United States District Court,
E.D. Michigan, Southern Division.

ALTAIR ENGINEERING, INC,
Plaintiff.
v.
LEDDYNAMICS, INC,
Defendant.

Aug. 12, 2008.

Christopher G. Darrow, Thomas N. Young, Young & Basile, Troy, MI, for Plaintiff.

John S. Artz, Dickinson Wright, Bloomfield Hills, MI, R. Bradford Fawley, Zachary R. Gates, Downs, Rachlin, Brattleboro, VT, for Defendant.

ORDER RESOLVING CLAIM CONSTRUCTION DISPUTE

GEORGE CARAM STEEH**, District Judge.**

Plaintiff Altair Engineering, Inc. (Altair) has filed suit against defendant LEDdynamics, Inc. (LEDdynamics) for patent infringement arising out of the sale of fluorescent tube replacement lights. Now before the Court are the parties competing briefs regarding claim construction. Both sides have filed lengthy opening briefs, response briefs, and voluminous exhibits. The Court has carefully considered all of the papers filed. Oral argument was heard on July 31, 2008. For the reasons set forth below, the Court adopts the claim construction argued by LEDdynamics.

I. INTRODUCTION

Altair is the owner by assignment of United States Patent No. 7,049,761 ('761 patent). The '761 patent issued on May 23, 2006. (Doc. 23, Exhibit A). It covers light-emitting diodes (LEDs) based fluorescent tube replacement lights. According to Altair, the invention seeks to replace and improve upon traditional fluorescent light tubes which have as their shortcomings a short life expectancy, a tendency to fail if subjected to vibration, the consumption of high amounts of power to operate, and general unreliability. LEDdynamics, on the other hand, alleges that the invention was intended to mount fluorescent tubes in a conventional fluorescent fixture or socket, not necessarily to produce the same lighting effect. The LED based florescent light tubes are used in a variety of places, including schools, offices, courts, and buses. The invented light tube is designed to mount within a conventional fluorescent light tube socket. Altair claims that the invention seeks to improve upon all the defects of the conventional fluorescent light tube in that it has a long life expectancy, is resistant to vibration, consumes low amounts of power, and is highly reliable. LEDdynamics argues that none of the alleged shortcomings deal with or criticize the illumination level and effect of conventional fluorescent light systems. There were three inventors of the patented light tube. One of those inventors, John Ivey, has submitted an affidavit in support of Altair's position on claim

construction.

The parties agree that the dispute here is over the proper construction of Claim 3 of the '761 Patent. Claim 3 provides:

3. In a replacement light tube for a fluorescent light fixture having a light tube socket and a power supply circuit, the improvement comprising:

a plurality of closely-spaced light emitting diodes disposed inside a bulb portion of the light tube and in electrical communication with a pair of end caps coupled to opposed ends of the bulb portion and engageable with the light tube socket, the plurality of light emitting diodes operable to illuminate in response to electrical current delivered by the fluorescent light [fixture], and wherein each of the pair of end caps is an electrical bi-pin connector.

(Doc. 23, Exhibit A, col. 6, ll. 14-26) (emphasis added). The parties agree that their dispute is over the meaning of the terms, "a plurality of closely-spaced light emitting diodes." More specifically, they dispute the meaning of the phrase, "closely-spaced."

Altair offers the following construction of that term:

Multiple LEDs arranged inside of a bulb portion where the number and spacing of the LEDs is such that, when lighted, the LED's produce an illumination level and effect which adequately performs as a fluorescent tube substitute.

(Doc. 23, Exhibit B). Plaintiff's expert witness, Victor D. Roberts offers the following interpretation of the claim term "closely-spaced:" "LEDs that are spaced close enough to the adjacent LEDs so that the light emitted by the lighting device provides a substantially uniform light intensity on surfaces illuminated by the device." LEDdynamics, by contrast, offers the following, much simpler, construction:

Not spaced-apart, such that adjacent LEDs are sufficiently close that another LED cannot fit in the space therebetween.

LEDdynamics asserts that if this Court adopts its claim interpretation of "closely-spaced" LEDs, literal infringement of the patent is impossible.

Altair objects to LEDdynamics' construction on the grounds that it differs from the construction LEDdynamics disclosed, pursuant to this Court's scheduling order, on March 1, 2008. Altair argues that proper notice of the proposed interpretation was very important because the parties filed their *Markman* briefs simultaneously. In its March 2008 disclosure, LEDdynamics stated that its claim construction of the term "closely-spaced" was merely "not spaced apart." LEDdynamics' minor modification did not prejudice Altair, especially since Altair now has had another opportunity to fully brief the issue in its responsive pleading.

In defending their conflicting positions, both parties rely on the intrinsic evidence which consists of the claim itself, the specification, and the prosecution history of the patent. Altair also relies on the context of the invention, expert testimony, and its own assertions as to the ordinary meaning of "closely-spaced." LEDdynamics relies primarily on the intrinsic evidence. LEDdynamics does not rely on its own experts, but

in its response brief, has attached as exhibits the deposition testimony of inventor Ivey and of plaintiff's lighting expert, Victor D. Roberts. It also opposes Altair's construction on the grounds that plaintiff's construction does not comply with the claim language, its construction has no written description in the patent as it was originally filed, and Altair's construction is so ambiguous and indefinite as to be devoid of meaning. In its response brief, LEDdynamics further points out that there is no description anywhere in the '761 patent as to how LEDs should be arranged in order to produce any particular type of illumination, let alone the illumination emitted by a conventional fluorescent tube. LEDdynamic also argues that Altair's interpretation of the term "closely-spaced" is at odds with the prosecution history as it relates to the Schmitt patent. The Schmitt patent is prior art which the patent examiner relied upon in originally rejecting the '761 application. LEDdynamics claims that its construction is supported by the '761 patent, distinguishes the invention from the Schmitt patent, and requires no inferential conclusions.

II. STANDARD OF LAW

In 1995, the Federal Circuit Court of Appeals declared that a trial court should undertake a two-step process when determining if patent infringement has taken place: (1) determine the meaning and scope of the patent claims asserted to be infringed, and then determine if the accused product infringes upon any of the claims as properly construed. Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed.Cir.1995) (en banc), *aff'd,* 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). The job of construing the disputed claims is an undertaking for the trial court in what is now known as a *Markman* hearing, based on the seminal case of the same name. Cybor v. FAS Techs., Inc., 138 F.3d 1448, 1456 (Fed.Cir.1998). Claim construction is subject to *de novo* review by the Federal Circuit. *Id*. The language of the patent claim itself is the proper starting point. Teleflex Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1324 (Fed.Cir.2002). In *Phillips v. AWH Corp.,* 415 F.3d 1301 (Fed.Cir.2005) (en banc), *cert. denied,* 546 U.S. 1170 (2006), the Federal Circuit recently reaffirmed *Markman* and sought to explain in detailed terms the method for trial courts to follow in construing claims. In construing the claim, the district court must consider the intrinsic evidence, preferably in the following order: the claim itself, the specification, and the prosecution history. *Phillips,* 415 F.3d at 1315-19. Claim terms normally carry their ordinary and customary meaning. Teleflex, 299 F.3d at 1325; Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). The Federal Circuit has explained that the "ordinary and customary" meaning of the claim is to be interpreted with reference to "a person of ordinary skill in the art at the time of the invention." *Phillips,* 415 F.3d at 1313 (collecting cases).

