

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

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KONINKLIJKE PHILIPS N.V. AND)	
PHILIPS LIGHTING NORTH AMERICA)	
CORP.,)	
)	
Plaintiff,)	Civil Action No. 14-12298-DJC
)	
v.)	
)	
WANGS ALLIANCE CORPORATION, d/b/a)	
WAC LIGHTING CO.,)	
)	
Defendants.)	
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MEMORANDUM AND ORDER

CASPER, J.

December 11, 2017

I. Introduction

In this patent dispute, Plaintiffs Koninklijke Philips N.V. and Philips Lighting North America Corporation (collectively, “Philips”) alleges that Wangs Alliance Corporation (“WAC”) is engaged in activities that infringe eight light emitting diode (“LED”) related patents: United States Patents Nos. 6,147,458 (“the ‘458 patent”), 6,250,774 (“the ‘774 patent”), 6,561,690 (“the ‘690 patent”), 6,586,890 (“the ‘890 patent”), 6,788,011 (“the ‘011 patent”), 7,038,399 (“the ‘399 patent”), and 7,352,138 (“the ‘138 patent”) (collectively, the “Patents-In-Suit”).¹ The parties seek construction of disputed claims terms. The Court conducted a Markman hearing prior to staying this case for *inter partes* review (“IPR”) before the Patent Trial and Appeal Board (“PTAB”) and

¹ The parties are in agreement about the construction of terms in the ‘774 patent. D. 60 at 3 n.1. Patent No. 6,013,988 (“the ‘988 patent”) has been withdrawn. D. 174 at 5.

then solicited and considered counsel’s supplemental filings, D. 174, 178, 179. With this backdrop, the Court’s claim construction as to the remaining twelve disputed terms now follows.

II. Patents-in-Suit

This lawsuit involves patents that are directed to circuitry, optics and multicolored-lighting technologies contained within lighting products and systems that employ light-emitting diodes (“LEDs”) for illumination. See, e.g., ‘011, D. 30-6; ‘138, D. 30-8; see also D. 30 ¶ 6.

Patents ‘458, ‘690 and ‘890 relate to circuitry technology that controls the power feed to the LEDs. Tr. 1:5.² The ‘458 patent, “Circuit Arrangement and Signalling Light Provided with the Circuit Arrangement,” was filed on June 29, 1999 and issued on November 14, 2000. D. 30-2. The ‘690 patent, “Luminaire Based on the Light Emission of Light-emitting Diodes,” was filed on August 20, 2001 and issued on May 13, 2003. D. 30-4. The ‘890 patent, “LED Driver Circuit with PWM Output,” was filed on December 5, 2001 and issued on July 1, 2003. D. 30-5.

Patents ‘011 and ‘399 pertain to optics technology that affect LED light emission characteristics and illumination. Tr. 1:5. The ‘011 patent, titled “Multicolored LED Lighting Method and Apparatus,” was filed on October 4, 2001 and issued on September 7, 2004. D. 30-6. The ‘399 patent, titled “Methods and Apparatus for Providing Power to Lighting Devices,” was filed on May 9, 2003 and issued on May 2, 2006. D. 30-7. Patent ‘138 pertains to multicolored-lighting technology that enables and controls the mixing of LEDs of different colors. Tr. 1:5. The ‘138 patent, also titled “Methods and Apparatus for Providing Power to Lighting Devices,” was filed on April 18, 2006 and issued on April 1, 2008. D. 30-8. It is a continuation of the ‘399 patent. Id.

² References to the Markman hearing transcript are abbreviated as “Tr. __: __,” with the first number representing the relevant day of hearing and the second number referencing the specific page (or pages) of the transcript.

III. Procedural History

Philips instituted this action on May 28, 2014, D. 1, and filed an amended complaint on January 12, 2015. D. 30. On February 20, 2015, both parties filed preliminary claim construction briefs. D. 35; D. 40. The Court held a Markman hearing over the course of two days. D. 80, 87. Shortly after the first day of the Markman hearing, on May 28, 2015, WAC filed IPR petitions, challenging the validity of every asserted claim in seven of the eight patents-in-suit, D. 95 at 12, and then on June 16, 2015, moved to stay this case, D. 94. The Court allowed the motion and the matter was stayed until after the PTAB issued its IPR rulings. D. 156. After the IPR rulings and the parties' unsuccessful attempt at mediation, D. 170-71, the parties asked the Court to return to matter of claim construction and the Court allowed the parties to file supplemental briefing, including an updated claim construction chart indicating whether the parties' respective positions about construction changed before the PTAB and considered further arguments regarding same.

IV. Standard of Review

The construction of disputed claim terms is a question of law. Markman v. Westview Instruments, 517 U.S. 370, 372 (1996). For claim construction, courts must construe “the meaning that the term would have to a person of ordinary skill in the art in question at the time of . . . the effective filing date of the patent application.” Phillips v. AWH Corp., 415 F.3d 1303, 1313 (Fed. Cir. 2005). To do so, the Court must look to “the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” Id. at 1314 (quoting Innova/Pure Water, Inc. v. Safari Water Filtration Sys., 381 F.3d 1111, 1116 (Fed. Cir. 2004)).

