirrors defining a resonator cavity;
33 a laser crystal positioned in the resonator cavity;
34 a nonlinear conversion apparatus positioned in the resonator cavity; and

1 a diode pump source optically coupled to and supplying a pump beam to the laser
2 crystal and producing a laser crystal beam with a *plurality of axial modes* that are
3 incident on the nonlinear conversion apparatus to produce a nonlinearly converted
4 output beam, the output beam having a % RMS noise of less than 3%, the diode
5 pump source configured to be coupled to a power supply.

6 Decl. of Jared A Brandyberry, Ex. 2 (“720 Patent”) (emphasis added)

7 The central question is: how many axial modes is a “plurality”? On its face, the term
8 “plurality” means “the state of being plural,” i.e. more than one. *See, e.g., York Prods., Inc. v.*
9 *Cent. Tractor*, 99 F.3d 1568, 1575 (Fed. Cir. 1996). In other words, a plain reading of the
10 claim is that “plurality of axial modes” means “more than one axial mode.” *See id.* However,
11 both parties agree that the patentees acted as their own lexicographers to define “plurality” as
12 something other than “more than one.”

13 Newport’s expert, Dr. Philip H. Bucksbaum, PhD (“Dr. Bucksbaum”), explains that the
14 specification contained in the '749 Patent describes how two axial modes are “insufficient to
15 practice the invention[.]” Decl. of Philip H. Bucksbaum, Ex. 1 (“Dr. Bucksbaum Report”)
16 (Dkt. 466) at 25-26 (citing '749 Patent at 1:47-55; 3:30). At various points in the '749 Patent
17 specification, a laser of this type that has only “2 to 4 axial modes” is characterized as unstable,
18 or generating too much RMS noise. *Id.* In other words, according to Newport, the term
19 “plurality” must mean “more than two.”

20 Newport argues that it stops there—the ordinary meaning of “plurality” was only
21 slightly modified, adjusting the meaning from “more than one” to “more than two.” In support
22 of this construction, Dr. Bucksbaum opines that the '720 Patent elaborates that three axial
23 modes are sufficient. *Id.* (citing '720 Patent 6:55-7:14). Specifically, the '720 Patent states that
24 “[f]or the purposes of the following description of the invention . . . a ‘multiaxial’ mode
25 intracavity frequency-doubled laser as a laser where *on the order of 3 or more axial modes* are
26 oscillating at the fundamental infrared wavelength in the laser resonator.” '720 Patent at 6:55-
27 7:14 (emphasis added).

28 However, the Court disagrees with Newport’s selective reading of the patents. Both the
'749 and the '720 patent contain the following sentence in the specifications: “where 2 to 4
modes were oscillating, the green output power was seen to fluctuate with up to 100%

1 modulation depth.” ’749 Patent at 3:26-38; ’720 Patent at 4:25-42. In other words, *both* patents
2 distinguish themselves from prior art by explaining that having only two to four axial modes
3 generates too much noise to be effective. “Where the general summary or description of the
4 invention . . . criticizes other products . . . that lack the same feature, this operates as a clear
5 disavowal of these other products.” *Astrazeneca AB v. Mut. Pharm. Co.*, 384 F.3d 1333, 1340
6 (Fed. Cir. 2004); *see also Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1382-83
7 (Fed. Cir. 2011). Therefore, to the extent that the patentee modified the ordinary meaning of
8 “plurality,” it must have defined plurality to mean “more than four”—not, as Newport urges,
9 “more than two”—axial modes. In other words, the Court rejects Newport’s proposed claim
10 construction that “plurality” means “three or more”—given the ’749 and ’720 Patents’
11 disavowal of lasers containing only two to four axial modes, “plurality” must mean “five or
12 more.”

13 Indeed, this construction squares with the language that the ’720 Patent covers lasers
14 with “*on the order of 3 or more axial modes.*” *See* ’720 at 6:55-7:14 (emphasis added). The
15 phrase “on the order of” denotes an approximation, and “on the order of 3” is consistent with
16 “five or more.”