"It is a 'bedrock principle' of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Id*. at 1312 (quotations omitted). Because the meaning of claim terms is often difficult to discern, however, courts turn not only to the words of the claims themselves, but to "the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles." *Id*. at 1314 (quotation omitted).

The specification is highly relevant to claim construction and is usually "the single best guide to the meaning of a disputed term." *Id*. at 1315 (quotations omitted). Claim terms can only have a meaning supported by the written description of the specification. "The importance of the specification in claim construction derives from its statutory role. The close kinship between the written description and the claims is enforced by the statutory requirement that the specification describe the claimed invention in 'full, clear, concise and exact terms.' " *Id*. at 1316 (quotations omitted). The claimed invention must actually be described in the specification. Lockwood v. American Airlines, 107 F.3d 1565, 1572 (Fed.Cir.1997).

In addition to the terms of the claim itself, and the specification, the court also considers the patent's

prosecution history to construe the claims. The prosecution history is part of the intrinsic evidence and it is instructive because it reveals how both the inventor and the Patent & Trademark Office (PTO) understood the patent. *Phillips,* 415 F.3d at 1317. Prosecution history may limit the interpretation of claims to exclude any interpretation that was disclaimed during prosecution to obtain claim allowance. Southwall Tech. v. Cardinal IG Co., 54 F.3d 1570, 1576 (Fed.Cir.1995). The prosecution history does not carry as much weight as the specification because it represents the ongoing negotiation between the inventor and the PTO rather than the final product of that negotiation. *Phillips,* 415 F.3d at 1317. The prosecution history can be especially useful if it can be shown that the inventor narrowed the scope of his invention in the course of the prosecution. *Phillips,* 415 F.3d at 1317. Amendments and arguments made to obtain the patent can limit the scope of a claim to a narrower interpretation than that which is supported by the specification. *See* Deering Precision Instr., L.L.C. v. Vector Dist. Sys., Inc., 347 F.3d 1314, 1324 (Fed.Cir.2003), *cert. denied,* 540 U.S. 1184, 124 S.Ct. 1426, 158 L.Ed.2d 88 (2004). The prosecution history 'limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." Elkay Mfg. Co. v. Ebco Mfg. Co., 192 F.3d 973, 978 (Fed.Cir.1999), *cert. denied,* 529 U.S. 1066, 120 S.Ct. 1672, 146 L.Ed.2d 482 (2000). If the specification and prosecution history conflict, the specification and claims control. Honeywell Int'l v. ITT Indus., Inc., 330 F.Supp.2d 865, 881 (E.D.Mich.2004) (citing Biogen, Inc. v. Berlax Labs., Inc., 318 F.3d 1132, 1140 (Fed.Cir.2003)).

Finally, the Court may consider extrinsic evidence, such as testimony of the inventor or experts, to construe the claim. Extrinsic evidence is not entitled to the same weight as the intrinsic evidence, but it is still useful. *Phillips,* 415 F.3d at 1317. In general, extrinsic evidence may be considered when ambiguity remains after consideration of all the intrinsic evidence, namely the claim, specification, and prosecution history. Frank's Casing Crew & Rental Tools, Inc. v. PMR Techs., Ltd., 292 F.3d 1363, 1374 (Fed.Cir.2002). In *Phillips,* the Federal Circuit explained that while the district court may in its discretion consider extrinsic evidence, it cautioned that such evidence is less reliable than the patent and its prosecution history for several reasons. 415 F.3d at 1318. First, extrinsic evidence is not part of the patent. *Id.* Second, it may not reflect the understanding of a skilled artisan in the field of the patent. *Id.* Third, unlike the patent itself, expert testimony is prepared for litigation and therefore, is subject to bias. *Id.* And fourth, there is an endless plethora of evidence that could be presented leaving the court inundated with the task of sorting the useful extrinsic evidence from the fluff. *Id.* Despite these limitations, the Federal Circuit recognized that extrinsic evidence may be helpful to the court in understanding the field of the invention and to help the court determine how a person of ordinary skill in the art would understand the claim. *Id.* at 1319.

Claims are to be construed without reference to an accused infringing device, Young Dental Mfg. Co. v. Q3 Special Prod. Corp., 112 F.3d 1137, 1141 (Fed.Cir.1997), though knowledge of the accused device can provide helpful context. Wilson Sporting Goods Co. v. Hillerich & Bradsby Co., 442 F.3d 1322, 1326-27 (Fed.Cir.2006) (collecting cases).

III. BACKGROUND

A. *The Original Application*

According to Altair, on February 11, 2000, the patent application containing the full disclosure or "specification" of the invention, including 10 figures of drawings, was first filed. LEDdynamics contends that this was a provisional patent application only and that the non-provisional application leading to the issuance of the '761 Patent was filed on February 12, 2001. LEDdynamics claims that the 2001 application has priority over the 2000 application. Thus, LEDdynamics looks to the 2001 application to construe the claim, while Altair relies on the 2000 application.

According to Altair, the patent specification describes, and Claim 3 defines the invention as a replacement for conventional fluorescent tube lights. Altair maintains that Figure 1 of the drawing in the patent shows the light tube with an array of closely-spaced LEDs 22 arranged and extending between the ends of a clear tube. Altair maintains that although no dimensions are specified, the drawing shows a light consistent with a 48-inch light typical of conventional fluorescent lights typically used in offices and schools. Altair states that the drawing shows about 50 clusters of LEDs 22, three in each cluster. Altair further maintains that Figure 2 of the patent shows one of three LEDS in each group is pointed outward while the other two are angled slightly to opposite sides. The patent specification states that the surrounding lens or "bulb portion" may be "clear" or "frosted." (Doc. 23, Exhibit A, col. 2, ll. 22-23).

According to Altair, the patent specification describes the light tube as well as electronic circuitry not relevant here. Although the patent sets forth 26 claims, the parties have focused the Court's attention on claims 1 and 3 only. According to Altair, Claim 1 describes the tube itself and emphasizes the fact that some of the LEDs are angularly offset from the circuit board on which they are mounted. It does not use the word "closely-spaced." Claim 3 uses the "closely-spaced" language but does not mention that the LEDs are angled.

LEDdynamics agrees that the specification of the '761 patent describes a light tube that includes a plurality of LEDs disposed inside a bulb portion of the tube light. LEDdynamics maintains that the manner in which the LEDs are disposed inside the bulb portion is described with respect to a single disclosed embodiment with the LEDs in groups that are "commonly referred to as a bank or array of LEDs." (Doc. 24, Exhibit 2, col. 2, ll 37-38). LEDdynamics directs the Court's attention to claims 1 and 5 of the non-provisional application which included 7 claims. Original claim 1 was amended during the prosecution and ultimately issued as independent claim 1. Original claim 1 provided:

1. A light tube for illumination by a power supply circuit comprising:

a bulb portion,

a pair of end caps disposed at opposite ends of the bulb portion, and

a plurality of light-emitting diodes disposed inside the bulb portion and in electrical communication with the pair of end caps for illuminating in response to electrical current to be received from the power supply circuit.