A. The Claims

The analysis begins with the language of the claim which “define[s] the invention to which the patentee is entitled the right to exclude.” Id. at 1312 (citing Innova, 381 F.3d at 1115). “[T]he context in which a term is used in the asserted claim can be highly instructive.” Id. at 1314. Courts may find that the claim itself provides the means for construing the term where, for example, the claim term is used consistently throughout the patent. Id. In that case, “the meaning of a term in one claim is likely the meaning of that same term in another.” Abbott GmbH & Co., KG v. Centocor Ortho Biotech, Inc., No. 09-11340-FDS, 2011 WL 948403, at *3 (D. Mass. Mar. 15, 2011) (citing Phillips, 415 F.3d at 1314). Furthermore, “the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.” Phillips, 415 F.3d at 1315.

1. Means-Plus-Function Claim Limitations

A claim limitation may be expressed in a means-plus-function format under 35 U.S.C. § 112 ¶ 6,³ which provides:

[a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

“Thus, § 112, ¶ 6 operates to restrict claim limitations drafted in such functional language to those structures, materials, or acts disclosed in the specification (and their equivalents) that perform the claimed function.” Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 703 (Fed. Cir. 1998); see MobileMedia Ideas LLC v. Apple Inc., 780 F.3d 1159, 1169 (Fed. Cir. 2015)

³ Paragraph 6 of 35 U.S.C. § 112 was replaced with § 112(f) when § 4(c) of the America Invents Act (“AIA”), Pub. L. No. 112–29, took effect on September 16, 2012. Because the applications resulting in the patents at issue in this case were filed before that date, the Court will refer to the pre-AIA version of § 112.

(noting that “[a] disclosed structure is a ‘corresponding structure’ only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim”). The use of the word “means” creates a presumption that § 112, ¶ 6 applies and, conversely, the failure to use the word “means” creates a presumption that § 112, ¶ 6 does not apply. Personalized Media Commc’ns, LLC, 161 F.3d at 703-04; see Allen Eng’g Corp. v. Bartell Indus., Inc., 299 F.3d 1336, 1347 (Fed. Cir. 2002). This presumption may be overcome in two ways. Allen Eng’g Corp., 299 F.3d at 1347. “First, a claim element that uses the word ‘means’ but recites no function corresponding to the means does not invoke § 112, ¶ 6.” Id. “Second, even if the claim element specifies a function, if it also recites sufficient structure or material for performing that function, § 112, ¶ 6 does not apply.” Id.

B. The Specification

The claims “do not stand alone” but “are part of a fully integrated written instrument, consisting principally of a specification,” which “is always highly relevant to the claim construction analysis.” Phillips, 415 F.3d at 1315. “Usually, [the specification] is dispositive; it is the single best guide to the meaning of a disputed term.” Id. (citing Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “[T]he scope and outer boundary of claims is set by the patentee’s description of his invention” and, therefore, “claims cannot be of broader scope than the invention that is set forth in the specification.” On Demand Mach. Corp. v. Ingram Indus., 442 F.3d 1331, 1338 (Fed. Cir. 2006); see Phillips, 415 F.3d at 1315–1317, 1323 (noting that “the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim,” but “expressly reject[ing] the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment”). The Court must

“us[e] the specification [only] to interpret the meaning of a claim,” however, and must be careful not to “import[] limitations from the specification into the claim.” Phillips, 415 F.3d at 1323. This standard may “be a difficult one to apply in practice,” id., but “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” Id. at 1316 (quoting Renishaw PLC v. Marposs Societa’ per Azioni, 158 F.3d 1243, 1250 (Fed. Cir.1998)).

C. The Prosecution History

After the claims and the specification, “a court should also consider the patent’s prosecution history, if it is in evidence.” Id. at 1317 (quoting Markman, 52 F.3d at 980) (internal quotation mark omitted). “Like the specification, the prosecution history provides evidence of how the [United States Patent and Trademark Office] and the inventor understood the patent” and “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” Id. (citing Vitronics, 90 F.3d at 1582–83). The prosecution history should be given less weight than the claims and the specification, however, because “it often lacks clarity . . . and is thus less useful for claim construction purposes.” Id.

D. Extrinsic Evidence

Courts may also consider extrinsic sources, which “can help educate the court regarding the field of the invention and can help the court determine what a person of ordinary skill in the art would understand claim terms to mean.” Id. at 1319. “[W]hile extrinsic evidence can shed useful light on the relevant art,” however, “it is less significant than the intrinsic record in determining the legally operative meaning of claim language.” Id. at 1317 (citations and internal

quotation marks omitted). Therefore, extrinsic evidence is “unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” Id. at 1319.

E. Indefiniteness

A patent claim is invalid for indefiniteness if its claims, when read in light of the specification and the prosecution history, “fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” Nautilus, Inc. v. Biosig Instruments, Inc., ___ U.S. ___, 134 S.Ct. 2120, 2124 (2014). This standard has displaced the prior “insolubly ambiguous” standard. Id. “The definiteness requirement must take into account the inherent limitations of language, but at the same time, the patent must be precise enough to afford clear notice of what is claimed, thereby apprising the public of what is still open to them.” Fairfield Indus., Inc. v. Wireless Seismic, Inc., No. 4:14-CV-2972, 2015 WL 1034275, at *4 (S.D. Tex. Mar. 10, 2015) (quoting Nautilus, 134 S.Ct. at 2128–29). Patents are presumed to be valid, 35 U.S.C. § 282, and indefiniteness must be proved by clear and convincing evidence. Microsoft Corp. v. i4i Ltd. P’ship, ___ U.S. ___, 131 S.Ct. 2238, 2242 (2011). In addition, “[m]eans-plus-function claim limitations under § 112 ¶ 6 must satisfy the definiteness requirement of § 112 ¶ 2.” EON Corp. IP Holdings LLC v. AT & T Mobility LLC, No. 2014-1392, 2015 WL 2083860, at *3 (Fed. Cir. May 6, 2015).

