UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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SEOUL VIOSYS CO., LTD.,

Plaintiff,

-against-

P3 INTERNATIONAL CORP., et al.,

Defendants.

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16-CV-06276 (AJN)(SN)

OPINION & ORDER

SARAH NETBURN, United States Magistrate Judge:

Plaintiff Seoul Viosys Co., Ltd. ("Seoul Viosys") is a company headquartered and doing business in South Korea as a designer, manufacturer, and seller of ultra violet ("UV") light emitting diodes ("LEDs"), which are used as a UV light source in its MOSclean mosquito trap, among other applications and products. Defendant P3 International Corp. ("P3 International") is a United States-based importer, seller, and distributer of electronic devices containing LEDs, including the P7880 LED Bug Trap ("the P7880") and P7885 LED Bug Trapper II ("the P7885").

Seoul Viosys obtained the following patents for its UV LEDs: Numbers 7,982,207 ("the '207 Patent"); 7,951,626 ("the '626 Patent"); 9,203,006 ("the '006 Patent"); 8,692,282 ("the '282 Patent"); and 8,168,988 ("the '988 Patent"). On August 8, 2016, Seoul Viosys commenced this lawsuit, accusing P3 International of infringing five UV LED patents relating to its MOSclean UV LED mosquito trap device technology, specifically, that P3 International has sold, offered for sale, or imported products, such as the P7880 and the P7885, containing the patented UV LEDs.

The parties have submitted a joint claim construction chart and separate briefings with respect to six terms in four of the patents in suit. The disputed terms will be construed based on the paper record currently before the Court. There is no need to conduct a hearing with live testimony and oral argument. See, e.g., Rubie's Costume, Co. v. Disguise, Inc., No. 99 Civ. 3189 (AGS), 2000 WL 798627, at *1–2 (S.D.N.Y. June 20, 2000) (the form a Markman hearing takes lies in the sound discretion of the Court).

I. Principles of Claim Construction

A. Purpose of Claim Construction

Before reaching the merits, the Court must construe the terms used in the patent, pursuant to Markman v. Westview Instruments, Inc. 52 F.3d 967, 978–79 (Fed. Cir. 1995) ("Markman") (the construction of a patent is a question of law for a judge, not one of fact for a jury); see also Joao v. Sleepy Hollow Bank, 348 F. Supp. 2d 120, 122 (S.D.N.Y. 2004) ("Only after the court construes the claims in the patent can the parties proceed to adjudicate the merits issues of validity and infringement.").

The purpose of claim construction is to give the jury "a clear understanding of the disputed claim scope." Eon Corp. IP Holdings v. Silver Spring Networks, 815 F.3d 1314, 1320 (Fed. Cir. 2016). "This means that, as to claim coverage, the district court must instruct the jury on the meanings to be attributed to all disputed terms used in the claims in suit so that the jury will be able to intelligently determine the questions presented." Sulzer Textil A.G. v. Picanol N.V., 358 F.3d 1356, 1366 (Fed. Cir. 2004).

B. Sequence of Claim Construction

1. Primacy of Intrinsic Evidence

The meaning of a claim should primarily be interpreted in light of the intrinsic evidence, which constitutes the public record of the patent on which the public is entitled to rely. See Markman, 52 F.3d at 979. If the intrinsic evidence is sufficient to resolve the meaning of a disputed term, a court cannot use extrinsic evidence, including expert testimony. See Vitrionics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1583 (Fed. Cir. 1996). Extrinsic evidence should be considered only where an ambiguity in a disputed claim term must be resolved. See CVI/Beta Ventures, Inc. v. Tura, L.P., 112 F.3d 1146, 1153 (Fed. Cir. 1997).