(Doc. 24, Exhibit 4 at 12). Original claim 5 provided:

5. In a replacement light tube for a flourescent [sic] light fixture having a light tube socket and a power supply circuit, the improvement comprising: a plurality of light-emitting diodes disposed inside a bulb portion and in electrical communication with a pair of end caps for illuminating in response to electrical current to be received from the flourescent [sic] light fixture.

(Doc. 24, Exhibit 4 at 12). LEDdynamics states that the term "closely-spaced" did not appear in the original independent claims, in any of the seven original claims, or in the application as a whole.

B. ***The Accused Device***

The Federal Circuit has allowed district courts in construing claims in a *Markman* analysis to consider the accused device. In doing so, knowledge of the accused invention may provide the court with context but the district court must be careful "not to prejudge the ultimate infringement analysis by construing claims with an aim to include or exclude an accused product." Wilson Sporting Goods, 442 F.3d at 1326.

In this case, according to Altair, the accused product is a 48-inch LED-based light tube intended for use as a replacement for a standard fluorescent tube. It contains 36 LEDs uniformly arranged between end caps and bi-pin connectors. Altair has submitted a picture of the light tube which shows that LEDs are spaced about 1.25 inches apart from one another. The accused device is different from the LEDs shown in the patent in that it uses just 36 one-watt LEDs rather than the smaller one-tenth watt LEDs shown in the patent. According to the affidavit of John S. Ivey, one of the inventors of the '761 patent, the LEDs in the accused device are flat "surface mount" devices, rather than the miniature bulb-type devises shown in the '761 patent. According to Ivey, the accused device uses a frosted or patterned "bulb portion" overlying the LEDs. Ivey also describes the accused device as involving one-watt LEDs spaced a little over an inch apart, and uses uniform spacing between LEDs and fills the entire available length of the circuit board between the end caps of the tube. Ivey testifies that the accused device "reflects the same design considerations that I went through in designing my prototype and in creating the disclosure for the '761 patent except for the fact that the LEDs are larger, and higher power devices." (Doc. 23, Exhibit F at 3). Like LEDdynamics, Altair now uses one-watt LEDs in its light tubes.

C. *The Prosecution History*

The prosecution history of the '761 patent is long and complicated. Both sides have briefed the prosecution history at length. On four occasions, the PTO rejected the patent on the grounds of prior art and the inventors amended the claims. These rejections were based on the inventions of Schmitt, Tsui, Nishaihara, and Atchinson. All of these actions are discussed separately below.

a. *The Schmitt Patent*

The parties have focused the prosecution history primarily on the Schmitt patent which seems to be the most important of all the prior art. On May 8, 2002, the PTO examiner Tran rejected original claims 1 to 7 as being anticipated by U.S. Patent No. 4,748,545 to Schmitt (the Schmitt patent). This report is known, in patent parlance, as an "Office Action." The Schmitt patent was issued on May 31, 1988 and is "prior art." Altair argues that the Schmitt patent discloses a display cabinet light which is long and tubular, has bi-pin end connectors 130, 132 associated with end caps 128 and can be used as a replacement for conventional fluorescent tubes. The Schmitt patent disclosed a fluorescent tube replacement light having spaced-apart low-voltage light sources. In response to the PTO's rejection of its proposed patent based on Schmitt, the applicants added the term "closely-spaced" to each of their original claims 1 and 5 to modify how the LEDs were spaced inside the bulb portion. According to LEDdynamics, the applicants argued that their invention differed from the Schmitt patent because of the closely-spaced nature of the LEDs. The applicants directed the examiner to Figs. 1 and 2 of the '761 patent in support of their argument to the examiner that their claims differed from the "spaced-apart" light sources of the Schmitt patent. Specifically, they argued:

Schmitt does not teach or suggest a plurality of closely-spaced light-emitting diodes extending between the opposite ends of the bulb portion, which is shown by example in Applicants' Figures 1 and 2. A critical feature of Schmitt is the existence of spaced-apart light sources as exhibited by the presence of this element in each claim of the patent. The specification explains that adequate separation assures maximum reflective

angles with respect to the object being displayed. (Col.4, ll.62-65, ll.24-28). Figure 2, by example, illustrates three spaced-apart lamps 50 mounted in spaced-apart sockets 44. Thus, Schmitt teaches away from a plurality of closely-spaced light-emitting diodes extending between the opposite ends of the bulb portion.

(Doc. 24, Exhibit 7 at 6). The applicants also amended claims 1 and 5 to add the term "closely-spaced" to describe the placement of LEDs within the bulb portion.

Altair argues that the '761 patent differed from the Schmitt patent in that the Schmitt invention did not involve LEDs, but rather low voltage incandescent lamps or halogen lamps. Altair argues that examiner Tran erred in concluding that claim 5 described Schmitt's light since there is no suggestion that his light sources are LEDs. Altair contends that the spacing of lights in Schmitt's invention is irrelevant to patent '761. Schmitt's invention involves spacing light sources in order to illuminate objects to achieve a certain brilliance effect. Despite Altair's argument now that the spacing of Schmitt's light tube was irrelevant to the '761 patent, the fact remains that the applicants of the '761 altered the claim language in response to the Office Action. On January 29, 2003, applicant's counsel, Michelle L. Knight amended pending Claim 5 (the predecessor to Claim 3 which is in dispute here) to read as follows:

5. In a replacement light tube for a flourescent (sic) light fixture having a light tube socket and a power supply circuit, the improvement comprising:

a plurality of *closely-spaced* light emitting diodes disposed inside a bulb portion of the light tube and in electrical communication with a pair of end caps coupled to opposed ends of the bulb portion and engageable with the light tube socket, the plurality of light emitting diodes operable to illuminate in response to electrical current delivered by the flourescent (sic) light fixture.

(Doc. 23, Exhibit J at 148) (amendment italicized). According to Altair, the only amendment added to distinguish Claim 5 (ultimately issued as Claim 3) from the Schmitt patent were the words "closely-spaced" to describe the placement of the LEDs. LEDdynamics, on the other hand, has directed the Court's attention to the Schmitt patent's description that "sources of illumination or lights are spaced apart from one another." (Doc. 24, Exhibit 6 at col. 4, ll. 62-68). LEDdynamics claims that this language supports its construction that "closely-spaced" means "not spaced apart."

Altair directs the Court's attention to the REMARKS section of its January 29, 2003 paper to explain the amendment. Having carefully reviewed those remarks, it is clear that they refer to Claim 1 of the patent, not Claim 5. Specifically, the remarks Altair seeks to rely upon provide in relevant part:

It is respectfully submitted that claim 1 is not anticipated or rendered obvious by Schmitt. FN1 Schmitt does not teach a plurality of light emitting diodes (LEDs), as proposed by the Examiner. The lamps of Schmitt, such as lamp 152, are identified in Schmitt as incandescent or tungsten halogen lights. (Schmitt, col.1, ll. 56-57; col.2, ll. 19-22, col. 4, ll. 24-27). Schmitt teaches away from using the relatively monochromatic light offered by individual LEDs by emphasizing that the frequencies of light generated by incandescent and halogen lights are desirable for the warmth, sparkle and brilliance they add to the objects displayed by Schmitt's illumination system when contrasted to the smaller frequency spectrum offered by fluorescent tubes.