V. Construction of Disputed Claims

The parties dispute the meaning of the following terms⁴ and the Court resolves these disputes as discussed below:

⁴ As previously noted, D. 177, the Court rejects WAC’s attempt to have the Court construe additional terms not previously raised in connection with the original Markman hearing.

A. U.S. Patent No. 6,147,458

No IPR was instituted as to this patent. D. 174 at 8. The '458 patent describes a circuit arrangement for operating a semiconductor light source, as shown in Figure 1 of the '458 patent:

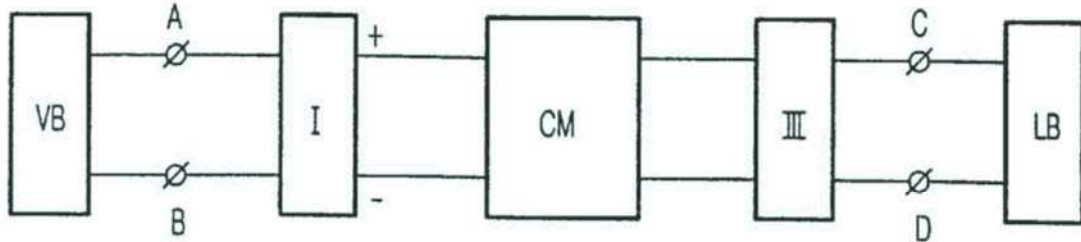


FIG. 1

'458, D. 30-2 at 3. The circuit arrangement includes “connection terminals [A and B] for connecting a control unit [VB], and input filter [I], a converter comprising a control circuit [III], output terminals [C and D] for connecting the semiconductor light source, an apparatus CM for removing a leakage current occurring in the control unit in the non-conducting state, and a self-regulating circuit for deactivating the apparatus CM.” *Id.* at 2.

1. “input filter means” and “filter means”

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
“input filter means” and “filter means”	Not a means-plus function term. “a circuit that selectively transmits or rejects a signal in one or more intervals of frequencies conducted on the line input between the control unit and the converter”	Means-Plus-Function term. Function: Filtering an input. Structure: Indefinite. A structure cannot be determined.

The terms “input filter means,” and “input filter” appear in independent claims 1 and claim 15 of the ‘458 patent. ‘458, D. 30-2 at 7-8. For example, claim 15 provides:

A circuit for operating a semiconductor light source comprising:

input terminals for connection to a control unit,

an input filter coupled to the input terminals,

a converter including a control circuit and having output terminals for connection to the semiconductor light source in order to energize the semiconductor light source,

means CM including a controlled semiconductor element for removing a leakage current occurring in the control unit in the non-conducting state, said means CM having an input coupled to the input filter and an output coupled to the converter,

self-regulating deactivating means for deactivating the means CM when the control unit is in a conductive state, and

detection means for detecting a defective converter or semiconductor light source connected thereto.

‘458, Id. at 8. The PTAB concluded that no construction of these terms was necessary and, therefore, did not construe these terms. D. 118-2 at 8. Although WAC initially argued that the terms are means-plus-function terms and that a person of ordinary skill in the art would understand the claim terms “input filter” and “input filter means” to be indefinite because the specification “never identifies the structure of the input filter means,” D. 40 at 25, its position before the PTAB, where, it contends, a petitioner cannot argue indefiniteness, D. 179 at 11, was that the term should be construed as “an electric circuit or device which selectively transmits or rejects input signals in one or more intervals of frequencies.” D. 174 at 8.

WAC continues now to argue that the term is indefinite since the corresponding structure cannot be determined. D. 179 at 11. The Court does not agree that the term is indefinite,

particularly as to how the Court constructs it below, since it gives reasonable certainty to those skilled in the art about the scope of the invention. Nautilus, 134 S. Ct. at 2129.

WAC's proposed construction before the PTAB is close to the construction that Philips has maintained that both terms (which WAC concedes are synonymous, D. 40 at 25-26; D. 53 (Smith Decl.) at ¶ 61), should be construed as "a circuit that selectively transmits or rejects a signal in one or more intervals of frequencies conducted on the line input between the control unit and the converter." D. 174 at 8. The Court adopts Philips' construction. Such construction recognizes that "input filter" is a standard term of art in the field of power supplies, D. 101-2 at 3 (citing Wiley Electrical and Electronics Engineering Dictionary definition of "filter") and this construction incorporates that definition. Id. Although such definition is extrinsic evidence, it is not contradicted by any intrinsic regarding the patent, specification or prosecution. Phillips, 415 F.3d at 1322-23. Philips' proposed construction also reflects the specification in qualifying the filter to reflect that it is "conducted on the line input between the control unit and the converter" which reflects Figure 1. D. 101-2 at 4. Such construction also is not contradicted by specification, as WAC contends, as the specification only amounts to a "preferable," but not required embodiment. D. 101-2 at 5 (citing '458 patent).

Accordingly, the Court construes the terms "input filter means" and "filter means" to mean "a circuit that selectively transmits or rejects a signal in one or more intervals of frequencies conducted on the line input between the control unit and the converter."