A court looks first to the language of the claims as written. See Vitrionics Corp., 90 F.3d at 1582 (internal citation omitted). Proper construction turns on the "ordinary and accustomed meaning" of the claim term "as understood by one of ordinary skill in the art." Hockerson–Halberstadt v. Avia Grp. Internat'l, 222 F.3d 951, 955 (Fed. Cir. 2000) (collecting cases); Markman, 52 F.3d at 986 ("[T]he focus in construing disputed terms in claim language . . . is on the objective test of what one of ordinary skill in the art at the time of the invention would have understood the term to mean.").

Second, "it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning." Vitrionics Corp., 90 F.3d at 1582. Because the specification must contain a description sufficient to enable those of ordinary skill to make and use the invention, the specification "is the single best guide to the meaning of a disputed claim term." Vitrionics Corp., 90 F.3d at 1582.

Third, the court should consider the prosecution history of the patent, which constitutes "the complete record of the proceedings before the Patent and Trademark Office." Joao, 348 F.

Supp. 2d at 123; see also Vitrionics Corp., 90 F.3d at 1582 (citing Markman, 52 F.3d at 980; Graham v. John Deere, 383 U.S. 1, 33 (1996)). The prosecution history constitutes "the complete record of the proceedings before the Patent and Trademark Office." During the course of the patent application process, the applicant may have made express representations regarding the scope of the invention, so the prosecution history is "of critical significance to determining the meaning of the claims." Id. (citing Markman, 52 F.3d at 980; Southwall Tech., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1576 (Fed. Cir. 1995)). "The prosecution history may demonstrate that the claims do not cover some matters that would otherwise be encompassed in the plain meaning of the words used." Joao, 348 F. Supp. 2d at 123. Furthermore, "the prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution." Southwall Tech., Inc., 54 F.3d at 1576.

2. Limited Use of Extrinsic Evidence

Because claim construction is exclusively within the Court's province and imposes an "objective test" based on the public record rather than the subjective intent of the patent drafters, Markman, 52 F.3d at 986, "the use of extrinsic evidence in claim construction is quite limited." Revlon Consumer Prods. Corp. v. Estee Lauder Co., Inc., No. 00 Civ. 5960 (RMB)(AJP), 2003 WL 21751833, at *11 (S.D.N.Y. July 30, 2003). Extrinsic evidence is all evidence "external to the patent and file history, such as expert testimony, inventor testimony, dictionaries, and technical treatises and articles." Vitrionics Corp., 90 F.3d at 1584; accord, e.g., Markman, 52 F.3d at 980. If the patent documents (the plain language of the patent, the specification, and the prosecution history) are unambiguous, expert testimony regarding the meaning of a claim is entitled to no weight. See Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1212 (Fed. Cir. 2002) (internal citations and quotation marks omitted). But "in the rare circumstance that the

court is unable to determine the meaning of the asserted claims after assessing the intrinsic evidence," the court may examine "additional evidence that is extrinsic to the complete document record to help resolve any lack of clarity." Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc., 262 F.3d 1258, 1269 (Fed. Cir. 2001); see also Verve, LLC v. Crane Cams, Inc., 311 F.3d 1116, 1119–20.

One category of extrinsic evidence is expert opinions. In general, trial courts may "hear" expert testimony "for background and education on the technology implicated by the presented claim construction issues." Key Pharms. v. Hercon Labs. Corp., 161 F.3d 709, 716 (Fed. Cir. 1999). But "using" expert testimony to construe a claim in a way that is contrary to the written record of the patent is improper. Revlon Consumer Prods. Corp., 2003 WL 21751833, at *13; see also Bell & Howell Doc. Mgmt. Prods. Co. v. Altek Sys., 132 F.3d 701, 706 (Fed. Cir. 1997) ("[A]ny expert testimony that is inconsistent with unambiguous intrinsic evidence should be accorded no weight."); Vitrionics Corp., 90 F.3d at 1584 ("[E]xtrinsic evidence in general, and expert testimony in particular, may be used only to help the court come to the proper understanding of the claims; it may not be used to vary or contradict the claim language. . . . Nor may it contradict the import of other parts of the specification.").