FN1. Altair did not quote this sentence in its brief which clarifies that the Remarks refer to claim 1, not claim 5.

...

Further, even if Schmitt suggested using LEDs as its lamps, Schmitt does not teach or suggest a plurality of closely-spaced light emitting diodes extending between the opposite ends of the bulb portion, which is shown by example in Applicants' Figs. 1 and 2. A critical feature of Schmitt is the existence of spaced-apart light sources as exhibited by the presence of this element in each claim of the patent.
(Doc. 23, Exhibit J at 152). Altair argues that the first paragraph quoted above is the more important of the two and that it distinguishes the '761 patent from the Schmitt patent based on the effect of lighting to be achieved. Altair contends that paragraph 2, quoted above, is unnecessary to distinguish the '761 patent from Schmitt's invention, and in any event, must be read in context to mean that Schmitt's invention involves lights centered to coincide with the spacing of objects to be lighted, while the '761 patent involves lights extending fully between end caps.
LEDdynamics quotes more of the Remarks section of the January 29, 2003 paper to support its position that the "closely-spaced" language is critical to the patented invention and that "spaced-apart" light sources would not infringe. Specifically, LEDdynamics quotes the following language from the Remarks section, which follows that quoted by Altair above:

The specification explains that adequate separation assures maximum reflective angles with respect to the object being displayed. (Co.4, ll.62-65, Col.6, ll.24-28). Figure 2, by example, illustrates three spaced-apart lamps 50 mounted in spaced-apart sockets 44. Thus, Schmitt teaches away from a plurality of closely-spaced light emitting diodes extending between the opposite ends of the bulb portion.

(Doc. 24, Exhibit 7 at 6).

In its January 29, 2003 amendment paper to the examiner, the applicants also amended claim 1 of the patent to add the term "closely-spaced." The amendment to claim 1 reads as follows:

1. A light tube for illumination by a power supply circuit comprising

a bulb portion,

a pair of end caps disposed at opposite ends of the bulb portion, and a plurality of *closely-spaced* light emitting diodes disposed inside the bulb portion and *extending between the opposite ends of the bulb portion, the light-emitted diodes* in electrical communication with the pair of end caps for illuminating in response to electrical current [to be] received from the power supply.

(Doc. 24, Exhibit 7 at 12) (underline shows amendment in original).

The January 29, 2003 amendment paper to the examiner also amended claim 5 (the precursor to claim 3) to read as follows:

In a replacement light tube for a flourescent (sic) light fixture having a light tube socket and a power supply circuit, the improvement comprising:

a plurality of *closely-spaced* light emitting diodes disposed inside the bulb portion *of the light tube* and in

electrical communication with [the] a pair of end caps [for illuminating] *coupled to opposed ends of the bulb portion and engageable with the light tube socket, the plurality of light emitting diodes operable to illuminate* in response to electrical current [to be received from] *delivered by* the flourescent (sic) light fixture.

(Doc. 24, Exhibit 7 at 12) (underline shows amendment in original).

On April 10, 2003, examiner Tran allowed Claim 5 of the '761 patent. Altair relies on the following explanation of examiner Tran to support its position that the focus of the examiner was not only the term "closely-spaced" but on the fact that "closely-spaced' modified "LEDs" which it claims the Schmitt invention did not involve:

In particular, the art of record fails to teach or fairly suggest construing a plurality of closely [sic] light emitting diodes disposed inside a bulb portion of the light tube and in electrical communication with a pair of end caps coupled to opposed ends of a bulb portion and engageable with the light tube socket posses [sic] all of the distinctive features such as defined by independent Claim 5 to make a light tube and power supply circuit which have a long life expectancy.

(Doc. 23, Exhibit J at 142). The problem with this argument is that the term "closely-spaced" was used to differentiate the invention from Schmitt. If the only difference between the '761 patent and Schmitt was the use of the LEDs, then there would be no purpose for the term, "closely-spaced." Under Altair's construction, the term "closely-spaced" is meaningless.

2. *The Tsui Patent*

The next Office Action of the PTO involved patent 6,394,623 to Tsui (Tsui patent). Altair claims that the Tsui patent is not prior art as Altair's effective filing date was five months earlier than Tsui. Nevertheless, Altair agrees that attorney Knight submitted a Supplemental Amendment in which she distinguished Tsui from Claim 13. Tsui involved rope like lights, such as those used on Christmas trees, by using a string of serially connected LEDs of different colors visible through a clear sheath. In order to distinguish patent '761 from the Tsui patent, Knight amended Claim 1 to delete the words "closely-spaced" and argued to allow Claim 1 over the Tsui patent. Knight did not discuss or alter Claim 5, which later became Claim 3, which is at the crux of this lawsuit. In seeking to distinguish patent '761 from the Tsui patent, Knight made the following remarks:

Tsui teaches a plurality of spaced apart lights 30 located along a reflective metallic light string conductor 20. One or more main body connectors 10 extend essentially parallel to the conductor 20 and are also made of a reflective metallic material.

...

This design has as its goal the elimination of the dullness of lighting attributable to prior art rope-type designs because the only source of light is emitted at each individual light.

...

Tsui does this by maintaining the spaced apart lights of the prior art but including the exposed reflective conductors 10, 20 within the sheath 50. In contrast, the closely-spaced light emitting diodes as described by the Applicants are mounted and spaced based on the viewing range of the LEDs to obtain a predetermined

radiation pattern or dispersion of light from the tube. This provides a uniform light emitted along the length of the tube such that it is a suitable replacement for a fluorescent lighting fixture.
(Doc. 23, Exhibit J at 125). Altair contends that Tsui did not build a fluorescent tube replacement and that Knight distinguished the '761 patent from the Tsui patent on this grounds. It further contends that Knight only amended Claim 1, not Claim 5 in response to the Tsui patent. LEDdynamics, on the other hand, relies on the same remarks, quoted above, to support its proposition that "closely-spaced" means "not spaced apart."

3. ***The Nishara and Atchinson Patents***

On November 6, 1993, examiner Tran issued a third Office Action in which the allowance of Claim 5 was withdrawn and the Claim was re-rejected based on Patent No. 6,325,651 issued to Nishihara et al. and Patent No. 6,371,631 to Atchinson et al. Tran explained that the newly found patent references had all of the elements of the claimed invention of at least claims 1 and 5. On January 6, 2004, Knight responded with a further amendment to Claim 5. Claim 5 was amended as follows:

5. (Currently amended): In a replacement light tube for a flourescent [sic] light fixture having a light tube socket and a power supply circuit, the improvement comprising:

a plurality of closely-spaced light emitting diodes disposed inside a bulb portion of the light tube and in electrical communication with a pair of end caps coupled to opposed ends of the bulb portion and engageable with the light tube socket, the plurality of light emitting diodes operable to illuminate in response to electrical current delivered by the flourescent [sic] light; *and wherein each of the pair of end caps is a pair of bi-pin connector*.

(Doc. 23, Exhibit J at 92) (emphasis in original to show amendment). Altair argues that the purpose of the amendment was to add the reference to "bi-pin connectors" and had nothing to do with the spacings between lights. On April 15, 2004, Tran issued a further Office Action in which he reallowed Claims 3, 5-7 and 14-20. Altair argues that it relinquished coverage in Claim 5 to lights without bi-pin connectors.