17 But, Lighthouse urges the Court to go further and to construe “plurality” as “ten or
18 more.” The thrust of Lighthouse’s argument is that the specifications contained in the ’749 and
19 ’720 Patents both use variations of the phrase “on the order of 10 or more” as examples of the
20 number of axial modes required in the patented lasers. The ’749 Patent states: “The present
21 invention is a diode-pumped, multi axial mode, intra-cavity doubled laser with low amplitude
22 noise. This is created by oscillating a plurality of axial modes, such as 10, and in some
23 instances ~100.” ’749 Patent at 4:51-54. The ’720 Patent contains the same sentences, and
24 adds: “With the present invention a large number of axial modes oscillate, with as few as on the
25 order of 10 and as many as about a 200, preferably about 100.” ’720 Patent at 4:25-27.

26 None of the language limits the claim in the manner that Lighthouse argues. Each
27 reference to “10 or more” is prefaced with indispensable modifying language. In some
28 instances, the patents employ the phrase “such as,” indicating that “10 or more” is merely an

1 example of the number of necessary axial modes. *See* '749 Patent at 4:51-54 (“such as 10, and
2 in some instances ~100”). Generally, such examples are not read into the claims. *Comark*
3 *Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (““particular
4 embodiments and examples appearing in the specification will not generally be read into the
5 claims.”).

6 In other instances, the patents employ the phrase “on the order of,” indicating an
7 approximate number. *See* '720 Patent at 4:25-27 (“with as few as on the order of 10”). Such
8 terms, like “about” and “substantially,” are “descriptive term[s] commonly used in patent
9 claims to ‘avoid a strict numerical boundary to the specified parameter.’” *Ecolab, Inc. v.*
10 *Envirochem, Inc.*, 264 F.3d 1358, 1367 (Fed. Cir. 2001) (quoting *Pall Corp. v. Micron Seps.*,
11 66 F.3d 1211, 1217 (Fed. Cir. 1995)). Therefore, it is clear that the phrase “on the order of 10”
12 cannot be read to precisely limit the number of axial modes to ‘10’. *See id.* The question turns
13 to: what is the range of numbers that are “on the order of 10”? That question must be answered
14 in the context of the overall range of potential axial modes. If, for example, the maximum
15 number of axial modes was ‘15’, then indeed, it would be too much of a stretch to posit that ‘5’
16 is on the order of ‘10’—the approximation would cover nearly the entire range. Here, however,
17 a laser can have up to 200 axial modes. If there can be anywhere between 1 and 200 axial
18 modes, then the proposition that ‘5’ is on the order of ‘10’ is not so unreasonable that it
19 mandates an alteration of the ordinary language of the claim. Therefore, the Court finds no
20 reason to increase the minimum number of axial modes from ‘5’ to ‘10’.

21 Finally, Lighthouse argues that the clause “no defined phase relation” should be read
22 into the claim term because Newport disavowed mode-locked axial modes in its prosecution
23 history of the '720 Patent. However, even if the Court granted the premise that Newport
24 disavowed mode-locking, it does not follow that there is “no defined phased relation.” In other
25 words, Lighthouse is attempting to apply an expansive gloss to Newport’s alleged disavowal.
26 However, the Court finds that these statements were not clear and unmistakable disavowals of
27 any type of phase relation; at most, it disavowed only mode locking. *See Omega Eng’g*, 334
28

1 F.3d at 1324. Therefore, the clause “no defined phased relation”—which appears nowhere in
2 the claim or prosecution history—is not properly imported into the claim.

3 In sum, the Court construes the claim term “plurality of axial modes,” contained in the
4 '749 and '720 Patents, as meaning: “five or more axial modes (longitudinal modes which satisfy
5 the standing wave boundary conditions of the laser cavity).”