II. Construction of the Disputed Claims

A. '867 Patent

1. "On"

The term "on" appears in Claim 1 as follows:

> A light-emitting device, comprising:
> a first conductivity-type semiconductor disposed *on* a substrate;
> an active layer disposed *on* the first conductivity-type semiconductor layer;
> a second conductivity-type semiconductor layer disposed *on* the active layer;
> an irregular convex-concave pattern disposed *on* a surface of the first conductivity-type semiconductor layer, and a first electrode pad[.]

U.S. Patent 9,269,987 ("'867 Patent") at Column 11, Lines 6-15 (ECF No. 98-1) (emphasis added). Plaintiff contends that "on," in the '867 Patent, means "upon or above." According to plaintiff, the term "on" does not require a direct physical connection between two separate structures. See Pl.'s Mem. at 12 (ECF No. 97). Defendant proposes the "plain and ordinary" meaning of "on," which it believes connotes "direct[]" contact. Df.'s Mem. at 8 (ECF No. 105).

The Court begins its analysis with the Claims themselves. See Phillips v. AWH Corp., 415 F.3d 1303, 1314 (Fed. Cir. 2015); see also Vitrionics Corp., 90 F.3d at 1582 (internal citation omitted). Claim 1 enumerates the various structural components of the LED: the substrate layer, a first conductivity-type semiconductor layer, an active layer, and a second conductivity-type semiconductor layer. "On," as used in Claim 1, describes a structural relationship or position between the four distinct layers. Claim 5, which incorporates Claim 1, provides additional components of the LED: "a first electrode pad disposed on the exposed surface of the first conductivity-type semiconductor layer, wherein an upper portion of the first conductivity-type semiconductor layer contacting the first electrode pad comprises a flat surface." '867 Patent at Column 11, Lines 50-55. Claim 8, which in turn incorporates Claim 5, refers to "a second electrode pad disposed *on* the second conductivity-type semiconductor layer; and a *transparent* conductive layer disposed *between* the second conductivity-type semiconductor layer and the second electrode pad." Id. at Column 12, Lines 8-13 (emphasis added). Claim 8 makes clear that, although there is a transparent conductive layer between the second electrode pad and the second conductivity-type semiconductor layer, the second electrode pad is still referred to being "on" the second conductivity-type semiconductor layer.

In addition, the specification for the '867 patent explicitly defines "on": "It will be understood that when an element or layer is referred to as being 'on' . . . another element or

layer, it can be *directly on or directly connected* to the other element or layer, *or intervening elements or layers may be present*." Id. at Column 3, Lines 28-31 (emphasis added). The specification distinguishes "on" from "directly on," which refers to when "there are *no intervening elements or layers present*." Id. at Column 3, Lines 32-34 (emphasis added). Defendant cites several instances in which "on" refers to an element or layer being placed directly on top of and in contact with another element or layer. See id. at Column 2, Lines 6-18, 21-33; Column 4, Lines 45-47, 53-57; Column 5, Lines 8-10, 61-63. But defendant's proposed construction overlooks the fact that "on," according to the specification, encompasses both direct contact *and* intervening layers.

The Court accordingly adopts the definition of "on" as outlined in the specification—"directly on or directly connected to the other element or layer, or intervening elements or layers may be present."

2. "Exposed from"

Claim 1 of the '867 Patent states in relevant part:

> A light-emitting device, comprising:
> a first conductivity-type semiconductor disposed on a substrate;
> an active layer disposed on the first conductivity-type semiconductor layer;
> a second conductivity-type semiconductor layer disposed on the active layer;
> an irregular convex-concave pattern disposed on a surface of the first conductivity-type semiconductor layer, and a first electrode pad,
> [. . .]
> wherein the first conductivity-type semiconductor layer comprising the irregular convex-concave pattern is *exposed from* the active layer and the second conductivity-type semiconductor layer[.]