2. “means CM . . .”

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
<p>“means CM for removing a leakage current occurring in the control unit in the nonconductive state”</p> <p>and</p> <p>“means CM for removing a leakage current occurring in the control unit in the non-conducting state, which means include a controlled semiconductor element”</p> <p>and</p> <p>“means CM including a controlled semiconductor element for removing a leakage current occurring in the control unit in the non-conducting state”</p>	<p>Not a means-plus function term.</p> <p>No construction necessary,</p> <p>Or alternatively,</p> <p>“a circuit, including a controlled semiconductor element, that draws leakage current from the control unit when the control unit is off.”</p>	<p>Means-Plus-Function term.</p> <p>Function: Removing a leakage current arising from the control unit, including when the control unit is in a non-conducting state.</p> <p>Structure: the components in the dashed box “CM” – a MOSFET arranged in series with a cutout element FS, the gate g of the MOSFET is connected via a resistor R2 to a voltage divider circuit [which is comprised of a series arrangement of a resistor R1 and a capacitor C1] which is connected electrically in parallel to the input filter means I, the capacitor C1 is shunted by a network comprising a zener diode Z1, a capacitor C10 and a resistor R10, and wherein the source s of MOSFET is connected, by means of a parallel circuit of a resistor R11 and a zener diode Z11 to the negative pole – of the input filter means I.</p>

The term “means CM for removing a leakage current occurring in the control unit in the non-conducting state, which means include a controlled semiconductor element” appears in claim 1 of the ‘458 patent and claim 15 recites “means CM including a controlled semiconductor element for removing a leakage current occurring in the control unit in the non-conducting state.” ‘458, D. 30-2 at 7-8. The parties dispute whether the claim terms are in means-plus-function format. The PTAB did not construe these terms. D. 118-2 at 8.

As discussed above, when a limitation uses the word “means,” it creates a presumption that the limitation invokes § 112(f). Personalized Media Commc’ns, LLC, 161 F.3d at 703. If, however, “a claim element . . . uses the word ‘means’ but recites no function corresponding to the means” or “recites sufficient structure or material for performing that function” then the presumption can be overcome. Allen Eng’g Corp., 299 F.3d at 1347. As such, the “mere use of the word ‘means’ after a limitation, without more, does not suffice to make that limitation a means-plus-function limitation.” Id. (citing Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531 (Fed. Cir. 1996)).

Here, Philips argues that the claims identify sufficient structure to perform the recited function and, therefore, are not in means-plus-function format. D. 35 at 20-21; D. 48 at 15-16. Specifically, the claims identify “a controlled semiconductor element,” which performs the function of “removing a leakage current occurring in the control unit in the non-conducting state.” ‘458, D. 30-2 at 7-8. A preferred embodiment discloses MOSFET 1 as the controlled semiconductor element. Id. at 6 (describing “[t]he means CM, of which the diagram is shown in more detail in FIG. 2, comprise a MOSFET 1 as the controlled semiconductor element . . .”). Indeed, WAC acknowledges that a person of ordinary skill in the art would have understood that the structure recited in the specification to carry out the function of removing a leakage current arising from the control unit “was performed by a MOSFET as the controlled semiconductor element . . .” D. 40 at 27. Thus, since the claim recites structure sufficient to perform the recited of “removing a leakage current occurring in the control unit in the non-conducting state” (i.e., “a controlled semiconductor element”), the term is not a means-plus-function limitation.

To the extent that construction is necessary, Philip’s proposed construction and WAC’s position before the PTAB are the same: “a circuit, including a controlled semiconductor element,

that draws leakage current from the control unit when the control unit is off.” D. 174 at 8-9. Accordingly, the Court concludes that the “means CM” terms mean “a circuit, including a controlled semiconductor element, that draws leakage current from the control unit when the control unit is off.”

3. *“removing a leakage current”*

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
“removing a leakage current”	No construction necessary, or alternatively, “drawing current that flows through a device in the off state.”	Compromise Construction: “drawing leakage current that flows through a device in the off state and causes unnecessary power dissipation”

Claims 1 and 15 recite “removing a leakage current.” ‘458, D. 30-2 at 7-8. The PTAB concluded that no construction of this term was necessary. D. 118-2 at 8.

Here, Philips points the Court to the specification, which explains that a light may be controlled by a control unit (a solid-state relay), that conducts or “leaks” a small amount of current when the control unit is off, or in a “non-conducting state,” and the means CM is intended to draw or “remove” this current. ‘458, D. 30-2 at 5; see D. 101-2 at 14. As shown in Figure 2 of the specification, MOSFET 1 is turned on when the control unit is in a non-conductive state, and the means CM drains the leakage from the control unit through MOSFET 1 to the ground. ‘458, id. at 4, 6. Furthermore, Philips notes that an expert engaged by WAC’s counsel in prior litigation agreed that Philips’ proposed construction “is correct.” D. 48 at 17; see Smith Dep., D. 36-12 at 73. Accordingly, for these reasons, the Court adopts Philips’ construction and concludes that the term ““removing a leakage current” means “drawing current that flows through a device in the off state.”

4. “self-regulating deactivating means . . .”