LEDdynamics also directs the Court to Claims 1, 16, and 18 which were amended in response to the Third Office Action. Claim 1 was amended as follows:

1. A light devise for illumination by a power supply circuit comprising:

a bulb portion,

a first end cap disposed at one end of the bulb portion, and

a plurality of light-emitting diodes disposed inside the bulb portion, the light-emitting diodes in electrical communication with the end cap for illuminating in response to the electrical current received from the power supply; and wherein the plurality of light-emitting diodes is mounted on at least one circuit board; *and wherein each of the plurality of light emitting diodes is mounted at an angular off-set from the circuit board to establish a predetermined radiation pattern of light*.

(Doc. 24, Exhibit 12 at 2) (emphasis in original to show amendment).

Claims 16 and 18 were amended to include the "closely-spaced" limitation.

Altair directs the Court to the explanation of examiner Tran in allowing Claim 5, and others:

Regarding Claims 1, 3, 5, 13 and 18, the reference of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim a pair of end caps disposed at opposite ends of the bulb portion, wherein each of the end caps is an electrical bi-pin connector and specifically comprising the limitation the plurality of light emitting diodes is mounted at an angular offset from the circuit board and arranged into one of a plurality of equidistantly spaced light emitting diode banks.

(Doc. 23, Exhibit J at 48). Based on the above reasoning, Altair argues that no competitor could reasonably conclude that all of the limitations described by Examiner Tran in the above statement could be ascribed to what became Claim 3 in the issued patent. Original claims 16 and 18 were also amended and included the "closely-spaced" limitation. (Doc. 24, Exhibit 12 at 4-5).

4. ***The Fourth Office Action***

On May 24, 2004, the PTO issued a Fourth Office Action. LEDdynamics asserts that the Fourth Office action shows that the PTO recognized the importance of "closely-spaced" to the allowability of the claims. The PTO gave the following reasons for allowing claims 3, 5, 16 and 18:

The prior art of record fails to appreciate the advantage offered by light tube and power supply circuit with the following distinctive features such as set by all of the independent claims. In particular, the art of record fails to teach or fairly suggest constructing a pair of bi-pin end caps coupled opposed [sic] ends of the bulb portion and engageable with the fluorescent light tube socket, *wherein the plurality of closely-spaced light-emitting diode banks disposed inside* a bulb portion of the light tube possess [sic] all of the distinctive features such as defined by independent claims 3,5,16 and 18.

(Doc. 24, Exhibit 13 at 5) (emphasis added). The PTO rejected original independent claim 1 that no longer included the term, "closely-spaced." In response to the Fourth Office Action, the Applicants made minor amendments to claim 1, 16 and 18 but did not alter claims 3 and 5. The PTO allowed the application explaining the allowance of claims 1,3,5, 13 and 18:

Regarding claims 1, 3, 5, 13 and 18 the references of the Prior Art of record fails [sic] to teach or suggest the combination of the limitations as set forth in claim a pair of end caps disposed at opposite ends of the bulb portion, wherein each of the end caps is an electrical bi-pin connector and specifically comprising the limitation the plurality of light-emitting diodes is mounted at an angular off set from the circuit board and arranged into one of a plurality of equidistantly spaced light-emitting diode banks.

(Doc. 24, Exhibit 15 at 2).

The '761 patent issued with 26 claims. Original claim 5 became claim 3 which is the claim in dispute. The issued patent includes the term "closely-spaced" in claims 1, 2 (original claim 3), 3 (original claim 5), 13 (original claim 16), and 15 (original claim 18). In each of these claims, the term "closely-spaced" modifies the spacing of LEDs. The specification does not use the term "closely-spaced."

IV. ANALYSIS

A. ***Intrinsic Evidence***

1. ***The Claim***

The first place this Court begins in conducting its *Markman* analysis is the claim itself. *Phillips,* 415 F.3d at 1312. The disputed claim is independent claim 3 which provides:

3. In a replacement light tube for a fluorescent light fixture having a light tube socket and a power supply circuit, the improvement comprising:

a plurality of **closely-spaced** light-emitting diodes disposed inside a bulb portion of the light tube and in electrical communication with a pair of end caps coupled to opposed ends of the bulb portion and engageable with the light tube socket, the plurality of light emitting diodes operable to illuminate in response to electrical current delivered by the fluorescent light; and wherein each of the pair of end caps is an electrical bi-pin connector.

(Doc. 23, Exhibit A, col. 6, ll. 14-26) (emphasis added). In deciding what the disputed claim term, "closely-spaced" means, the Court considers the ordinary and customary meaning of the term to one skilled in the art, which in this case, is the lighting industry. *Id*. at 1313. The term "closely-spaced" does not appear to have an ordinary and customary meaning to those involved in the lighting industry. LEDdynamics argues that the indefiniteness of the term "closely-spaced" cannot be understood without resort to the specification and prosecution history.

Altair argues that the term gleans its meaning from the context of the invention which it claims was to "provide an LED-based tube light tube (sic) that replaces a fluorescent tube light physically and with respect to lighting effect." (Doc. 23, p. 16). Altair argues that the "closely-spaced" term should be construed so that as technological advances give LEDs greater illumination capacity, the spacing may increase as long as the LEDs extend over the entire length of the tube, is within the bulb portion, and results in an illumination effect that emulates a conventional fluorescent tube light. In essence, Altair argues that the "closely-spaced" language does not apply when higher-wattage LEDs are used.

LEDdynamics argues that the claim language does not define what "closely-spaced" means. LEDdynamics argues that the language is ambiguous because it is necessarily relative to varying distances between objects. For example, LEDdynamics argues that the moon and the sun are closely spaced relative to the universe but not from the perspective of designing a rocket to travel between them. Given the alleged ambiguity of the term, "closely-spaced," LEDdynamics argues that the Court should focus its attention primarily on the specification and prosecution history to determine its meaning.

Altair, on the other hand, argues that the context of the invention can help the Court to glean the meaning of the phrase "closely-spaced." Altair argues that the objective of the invention is to provide an LED-based light tube that replaces a fluorescent tube light physically and with respect to lighting effect. LEDdynamics vigorously disputes that the patented invention covers "lighting effect." Altair seems to argue that any configuration of the LEDs is permissible under claim 3 as long as the light is an "adequate" replacement for a fluorescent tube light. This interpretation renders the term "closely-spaced" an absolute nullity. LEDdynamics' construction is the only one advanced that would not invalidate the claim as being indefinite. The Federal Circuit recently explained that "[b]ecause claims delineate the patentee's right to exclude, the patent statute requires that the scope of the claims be sufficiently definite to inform the public of the bounds

of the protected invention, i.e., what subject matter is covered by the exclusive rights of the patent." Halliburton Energy Serv., Inc. v. M-I LLC, 514 F.3d 1244 (Fed.Cir.2008). Without definiteness, competitors lack notice of the scope of the invention and are erroneously subject to infringement.

Altair argues that its invention was intended to act as an "adequate" replacement for a conventional fluorescent light which it alleges means that it would provide the same illumination level and effect. In support of this position, Altair relies on the "preamble" to Claim 3 which states that the invention covers "a replacement light tube for a fluorescent light fixture having a light tube socket and a power supply circuit." (Doc. 23, Exhibit A, col. 6, ll. 14-18). This language fails to support Altair's position. It merely provides that its invention may be used where there is a fluorescent light fixture having a light tube socket. It says nothing about illumination effect.