'867 Patent at Column 11, Lines 6-23 (emphasis added). With regards to "exposed from," plaintiff suggests "uncovered by." Pl.'s Mem. of Law at 5. Defendant, on the other hand, offers the "straightforward" meaning of "exposed from" and refers to the process of "removing" what

was previously "disposed on." Df.'s Mem. of Law at 6–7; Joint Claim Construction Statement at 2 (ECF No. 83).

The Court agrees with defendant that "exposed from" logically follows "disposed on" in the sequence. After the active layers and the second conductivity-type semiconductor layers are placed over the first conductivity-type layer, "exposed from" describes how specific portions of the first conductivity-type semiconductor layer (i.e., the irregular convex-concave pattern) are then removed or separated from the active and second conductivity-type semiconductor layers.

In addition, the specification for the '867 Patent consistently uses "exposed" to refer to removing the two layers placed above or over the first conductivity-type semiconductor layer via methods like photolithography and etching. For example, forming the LED requires "*exposing* the first conductivity-type semiconductor layer by *partially removing* the active layer and the second conductivity-type semiconductor layer through photolithography and etching." Id. at Column 2, Lines 23-25 (emphasis added). An irregular convex-concave pattern is then created "on the exposed first conductive type semiconductor layer by forming a photosensitive pattern on the mask." Id. at Column 2, Lines 32-33. See also Column 4, Lines 28 to 32 ("The first electrode pad and the first electrode legs may be formed on a region of the first conductive type semiconductor layer, which is *exposed by partially etching* the second conductive type semiconductor layer and the active layer.") (emphasis added); Column 5, Lines 15-23 ("In the edge region of the [LED] where electrons and holes have low mobility, the first conductive type semiconductor layer is *exposed by etching* . . . the second conductive type semiconductor layer and the active layer for extraction of light.") (emphasis added); Column 7, Lines 60-62 to Column 8, Lines 1-8 ("[T]he first conductive type semiconductor layer is *partially exposed by a patterning process*, for example, photolithography and etching, using masks . . . Then, etching is

performed using the photosensitive layer pattern as a mark such that the second conductive type semiconductor layer and the active layer are *partially removed to expose* the first conductive type semiconductor layer.") (emphasis added).

Plaintiff contends that the term "exposed from" corresponds to a physical, structural aspect of the device and should therefore be construed as "uncovered by" to distinguish the structural description of the device from a "process step." Pl.'s Mem. of Law at 6–8. But this construction ignores the sequence set forth in both the plain language of Claim 1 and the specification, in which each layer is "disposed on" the layer before it and the first conductive-type semiconductor layer is *then* "exposed from" the two layers after it. Furthermore, "uncovered *by*" does not capture this process as squarely as "exposed *from*": "by" seems to refer to some action taken by the active and the second-conductive semiconductor layers, whereas "from" references more accurately the various methods of removal cited in the specification, such as etching and photolithography.

Accordingly, the Court adopts the following definition of "exposed from": "removed from, via etching, photolithography, or other methods."

B. "On" in '006 Patent

The term "on" appears in Claim 1 of the '006 Patent as follows:

> A light-emitting device, comprising:
> a first lead frame and a second lead frame spaced apart from each other, the first and second lead frames each comprising a first portion, and a second portion disposed *on* the first portion; a light-emitting diode chip disposed *on* the second portion of the first or second lead frame; and
> [. . .]
> wherein a first space is disposed between the first portion of the first lead frame and the first portion of the second lead frame, and the first fixing element is disposed *on* the first space.

U.S. Patent 9,203,006 ("'006 Patent") at Column 6, Lines 12-32, Ex. 2 to Eisenberg Decl. (ECF No. 98-2) (emphasis added). Plaintiff offers the construction of "upon or above," Pl.'s Mem. of

Law at 15, while defendant proposes that "on" should be construed according to "its ordinary, plain meaning." Df.'s Mem. of Law at 8.