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
<p>“self-regulating deactivating means for deactivating the means CM”</p> <p>and</p> <p>“self-regulating deactivating means for deactivating the means CM when the control unit is in a conductive state”</p>	<p>Means-Plus-Function term.</p> <p>Function: “deactivating the means CM.”</p> <p>Structure: “transistor TM and zener diode Z60.”</p>	<p>Means-Plus-Function term.</p> <p>Function: Not disputed</p> <p>Structure: the circuit arrangement of Figure 2, Block IV, including Sub-component Blocks VI and VII.</p> <p>Block “VI” has a zener diode Z60 arranged in series with a voltage-dividing network;</p> <p>Block “VII” has a zener diode Z70 connected to a control electrode and to an emitter of a switch TH, a collector of the switch TH is connected to the control electrode of switch TM, when the switch TH is rendered conductive, it generates a control signal SH for eliminating the control signal SL; the zener diode Z70 is also connected to the control circuit of the converter III by a resistance-diode network via a connection point G.</p>

Claim 1 recites “self-regulating deactivating means for deactivating the means CM” and claim 15 recites “self-regulating deactivating means for deactivating the means CM when the control unit is in a conductive state.” ‘458, D. 30-2 at 7-8. The PTAB did not reach construction of these terms. D. 118-2 at 8.

The parties agree that these terms are mean-plus-function terms and that the function is “deactivating the means CM.” D. 35 at 22; D. 40 at 28-29. The specification describes deactivating means IV in Figure 2, reproduced below, as performing this function. ‘458, D. 30-2 at 6 (explaining that “FIG. 2 also shows deactivating means IV . . . which serve to deactivate the means CM”).

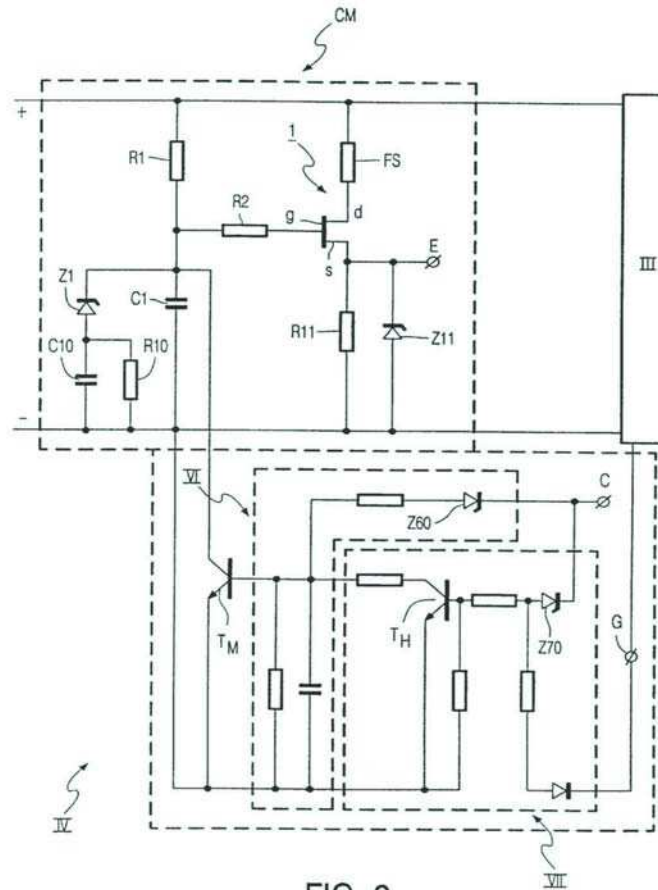


FIG. 2

Id. Philips offers expert testimony that “the components necessary to perform the recited functions are transistor TM and zener diode Z60.” D. 37 (Batarseh Decl.) at ¶ 55 (explaining that “[t]o deactivate the means CM, transistor TM turns on or becomes conducting when zener diode Z60 is conducting, which brings the voltage on the gate of MOSFET 1 below its operational threshold” which causes MOSFET 1 to turn off). WAC’s proposal is consistent with Philips’ construction to

the extent that it includes “transistor TM and zener diode Z60,” but WAC identifies corresponding structure that is outside of the “dashed box IV,” e.g., “resistor R1” and “capacitor C1.”

Philips argues that WAC’s proposed structure errs by identifying structure outside the dashed box IV and several components inside the dashed box IV, other than transistor TM and zener diode Z60, that are not necessary for performing the recited function. D. 35 at 23-24; D. 37 (Batarseh Decl.) at ¶ 57. For example, Philips’ expert explains that the resistor R1 and capacitor C1 form an RC filter bias MOSFET 1, the parallel resistor and capacitor in box VI (located inside of box IV) serve to prevent the transistor TM from inadvertently turning on or off and the resistor in series with zener diode Z60 limits current to avoid damage to transistor TM. D. 37 ¶ 57. Because the Court credits the showing that these components are not necessary to deactivate the means CM, the Court concludes that the corresponding structure necessary to perform the recited function are the “transistor TM and zener diode Z60.” See Asyst Techs., Inc., 268 F.3d at 1371 (noting that “[i]t is well established that it is not necessary to claim in a patent every device required to enable the invention to be used” and explaining that although “[a]n electrical outlet enables a toaster to work, [] the outlet is not for that reason considered part of the toaster” (citation omitted)).⁵ Accordingly, the Court concludes that for the “self-regulating deactivating means for deactivating the means CM” and “self-regulating deactivating means for deactivating the means CM when the control unit is in a conductive state,” the undisputed construction of the function is “deactivating the means CM” and the structure is “transistor TM and zener diode Z60.”