Altair's requirement of "adequacy"-which is not set forth in the '761 patent claims or specification-would allow *any* spacing of LEDs, closely or widely. Also, Altair's proposed construction would require a different analysis of infringement for each application of the light device. For example, fluorescent lights can be found in a broad range of areas, varying from lights used on carnival rides, in factories, in refrigerators to lights used in offices or desk lamps. Each of these different types of fluorescent lighting would involve different illumination characteristics. Some lights, like those used in carnival rides, would be mounted so that the light is illuminated in all directions, in other words, 360 degrees, whereas an office light would involve lights in only one direction. A different infringement analysis would be required for each desired use of the tube light. Such a result renders Altair's proposed construction invalid as indefinite.

Altair argues that the spacing depends on the wattage of the LEDs used. Since a traditional or conventional fluorescent tube light produces about 2850 lumens of light, Altair maintains that LED-based replacement must provide that same amount of light albeit in any power of LEDs. For example, the designer of the LED-based tube light may use lower power one-tenth watt LEDs that produce fewer lumens of light or higher power one watt LEDs that produce about ten times the amount of lumens. If the lower power one-tenth watt LEDs are used, it will take many more LEDs inside the bulb than if the one-watt LEDs are used and thus, presumably, the LEDs will be more closely spaced. If the higher power LEDs are used, less LEDs will be placed within the bulb, and presumably, this will result in the LEDs being spaced farther apart than if the lower wattage LEDs are used. Under Altair's construction of the term "closely spaced," the amount of space between LEDs depends on the power or wattage of the LEDs used. This construction of the term "closely-spaced" does not appear to comport with its ordinary and customary meaning. Rather, Altair's construction renders the term "closely-spaced" meaningless. Its construction is the epitome of indefiniteness.

Nowhere in Claim 3 is it stated that the light tube would provide the same type of illumination as a conventional fluorescent light tube. The term "closely-spaced" says nothing about the quality or quantity of illumination. Altair's proposed functional definition for the term, "closely-spaced," lacks the written description required by 35 U.S.C. s. 112, para. 1. LEDdynamics argues that to make the inferential leap would allow any inventor to improperly expand his invention years after the patent was issued to chill competition from similar non-infringing inventions. The Court finds this argument compelling.

This Court finds that the term "closely-spaced" as used in Claim 3 is ambiguous and indefinite; thus, the Court will rely on the specification and prosecution hearing to determine its meaning.

2. *The Specification*

The Court next considers the specification which is also sometimes referred to as the description of the patent or the narrative portion of the patent application. According to *Phillips,* the specification is highly relevant to claim construction and is usually "the single best guide to the meaning of a disputed term." *Id*. at 1315 (quotations omitted). 35 U.S.C. s. 112 describes the specification as follows:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Id.

Altair takes the position that the specification does not address the meaning of the term "closely-spaced" as that term appears nowhere in the description of the patent. LEDdynamics, on the other hand, argues that the figures and drawings of the invention contained in the specification support the meaning that "closely-spaced" means "not spaced-apart, such that adjacent LEDs are sufficiently close that another LED cannot fit in the space therebetween." This is so based on the close proximity of groups of LEDs.

LEDdynamics argues that Figures 1 through 3 support its construction of "closely-spaced." Figure 1 shows light tube 20 which is lit by LEDs 22 packaged inside the light tube. (Doc. 24, Exhibit 2 at col. 2, lines 15 to 24). The description of Figure 1 shows that the LEDs are mounted to a circuit board 30. LEDdynamics concedes that Figure 1 does not disclose anything relating to the spacing of LEDs 22.

Figure 2 shows a perspective view of the LEDs 22 of Figure 1 mounted on a circuit board 30. The description of Figure 2 discloses that the LEDs 22 are arranged in groups, which are referred to as banks or arrays. (Doc. 24, Exhibit 2 at col. 2, lines 36 to 37). LEDdynamics argues that the description of the arrangement of LEDs 22 in groupings supports the conclusion that the LEDs must be "closely-spaced" to be arrayed as a group. The entire written description of Figure 2 provides:

FIG. 2 is a perspective view of the LEDs mounted on the circuit board 300. A group of LEDs 22, as shown in FIG. 2, is commonly referred to as a **bank or array of LEDs.** Within the scope of the present invention, the light tube 20 may include **one or more banks or arrays of LEDs 22** mounted on one of more circuit boards 30. In a preferred embodiment of the present invention, the LEDs 22 emit white light and, thus, are commonly referred to in the art as white LEDs. In FIGS. 1 and 2, the LEDs 22 are mounted to one surface 32 of the circuit board 30. In a preferred embodiment of the present invention, the LEDs 22 are arranged to emit or shine white light through only one side of the bulb portion 24, thus directing the white light to a predetermined point of use. This arrangement reduces light losses due to imperfect reflection in a conventional lighting fixture. In alternative embodiments of the present invention, LEDs 22 may also be mounted, in any combination, to the other surfaces 34, 36 and/or 38 of the circuit board 30.

(Doc. 24, Exhibit 2, col. 2, ll. 35-52) (emphasis added). Fig. 2 shows that the LEDs are positioned such that another LED cannot be positioned between them.

FIG. 3 shows a cross section view of FIG. 2. (Doc. 24, Exhibit 2 at col. 2, ll 54-64). It does not discuss spacing of LEDs. It describes the structural strength along the length of light tube 20 being provided by H-shaped circuit board 30. The description provides that a predetermined radiation pattern or dispersion of light from light tube 20 is achieved by mounting each LED 22 at an angle relative to adjacent LEDs and/or

the mounting surface 32 of circuit board 30. LEDdynamics argues that there is no description or teaching in the application of any specific patterns of light. Moreover, there is no discussion of spacing or the number of LEDs. There also is no discussion concerning whether the type of illumination that is omitted by the invention should be the same as that of a conventional fluorescent tube.

LEDdynamics also argues that claims 4 through 10 do not disclose anything related to the spacing of LEDs 22. LEDdynamics argues that FIGs. 1 through 3, read in conjunction with the description of FIG.2, support its construction of the term "closely-spaced." FIGs. 1 to 3 show three angularly off-set LEDs grouped together. LEDdynamics argues that a "group" or "bank" of LEDs cannot exist unless the groups are spaced closely relative to each other but spaced apart relative to an adjacent group of LEDs in the next bank. LEDdynamics argues that the description of FIG. 2 in conjunction with the illustrations of the groupings in FIGs. 1 through 3 shows that LEDs within the same group are spaced so closely to one another that an additional LED would not fit between two adjacent LEDs in the same group. In sum, LEDdynamics argues that the specification itself supports its construction of closely-spaced to mean that the LEDs are spaced so closely to one another that another LED would not fit between them.

Altair argues that the figures and drawings of the specification are illustrative only. It claims that the drawings used in the patent application used low level LEDs because that is what was commercially available at the time. Altair asserts that changes in the lighting industry, since the patent was conceived around 1999, have altered the manufacture of its invention. At the time of its conception, Altair used low power LEDs which rated about one-tenth watt in power consumption. Today, higher power LEDs are common in the industry. The new LEDs can be spaced farther apart in a tube because less LEDs are required to produce the same lighting effect.