According to plaintiff, defendant "intends to argue that the term 'on' requires direct contact." Joint Claim Construction Statement at 8. Plaintiff acknowledges that "there appears to be no meaningful dispute between the parties with respect to this claim term" but contends that "on" should mean "upon or above" for purposes of consistency across the patents. Pl.'s Mem. of Law at 14–15. But plaintiff has cited no legal authority for the proposition that a term should be given the same meaning across the patents. The law with respect to claim construction makes clear that intrinsic evidence (i.e., the claims, specification, and prosecution history of the patent at issue) is prioritized over extrinsic evidence, including other patents. See Cox Commc'n, Inc. v. Sprint Commc'n Co. LP, 838 F.3d 1224, 1228 (Fed. Cir. 2016) (extrinsic evidence includes other patents); Ampex Corp. v. Eastman Kodak Co., 460 F. Supp. 2d 541, 546 (D. Del. 2006) (same).

The term "on" in Claim 1 of the '006 Patent refers to the positional or structural relationships between the various components in the LED. In the specification, "on" is used several times to refer to one element being placed directly over or above another. For example, "a light emitting device according to an exemplary embodiment includes a plurality of lead frame units, a light emitting diode chip mounted *on* one of the lead frame units, and a molding unit that is formed *on* a top surface of the lead frame units to protect the light emitting diode chip." '006 Patent at Column 2, Lines 64-67, Column 3, Lines 1-2 (emphasis added); see also id. at Column 3, Lines 18-23 ("When the molding unit is formed *on* top surfaces of the first and second lead frames and molding resin for the molding unit is filled in the fixing spaces such that the molding resin applied *on* the top surfaces of the first and second lead frames and the molding resin filled in the fixing spaces can be monolithic." (emphasis added)).

Because there appears to be no meaningful dispute with respect to the term "on" in the '006 Patent, the Court therefore adopts the following definition—"directly on or directly connected to the other element or layer."

C. "On" in '282 Patent

The term "on" appears in Claim 1 of the '282 Patent as follows:

> A light-emitting device, comprising:
> a light emitting diode chip;
> a lead frame comprising a chip area *on* which the light emitting diode chip is arranged; and
> a package body supporting the lead frame[.]

U.S. Patent 8,692,282 ("'282 Patent") at Column 8, Lines 10-14 (ECF No. 98-3) (emphasis added). As with the previous constructions for "on," plaintiff offers the construction "upon or above," Pl.'s Mem. of Law at 16–17, while defendant proposes the plain and ordinary meaning of "on," Df.'s Mem. of Law at 8–9.

Defendant cites portions of the specification that indicate an absence of intervening elements between the lead frame's chip area and the light emitting diode chip. See id. at Column 3, Lines 38-41 ("An upper surface of the package body may include a cavity. Part of the lead frame and the light emitting diode chip *mounted on* one region of the lead frame are exposed through the cavity." (emphasis added)); id. at Column 3, Lines 49-50 ("The lead frame has a chip area *on which* the light emitting diode chip is *mounted*." (emphasis added)); id. at Column 4, Lines 6-8 ("[O]ne electrode of the light emitting diode chip *mounted on* the chip area is connected to a first wire W1, which is bonded to the chip area." (emphasis added)). But the specification's explicit definition of "on" is not as restrictive as defendant would propose. Like the '867 Patent's specification, the '282 Patent's specification provides that "on" includes an element or layer being "directly on or directly connected to the other element or layer" *and*

"intervening elements or layers." Id. at Column 3, Lines 22-26. The Court thus adopts the following definition of "on": "directly on or directly connected to the other element or layer, or intervening elements or layers may be present."

D. '693 Patent

1. "Composition ratio of Al equal to 1"

Claim 1 of the '693 patent states in relevant part:

> A light emitting diode, comprising:
> [. . .]
> an $Al_xGa_{1-x}N$ ($0 \leq x \leq 1$) buffer layer interposed between the substrate and the first conductive semiconductor layer and comprising a first region having a composition ratio x of Al decreasing from the substrate to the first conductive semiconductor layer and a second region of the $Al_xGa_{1-x}N$ buffer layer having the *composition ratio of Al equal to 1*[.]