⁵The parties no longer dispute the construction of “detection means for detecting an incorrect functioning of the converter or of the semiconductor light source connected thereto” and “detection means for detecting a defective converter or semiconductor light source connected thereto” in Claims 1 and 15 of the ‘458 patent. D. 175 at 7.

B. U.S. Patent No. 6,561,690

The '690 patent discloses a lighting system (a “luminaire”) having a housing that defines an internal space containing at least one LED and an optic means (a “collimator”) for guiding the light emitted by the LED towards outside of the housing. ‘690, D. 30-4 at 2.

1. “optical means for guiding the light emitted by the LED towards outside of the housing”

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
<p>“optical means for guiding the light emitted by the LED towards outside of the housing”</p>	<p>Means-Plus-Function term.</p> <p>Function: “guiding the light emitted by the LED towards outside of the housing”</p> <p>Structure: “collimator with a symmetrical lateral surface”</p>	<p>Means-Plus-Function term.</p> <p>Function: No longer disputed</p> <p>Structure: Collimator 4 (Fig. 1) and 23 (Figs. 2-3), i.e.:</p> <p>A full-body collimator formed by a solid mass of a material which transmits light and is temperature-resistant, wherein the collimator has a symmetrical lateral surface based on a parabolic or conical body of revolution, a planar front surface, and a base surface geometrically opposed to the front surface; the base is planar; the emission characteristic of the system comprising the LED and the collimator has a maximum emission direction which is perpendicular to the plane defined by the front surface of the collimator and has a cavity in its base for accommodating the LED; the inside of the cavity is over-dimensioned and the collimator rests with its base on the support on which the LED is mounted. (Alternatively, the collimator could be formed by a conical concave reflector).</p>

The term “optical means for guiding the light emitted by the LED towards outside of the housing” appears in claim 1 of the ’690 patent. ’690, D. 30-4 at 8-9. Philips and WAC agree that “optical means for guiding the light emitted by the LED towards outside of the housing” is in means-plus-function term and that the function is “guiding the light emitted by the LED towards outside of the housing.” D. 35 at 28; D. 174 at 12. The PTAB adopted this construction. D. 118-4 at 8.

As to the structure, the PTAB adopted WAC’s construction of the structure as a “collimator.” D. 118-4 at 10. Philips contends that a person of ordinary skill in the art at the time of the invention would understand that the corresponding structure disclosed in the specification is “a collimator with a symmetrical lateral surface,” see, e.g., D. 38 (Teich Decl.) ¶ 24. Moreover, Philips argues that WAC identifies exemplary embodiments that are not necessary for “guiding the light.” Id. ¶¶ 28-29. For example, Philips notes that “a collimator with a symmetrical lateral surface can guide the light emitted by the LED, irrespective of whether it is temperature resistant, its base is planar, or it rests with its base on the support.” Id. at ¶ 29.

The specification describes several exemplary collimators as the optical means, each having in common a symmetrical lateral surface, which is the only structure necessary to perform the function of “guiding the light emitted by the LED towards outside of the housing.” See, e.g., ’690, D. 30-4 at 3-5 (Fig. 1 (collimator 4), Fig. 2 (collimator 23), Fig. 3 (collimator 23)); id. at 7 (noting that “[t]he optical means here comprise a collimator 4 formed by a solid mass of a material which transmits light and is temperature-resistant . . . [t]he optical means are formed by a ‘full-body’ collimator 4 here, but they may alternatively be formed by, for example, a conical concave reflector. The collimator 4 has a symmetrical lateral surface 5 based on a parabolic or conical body

of revolution). However, the Court finds persuasive the PTAB’s reasoning⁶ that the patent does not require a narrower construction requiring “any particular collimator shape” where the patent does not discuss the relative virtues of any shape and there is “no evidence that a different shape could not perform the agreed-upon function.” D. 118-4 at 9. The Court, therefore, agrees with WAC that the corresponding structure necessary to perform the recited function is a “collimator.”

Accordingly, the Court construes the term “optical means for guiding the light emitted by the LED towards outside of the housing” as a function of “guiding the light emitted by the LED towards outside of the housing” and the structure as a “collimator.”

C. U.S. Patent No. 6,586,890

As to each of the five disputed terms in the ‘890 Patent, the parties agree that they are all means-plus-function terms. D. 178 at 8. With the exception of one term noted below (“means of supplying . . .,” D. 118-5 at 8-9), the PTAB did not construe these terms. See D. 179 at 11. WAC disputes Philips’ proposed function for the first term “means for sensing,” but agrees that the function for the other four terms are the recited functions. Id. at 8-9; D. 179-2 at 6-9. The parties still dispute the corresponding structure for each of the five terms. The Court addresses these disputes below.

⁶ Clearlamp, LLC v. LKQ Corp., No. 12-cv-2533, 2016 WL 4734389, at *5 n.7 (N.D. Ill. Mar. 18, 2016) (collecting cases where district courts considered a PTAB *inter partes* review rulings as persuasive authority).