Altair argues that the illustrations set forth in the specification, involving one-tenth watt LEDs, are only one example of one embodiment of the invention and cannot be interpreted to limit the claim to the low powered LEDs spaced closely together. Altair asserts that the scope of the invention cannot be limited to the illustrations set forth in the specification. In support of this argument, Altair directs the Court's attention to *Phillips, supra,* and *Teleflex, supra, inter alia*.

In *Phillips,* the Federal Circuit explained that the purpose of the specification is "to teach and enable those of skill in the art to make and use the invention." 415 F.3d at 132. Oftentimes, the specification merely sets forth one embodiment of the invention and will be merely exemplary in nature. *Id*. Other times, the patentee intends for the claims and specification to "be strictly coextensive." *Id*. In *Teleflex,* the Federal Circuit explained that "the number of embodiments disclosed in the specification is not determinative of the meaning of disputed claim terms." 299 F.3d at 1327. Even when the specification sets forth only one example of the preferred embodiment, this does not limit the claims of the patent to that embodiment. Id. at 1328; *Phillips,* 415 F.3d at 1323.

In *Teleflex,* the Federal Circuit found that the district court erred by limiting the scope of the invention to the embodiment described in the specification instead of using the specification merely as context. 299 F.3d at 1328. The Federal Circuit has "cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification." *Id*. (quotations and citations omitted).

In this case, the Court has considered the illustrations of the preferred embodiment in Figs. 1 to 3 and finds that they are helpful, but not dispositive, of the claim construction decided here. Although the descriptions do not state that the LEDs must be closely spaced, the figures show the LEDs arranged in banks or groups,

and within those groupings the LEDs are spaced so closely to one another that an additional LED may not be placed between them. Within the context of the claim language, which includes the term "closely-spaced," the specification offers some persuasive support for LEDdynamics' claim construction. Nothing in the specification describes illumination level, lighting effect, or specific patterns of light, which could be tied to the spacing of LEDs. The term "closely-spaced" has nothing to do with functionality of the invention but with the spatial relationship between LEDs.

Altair argues that the specification allows for any spacing of LEDs based on the "DESCRIPTION OF THE PREFERRED EMBODIMENT" which provides:

Within the scope of the present invention, the light tube 20 *may include* one or more banks or arrays of LEDs 22 mounted on one or more circuit boards 30.

...

In alternative embodiments of the present invention, LEDs 22 may also be mounted, *in any combination* to the other surfaces 34,36 and/or 38 of the circuit board 30.
(Doc. 23, Exhibit A at col. 2, ll. 39-41, 51-53) (emphasis added by Altair). Altair's attempt to cast such a broad net over the scope of the invention is belied by the prosecution history discussed below.

3. *The Prosecution History*

a. *The Schmitt Patent*

The Court next considers the prosecution history in fleshing out the term "closely-spaced." The Applicants modified the '761 patent several times in response to the PTO's rejection of the patent based on prior art. These amendments provide the Court with fertile ground for ascertaining exactly what "closely-spaced" means. The Court first considers the Schmitt patent which was the basis for the first rejection of the '761 patent. The parties have competing views about the scope of the Schmitt patent. There is, however, no dispute that the inventors added the "closely-spaced" language to distinguish the '761 patent from the Schmitt patent which used the "spaced apart" phrase.

LEDdynamics argues that the Schmitt patent describes a direct replacement tube for a fluorescent light tube. Altair maintains that only its invention involved a fluorescent light tube and that the Schmitt patent covered concentrated, point sources of light. FN2 Altair's argument that the Schmitt patent covered an entirely different invention is not particularly compelling in light of the PTO's rejection of its patent on the basis of the Schmitt invention. In its brief, Altair argues that examiner Tran "was wrong in concluding that the pending Claim 5 (the predecessor to Claim 3) literally described Schmitt's light." Altair would have this Court ignore the addition of the language "closelyspaced" as irrelevant on the grounds that the Schmitt patent is unrelated to its invention. This interpretation would ignore the PTO's rejection of the ' 761 patent on the basis of Schmitt's invention and would render the amendment of Claim 3 to include the term "closely-spaced" meaningless.

FN2. In its response brief, Altair argues that Schmitt's invention involved spacing between halogen light sources of approximately five to seven inches, based on the dimensions and drawings of the invention. (Doc. 23, Exhibit H).

Altair argues that the Schmitt patent distinguishes its invention from fluorescent tube lights. Specifically,

Altair quotes the Schmitt patent which provides:

BACKGROUND OF THE INVENTION

Light fixtures or illumination fixtures for use in display cabinets are well-known. Typically, these fixtures incorporate fluorescent tubes mounted within a reflective housing ... On the other hand, the frequency spectrum of the light generated by fluorescent tubes may not include all of the frequencies found in light generated by incandescent lamps. Further, a fluorescent tube produces a broad, flat illumination rather than the highly reflective, concentrated point light sources produced by incandescent lamps. Hence, in certain type of displays, particularly of jewelry, fluorescent lighting is less popular.

(Doc. 23, Exhibit H col. 1 ll. 10-15 and II. 20-28). The Court is not persuaded by the argument that the Schmitt invention is distinguishable from the '761 patent based on the type of light emitted, be it "point sources of light" or "broad, flat illumination" as this distinction is not what persuaded examiner Tran to allow the '761 patent to issue. If this distinction were dispositive, there would have been no reason for the "closely-spaced" language to be added to Claim 3. In any event, it appears that Schmitt, much like Altair, sought to replace conventional fluorescent tube lights with his invention. The Schmitt patent states that the replacement tube "is intended as a direct replacement for a correspondingly, physically-sized, fluorescent tube." (Doc. 24, Exhibit 6 at col. 7,1 16-19). LEDdynamics argues that differentiating the '761 patent from the Schmitt patent favors its interpretation that "[l]ight emitting diodes that are spaced such that an additional light-emitting diode cannot be placed between."

Altair argues that the Examiner who rejected Claim 3, based on the prior art of Schmitt, made a mistake in taking the position that Schmitt involved LEDs. (Doc. 23, Exhibit J at 171). Even taking as true Altair's argument that the Examiner erred in finding that Schmitt involved LEDs, there is no dispute that Altair's counsel distinguished Schmitt based on "closely-spaced" LEDs as opposed to the "spaced apart" light sources of Schmitt. (Doc. 23, Exhibit J at 152.