U.S. Patent 8,664,693 ("'693 Patent") at Column 6, Lines 2-13 (ECF No. 98-4) (emphasis added). With regards to "composition ratio of Al equal to 1," plaintiff proposes "consisting essentially of aluminum," reading "equal to 1" to allow for some trace amount of impurities so long as they do not "materially affect the basic and novel properties of the invention." PPG Indus. v. Guardian Indus. Corp., 156 F.3d 1351, 1354 (Fed. Cir. 1998). According to plaintiff, the composition ratio specified in Claim 1 uses only a single digit "1," without any decimal point or zeros, to denote that the ratio need not be precisely 1. Pl.'s Mem. of Law at 18–19. Defendant offers the plain and ordinary meaning of "equal to 1." Df.'s Mem. of Law at 9–10.

Plaintiff's proposed construction of "essentially equal to 1" is unavailing. Adding "essentially" creates ambiguity as to how much deviation from "1" is allowed, even though the specification and the prosecution history indicate that the composition ratio of aluminum should be "equal to 1." The specification does not contain any qualifier with respect to the composition ratio. See, e.g., Column 2, Lines 23-25 ("A portion of the $Al_xGa_{1-x}N$ buffer layer having the

composition ratio of Al equal to 1 may have a thickness of about 1nm to about 50 nm."); Column 3, Lines 62-65 ("In the $Al_xGa_{1-x}N$ buffer layer, a portion of the $Al_xGa_{1-x}N$ buffer layer which is in contact with the sapphire substrate has the composition ratio x of Al equal to 1 . . ."); Column 4, Lines 11-3 ("For example, the portion of the $Al_xGa_{1-x}N$ buffer layer having the composition ratio x equal to 1, i.e., the AlN buffer layer, may have a thickness of about 1 nm to about 50 nm."). Moreover, plaintiff does not address whether "essentially" should also be added to another portion of the buffer layer that has a "composition ratio of Al equal to 0." See Column 6, Lines 27-29.

In addition, the prosecution history indicates that Claim 1 was amended to include language requiring a "composition ratio of Al equal to 1." Claim 1 originally included the following language: "an $Al_xGa_{1-x}N$ ($0 \leq x \leq 1$) buffer layer interposed between the substrate and the first conductive semiconductor layer and comprising a first region having a composition ratio x of Al decreasing from the substrate to the first conductive semiconductor layer." '693 File History at SVC-00001966 (ECF No. 98-11). The Examiner rejected Claim 1 on the basis of U.S. Patent Application Publication No. 2003/0057434 to Hata et al. (the "Hata reference"), which disclosed "a composition ratio x of Al decreasing from the substrate to the first conductive semiconductor layer." Id. at SVC-00001948–49. The '693 patent applicants then added the following language to the end of Claim 1: "and a second region of the AlGa-N buffer layer having the composition ratio of Al equal to 1, wherein the first region contacts the second region." Id. at SVC-00001966. This amendment addressed the Examiner's issue with Claim 1 because the Hata reference had not disclosed the inventive concept of a composition ratio equal to 1. See id. at SVC-00001969 ("In order for a rejection under 35 U.S.C. § 102(b) to be proper, a single reference must disclose every claimed feature. To be patentable, a claim need only recite *a*

single novel feature that is not disclosed in the cited reference. Thus, the failure of a cited reference to disclose one or more claimed features renders the 35 U.S.C. § 102(b) rejection improper." (emphasis added)). The '693 patent applicants recited the amended Claim 1 and concluded, "Hata fails to disclose at least these features." Id. The Examiner accepted the amendment and allowed the claim.