1. “means for sensing current to the LED array, said current sensing means generating a sensed current signal”

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
“means for sensing current to the LED array, said current sensing means generating a sensed current signal”	<p>Means-Plus-Function term.</p> <p>Function: “sensing current to the LED array and generating a sensed current signal.”</p> <p>Structure: “current sensor 60; resistor R1A1, R1A2, and/or R1A3 in Figure 2A; or resistor R1B1, R1B2, and/or R1B3 in Figure 2C.”</p>	<p>Means-Plus-Function term.</p> <p>Function: “originating an electric signal that corresponds to the level of sensed electrical current”</p> <p>Structure: Indefinite. A structure cannot be determined.</p>

The parties at least initially agreed that the function was, Philips still proposes, “sensing current to the LED array and generating a sensed current signal.” D. 35 at 25-26. The Court does not agree with WAC that its alternative construction is required as the function would be understood as requiring an electrical signal that corresponds to the level of sensed electrical current. D. 52 at 19; D. 53 (Smith Aff.) at ¶¶ 97. The Court, therefore, adopts Philips’ construction of the function, particularly where WAC’s proposed construction does not appear supported by the language in the claim. D. 48 at 20. As to the structure, the Court does not agree with WAC that it is indefinite. D. 52 at 19. The Court concludes that the structure can be constructed from the claim, D. 37 (Batarseh Decl.) at ¶¶ 71-72, and, therefore, is not indefinite. Moreover, Philips’ construction comports with the language in the claim. Accordingly, the Court adopts Philips’ construction of the structure.

2. “means for generating a reference signal”

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
“means for generating a reference signal”	<p>Means-Plus-Function term.</p> <p>Function: “generating a reference signal.”</p> <p>Structure: “reference current source 62; or the internal reference in PWM control IC 118 or 134.”</p>	<p>Means-Plus-Function term.</p> <p>Function: Not disputed</p> <p>Structure: Indefinite. A structure cannot be determined.</p>

As to the parties’ dispute about the structure, the Court does not agree with WAC that it is indefinite. The Court does not agree with its’ contention that the specification is incomplete as to describing the structure. D. 52 at 19. To the contrary, the specification notes that the reference current source 62 or internal reference in the PWM control IC 134 performs the function. D. 35 at 26-27. That is, the structure can be construed. D. 37 (Batarseh Decl.) at ¶¶ 74-75. Accordingly, the Court adopts Philips’ construction of the structure.

3. “means for comparing” and “means for comparing the sensed current signal to the reference current signal” and “means for comparing the sensed current signal to the reference signal, said comparing means generating a feedback signal”

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
<p>“means for comparing”</p> <p>and</p> <p>“means for comparing the sensed current signal to the reference current signal”</p> <p>and</p>	<p>Means-Plus-Function term.</p> <p>Function: “comparing the sensed current signal to the reference signal and generating a feedback signal.”</p> <p>Structure: “comparator 58; or the internal op-amp in PWM control IC 118 or 134.”</p>	<p>Means-Plus-Function term.</p> <p>Function: Not disputed</p> <p>Structure: A proportional type op-amp control circuit which generates a current error.</p>

“means for comparing the sensed current signal to the reference signal, said comparing means generating a feedback signal”		
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As to this term, the parties have competing constructions of the structure. Both include “op-amp” as part of the structure, D. 35 at 27-28; D. 40 at 26-17, but WAC’s construction does not sufficiently explain why “generates a current error” is required to perform the function. Compare D. 52 at 19 with D. 48 at 14-15. Accordingly, the Court adopts Philips’ construction of the structure.

4. *“means for modulating pulse width responsive to the feedback signal, said pulse width modulating means generating a drive signal”*

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
“means for modulating pulse width responsive to the feedback signal, said pulse width modulating means generating a drive signal”	<p>Means-Plus-Function term.</p> <p>Function: “modulating a pulse width responsive to the feedback signal and generating a drive signal.”</p> <p>Structure: “pulse width modulation (PWM) control IC 56; PWM control IC 118; or PWM control IC 134.”</p>	<p>Means-Plus-Function term.</p> <p>Function: Not disputed</p> <p>Structure: An integrated controller that produces a high frequency periodic drive signal of varying pulse width having a square wave oscillating between 0 and 12 volts with a frequency of 20 kHz, 0 and 16 volts with a frequency of 200 to 300 Hertz, or between 0 and 600 mA with a frequency of 200 to 300 Hz.</p>

The parties also have competing constructions of this structure. As to WAC’s construction, the Court agrees with Philips that WAC’s construction imports additional limitations from an embodiment in the specification. D. 35 at 29. That is, the recited function does not require, for

example, “having a square wave oscillating between 0 and 12 volts . . .,” but are merely exemplary operating modes. Accordingly, the Court adopts Philips’ construction of the structure as “pulse width modulation (PWM) control IC 56; PWM control IC 118; or PWM control IC 134.”

5. *“means for supplying power responsive to the drive signal, said power supplying means supplying current to the LED array”*

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
“means for supplying power responsive to the drive signal, said power supplying means supplying current to the LED array”	<p>Means-Plus-Function term.</p> <p>Function: “supplying power responsive to the drive signal and supplying current to the LED array.”</p> <p>Structure: “a buckboost, boost, buck, or flyback power supply.”</p>	<p>Means-Plus-Function term.</p> <p>Function: Not disputed</p> <p>Structure: A buckboost, boost, buck, or flyback power supply; with a transistor Q1A, inductor L1A, and diode D4A; or transistor Q1B, inductor L1B, and diode D4B.</p>

As the parties agree, the PTAB agreed that this term is in the means plus function format. D. 118-5 at 8. The parties agree that the function is “supplying power responsive to the drive signal and supplying current to the LED array.” The PTAB did not adopt either party’s construction as to the structure, and instead construed it as “a buckboost, boost, buck, or flyback power supply and its equivalent power supplies that regulate current (as opposed to regulating voltage).” *Id.* The Court agrees that this construction is more consistent with the specification’s disclosure of the structure and the claim language and thereby adopts this construction as well.