6 **B. “Sufficient Number of Axial Modes”**

7 The second disputed term is contained in the '749 Patent, and reads as follows:
8 “sufficient number of axial modes to oscillate so that the doubled output beam has a RMS noise
9 of less than 3%.” Newport proposes that this term should be construed as “[t]here is a number
10 of axial modes (longitudinal modes which satisfy the standing wave boundary conditions of the
11 laser cavity) and the resulting output beam has a RMS noise of less than 3%.” Lighthouse
12 proposes that this term should be read as “10 axial modes and as many as on the order of 100
13 axial modes, with no defined phase relation.”

14 Both parties forward arguments that are substantially the same as their arguments for the
15 term “plurality of axial modes.” As above, the Court finds that the disavowal of prior art—
16 lasers containing two to four axial modes—is enough to construe “sufficient number of axial
17 modes” to mean “five or more,” i.e. more than four. Indeed, Newport concedes that, at least to
18 some extent, this disavowal contained in the specification limits the claim. However, the Court
19 also finds that the references to “on the order of 10 or more” that are contained in the '749 and
20 '720 Patents are not claim-limiting language. Furthermore, the Court finds that it is improper to
21 consider the extrinsic evidence presented by Lighthouse—statements made by the original
22 inventors and language from user’s manuals—because it would contradict the language
23 contained in the patent claim and specification.

24 Therefore, the Court construes “sufficient number of axial modes to oscillate so that the
25 doubled output beam has a RMS noise of less than 3%” to mean “five or more axial modes
26 (longitudinal modes which satisfy the standing wave boundary conditions of the laser cavity),
27 which result in an output beam that has an RMS noise of less than 3%.”

C. Pump Beam Diameter in the Laser Crystal

The third disputed term is contained in the '298 Patent, and reads as follows: “pump beam diameter in the laser crystal.” Newport proposes that this term be construed as “the diameter of the pump beam in the laser crystal* *the diameter may be determined using full width half maximum (FWHM), $1/e^2$ or any other acceptable methodology known to those of ordinary skill.” Lighthouse proposes that this term be construed as “[o]ver the entire portion of the laser crystal extending from the laser crystal surface which accepts the pump beam to a distance of $1/e$ absorption depth of the pump beam into the crystal, the pump beam diameter is larger than the TEM_{00} mode diameter. The beam diameter is measured at the $1/e^2$ intensity level.”

Newport’s construction tracks the language of the claim. On the other hand, Lighthouse’s construction is considerably more elaborate. In support of this construction, Lighthouse presents expert testimony regarding the proper position from which to measure the width of the pump beam, and the intensity level at which the beam should be measured. However, such expert testimony requires a very substantial expansion of the language contained in either the claim or the specification. The Federal Circuit has counseled that “a court should discount 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.’” *Phillips*, 415 F.3d at 1318 (quoting *Key Pharms. v. Hercon Labs. Corp.*, 161 F.3d 709, 716 (Fed. Cir. 1998)).

Therefore, the Court adopts Newport’s proposed construction of the claim term; “pump beam diameter in the laser crystal” is construed as “the diameter of the pump beam in the laser crystal* *the diameter may be determined using full width half maximum (FWHM), $1/e^2$ or any other acceptable methodology known to those of ordinary skill.”

IV. DISPOSITION

For the reasons explained above, the Court construes the following terms in the follows ways:

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- The term “plurality of axial modes,” contained in the '749 and '720 Patents is construed as “five or more axial modes (longitudinal modes which satisfy the standing wave boundary conditions of the laser cavity).”
 - The term “sufficient number of axial modes to oscillate so that the doubled output beam has a RMS noise of less than 3%” contained in the '749 Patent is construed as “five or more axial modes (longitudinal modes which satisfy the standing wave boundary conditions of the laser cavity), which result in an output beam that has an RMS noise of less than 3%.”
 - The term “pump beam diameter in the laser crystal” contained in the '298 Patent is construed as “the diameter of the pump beam in the laser crystal* *the diameter may be determined using full width half maximum (FWHM), $1/e^2$ or any other acceptable methodology known to those of ordinary skill.”

9 DATED: May 7, 2014

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11 *David O. Carter*

12 _____
13 DAVID O. CARTER
14 UNITED STATES DISTRICT JUDGE

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