Plaintiff argues that this prosecution history reveals only the applicants' admission that the composition ratio of Al equal to 1 was not disclosed in Hata. See Pl.'s Claim Construction Brief at 2 (ECF No. 97). But the impact of the prosecution history is not quite so narrow: more than simply noting the Hata reference's failure to disclose a limitation, the patent applicants clearly construed the "equal to 1" composition ratio as the Claim's inventive feature, i.e., the aspect that would defeat the Examiner's rejection. Adopting plaintiff's construction of "essentially" would broaden the meaning of a significant phrase when there is nothing in the specification or the prosecution history that would give the Court a basis for doing so. Because the patent documents themselves are unambiguous as to the meaning of "equal to 1," the Court declines to assign any weight to plaintiff's proffered expert testimony. See Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1212 (Fed. Cir. 2002) (internal citations and quotation marks omitted). Accordingly, "composition ratio of Al equal to 1" is construed to have its customary and ordinary meaning.

2. "On"

Claim 1 of the '693 Patent provides in relevant part:

> A light emitting diode, comprising:
> a substrate;
> a first conductive semiconductor layer comprising an N-type $Al_zIn_yGA_{1-z-y}N$ ($0 \leq z,y,z+y \leq 1$) layer positioned *on* the substrate;
> an $Al_xGa_{1-x}N$ ($0 \leq x \leq 1$) buffer layer interposed between the substrate and the first conductive semiconductor layer[.]

‘693 Patent at Column 6, Lines 2-8 (emphasis added). Plaintiff urges “upon or above” in construing “on,” Pl.’s Mem. of Law at 23–24, while defendant proposes the “ordinary, plain meaning” of “on,” Df.’s Mem. of Law at 9.

The plain language of the ‘693 Patent refers explicitly to an intervening layer between the substrate and the first conductive semiconductor layer, such that there is no direct contact between the two layers. Furthermore, with respect to the “method of fabricating” an LED, the specification articulates the following sequence: (1) “preparing a substrate”; (2) “forming an $Al_xGa_{1-x}N$ ($0 \leq x \leq 1$) buffer layer *directly on* the substrate”; and (3) “forming a GaN-based semiconductor layer comprising an N-type $Al_zIn_yGA_{1-z-y}N$ ($0 \leq z,y,z+y \leq 1$) layer on the $Al_xGa_{1-x}N$ ($0 \leq x \leq 1$) *buffer layer*.” Id. at Column 6, Lines 42-49 (emphasis added); see also Column 2, Lines 32-38, 53-57 (“Further, according to present invention, an AlN layer is formed on the substrate, the $Al_xGa_{1-x}N$ ($0 \leq x \leq 1$) buffer layer having the gradually decreasing composition ratio x of Al is *grown on* the AlN layer, and the GaN-based semiconductor layer is then formed . . .” (emphasis added)); Column 3, Lines 45-50 (“Particularly, since the GaN buffer layer *grown on* the sapphire substrate has a higher defect density, the first conductive semiconductor layer *grown on* the GaN buffer layer has deteriorated crystallinity, surface properties and electrical properties.” (emphasis added)).

Accordingly, both the plain text of the ‘693 Patent and its specification describe an intervening buffer layer between the substrate and the first conductive semiconductor layer, such that the use of “on” contemplates one layer being positioned or placed above the other but with no direct contact (i.e., with an intervening layer “disposed between”). In other words, even with a buffer layer placed between the first conductive semiconductor layer and the substrate layer, Claim 1 still describes the first conductive semiconductor layer as “on” the substrate layer.

Accordingly, the Court adopts the following definition of "on": "directly on or directly connected to the other element or layer, or intervening elements or layers may be present."

CONCLUSION

This claim-construction ruling will govern all subsequent proceedings. The parties shall confer and inform the court by joint letter, to be submitted by no later than September 15, 2017, as to how they propose to proceed.

SO ORDERED.

SARAH NETBURN
United States Magistrate Judge

DATED: September 11, 2017
New York, New York