LEDdynamics correctly points out that the '761 patent is silent on the issue of illumination level and effect. LEDdynamics states that the light tube of the Schmitt patent has the same physical configuration and dimensions as the light tube of the '761 patent. The light tube of the Schmitt patent may be mounted directly to a conventional fluorescent fixture but its light sources are distinct from a fluorescent bulb. It has a "sparkle and brilliance" design for illuminating objects in cabinets which is distinct from conventional fluorescent lighting. Given this distinction, LEDdynamics argues that Schmitt teaches that just because a light tube is designed to be a direct physical replacement for a fluorescent light tube does not translate to a finding that the light tube provides the same illumination as that provided by the fluorescent light tube that it replaced. LEDdynamics argues that if the '761 applicants wanted to distinguish their patent from the Schmitt patent on the basis of illumination level and effect, they were free to do so. But they did not. The applicants only distinguished the physical spacing of the light sources in the two inventions by using the term "closely-spaced." LEDdynamics very persuasively argues that "closely-spaced" has nothing to do with illumination level, but has only an ordinary meaning based in physical spacing. In sum, the '761 patent only issued after the "closely-spaced" language was added to distinguish the invention from Schmitt. Considering this amendment in its context is very compelling evidence in support of LEDdynamic's claim construction that "closely-spaced" means "not spaced apart."

b. ***The Tsui Patent***

The Court next considers the Tsui patent. The Tsui patent covers an elongated rope light commonly used in Christmas tree lights. It describes the rope light as including "spaced-apart" light sources. (Doc. 24, Exhibit 9 at col. 1, ll. 57-60). The Tsui patent does not describe what is meant by "spaced apart." In response to the rejection of the '761 patent claims based on the Tsui patent, the '761 Applicants differentiated their patent from the Tsui patent based on the "closely-spaced" lights of their claim from the prior art lights that were "spaced-apart." In seeking to differentiate the '761 patent from the Tsui patent, Altair's attorney stated:

First, Tsui fails to teach or suggest a plurality of closely-spaced light emitting diodes disposed inside the bulb portion as previously included in claim 1. Tsui teaches a plurality of spaced-apart lights 30 located along a reflective, metallic light string conductor 20.... Tsui does this by maintaining the spaced-apart lights of the prior art ... In contrast, the closely-spaced light emitting diodes as described by the Applicants are mounted and spaced based upon the viewing range of the LEDs to obtain a predetermined radiation pattern or dispersion of light from the tube. This provides a uniform light emitted along the length of the tube, such that it is a suitable replacement for a fluorescent lighting fixture.

(Doc. 24, Exhibit 10 at 7 and Doc. 23, Exhibit J at 125). Altair argues that the above statement by its attorney was meant to have a functional definition that the LEDs be arranged so that the LED tube light would function as an adequate substitute for a fluorescent tube light. Altair's suggested "functional" definition would render the term "closely-spaced" meaningless. Once again, Altair is arguing that any spacing would be allowed as long as the end result is a light that can replace a fluorescent tube light. Such a broad definition defies the ordinary meaning of the term "closely-spaced," the specification, and the prosecution history. Altair distinguished its '761 patent from the Tsui patent based on the fact that its LEDs were "closely-spaced," not "spaced apart" as the Tsui patent. Altair is estopped from now arguing to the contrary that the "closely-spaced" language meant nothing.

B. ***Extrinsic Evidence***

Altair relies on extrinsic evidence in support of its claim construction. Extrinsic evidence is not entitled to the same weight as the intrinsic evidence, but it is still useful. *Phillips,* 415 F.3d at 1317. Expert testimony may be helpful to the court in understanding the field of the invention and to help the court determine how a person of ordinary skill in the art would understand the claim to mean. *Id*. at 1319. LEDdynamics relies on the intrinsic evidence only which is comprised of the claims, the specification, and the prosecution history. Altair relies on the affidavit of inventor and Altair employee John Ivey and the testimony of lighting expert Dr. Victor Roberts. In its response brief, LEDdynamics also seeks to rely on the deposition testimony of Ivey and Roberts to support its competing position.

Ivey's sworn statement is that LED spacing is a function of LED power level. (Doc. 23, Exhibit F at 3). Ivey explains that at the time he invented the ' 761 patent, low power (1/10) watt LEDs were commonly available and thus he used that size for his invention. If higher power LEDs were used, like those used by LEDdynamics, the LEDs are spaced farther apart. Ivey claims that although the LEDs in his invention were spaced closely together, his patent would cover higher wattage LEDs spaced farther apart as the invention covers a replacement for a conventional fluorescent tube light. (Doc. 23, Exhibit G at 2-4). It is Altair's position that the spacing between LEDs in patent '761 is flexible and the spacing is whatever is necessary to achieve a replacement for fluorescent tube lights.

LEDdynamics disputes Ivey's declarations. It cites to Ivey's deposition where he admits that Altair's construction of Claim 3 requires an inference not expressly set forth in the claim. (Doc. 32, Exhibit A at

103-117).

In his report, alleged lighting expert Dr. Victor Roberts states that "close" is a relative term which draws its meaning from the context in which it was used. (Doc. 23, Exhibit G at para. 20). By way of example, he states that cars on the highway separated by twenty to forty feet might be considered closely spaced, but if separated by the same distance in a parking lot, would not be considered closely spaced. (Doc. 23, Exhibit G at para. 21). The problem with this analogy is that the specification of the '761 patent includes drawings of the LEDs which shows them to be so closely spaced that another LED could not be fit between them. Dr. Roberts states that "closely-spaced" means, "LEDs that are spaced close enough to the adjacent LEDs so that the light emitted by the lighting device provides a substantially uniform light intensity on surfaces illuminated by the device." (Doc. 23, Exhibit G at para. 23). Dr. Roberts' testimony is not convincing in light of the claim, specification, and prosecution history, all of which support LEDdynamics' construction of the ' 761 patent. Altair's position seems to work backwards believing that the first consideration is what light is emitted by the lighting device and that end result dictates how closely the LEDs need to be placed relative to one another. Under this construction, the '761 patent covers any spacing of LEDs as long as the end result is a light tube that is a replacement for a conventional fluorescent light. This construction ignores the fact that Claim 3 specifically requires that the LEDs be "closely-spaced." The prosecution history reveals that the modifier "closely-spaced" was added after the patent application was rejected based on the prior art of the Schmitt patent.

While LEDdynamics reserves the right to disqualify Dr. Roberts from providing opinion testimony, it alleges that Roberts' own deposition testimony supports its claim construction and not that set forth by Altair. Roberts testified at his deposition that the term "closely-spaced" was added to distinguish the '761 patent from the Schmitt invention. Specifically, LEDdynamics cites to the following testimony of Roberts:

closely spaced distinguishes this invention from Schmitt, in which he uses another phrase. And he describes, he teaches specifically in his patent what his phrase means, the "spaced apart" phrase; to provide separate light sources to provide maximum brilliance and reflection, as you get from individual incandescent light sources, for example, lighting jewelry, but that's a case where brilliance and the point character of incandescent light sources is important.

And the phrase "closely spaced" was added because of Schmitt and his existing patents and his words, "spaced apart." And as your original definition said, "closely spaced" is not "spaced apart." AndI agree, it's not Schmitt.

(Doc. 32, Exhibit B at 101).

Although expert testimony is entitled to some consideration, where, as here, the expert testimony conflicts with all of the intrinsic evidence, it is not persuasive. This is especially true where portions of the deposition testimony of inventor Ivey and Altair's expert appear to support LEDdynamics' claim construction.

CONCLUSION

Based on a careful review of Claim 3, the specification, the prosecution history, and the expert testimony, this Court is persuaded to adopt LEDdynamics' construction of Claim 3. Under this construction, the term "closely-spaced," as used in Claim 3, means "not spaced-apart, such that adjacent LEDs are sufficiently close that another LED cannot fit in the space therebetween."

E.D.Mich.,2008.
Altair Engineering, Inc. v. LEDdynamics, Inc.

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