D. U.S. Patent No. 6,788,011

The ’011 concerns color mixing of LED lights. *See* ‘011, D. 30-6 at 12. The patent notes that “[i]t is well known that combining the projected light of one color with the projected light of another color will result in the creation of a third color,” and that “the three most commonly used

primary colors—red, blue and green—can be combined in different proportions to generate almost any color in the visible spectrum.” Id. The ’011 patent “takes advantage of these effects by combining the projected light from at least two light emitting diodes (LEDs) of different primary colors.” Id. There were no IPR proceeding as to this patent. D. 174 at 18.

1. “second LED”

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
“second LED”	No construction necessary, or alternatively, “a second light emitting diode.”	A light emitting diode separate and distinct from the first LED.

The term “second LED” appears in claims 93, 122, 127, and 130 of the ’011 patent.

’011, D. 30-6 at 20-23. For example, claim 130 provides:

An illumination apparatus, comprising:

at least one first LED adapted to output at least first radiation having a first spectrum;

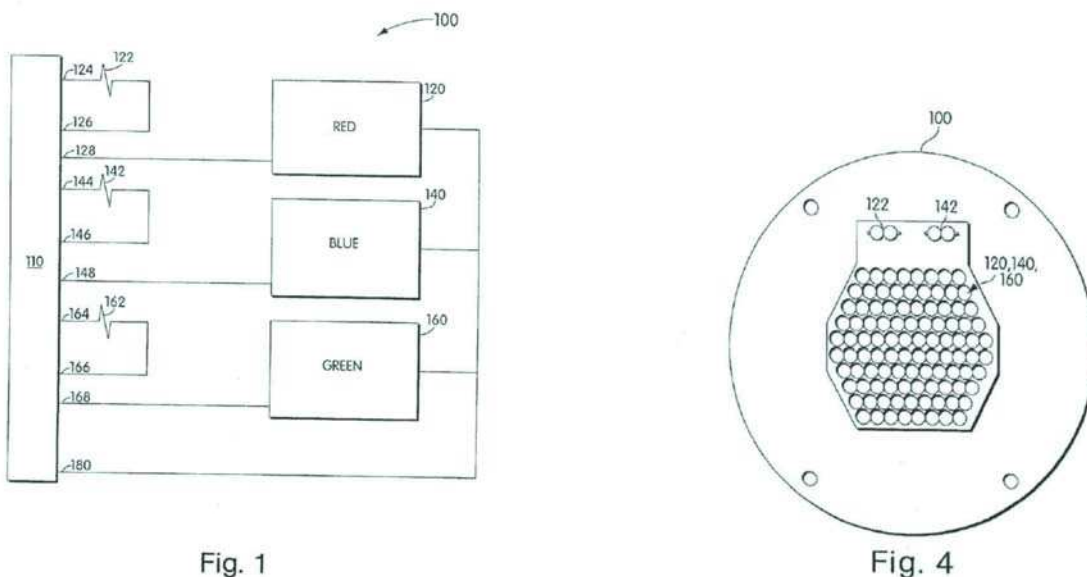
at least one second LED adapted to output second radiation having a second spectrum different than the first spectrum; and

at least one controller coupled to the at least one first LED and the at least one second LED and configured to respond to at least one signal formatted at least in part using a DMX protocol, the at least one signal including lighting information based at least in part on user operation of at least one user interface in communication with the at least one controller, the at least one controller further configured to independently control at least a first intensity of the first radiation and a second intensity of the second radiation in response to the lighting information.

Id. at 23.

The parties agree that “first LED” should be construed to mean “a first light emitting diode.” D. 35 at 35; D. 40 at 36. Similarly, here, Philips’ proposed construction is “a second light

emitting diode.” D. 35 at 35. Philips argues that the “separate and distinct” language proposed by WAC should be rejected because it could be interpreted as narrowing the scope of the claims to exclude embodiments where the first and second LEDs are physically or electrically connected, inconsistent with the ’011 patent. D. 35 at 36. In other words, Philips argues that “second LED” should include “separate and distinct” LEDs as well as LEDs that are physically and electronically connected. Id. at 37. In support, Philips points the Court to Figure 1 and Figure 4 of the ’011 patent, shown below:



Id. at 36; see ’011, D. 30-6 at 5, 9. Figure 1 discloses three LEDs of different colors (120, 140, and 160) that are electrically connected to one another, and Figure 4 shows LEDs of different colors (120, 140 and 160) physically grouped together. ’011, D. 30-6 at 5, 9. Philips argues that WAC’s proposed construction could improperly exclude these embodiments. D. 35 at 37 (citing MBO Labs., Inc. v. Becton, Dickinson & Co., 474 F.3d 1323, 1333 (Fed. Cir. 2007) (rejecting limitations on claims that excluded embodiments disclosed in the specification)). WAC contends that its construction “does not read out LEDs that may be connected to one another” and that the figures shown above depict LEDs that are separate and distinct from each other. D. 52 at 21. To

that end, Philips notes that it “could agree with [WAC’s] construction,” but argues that WAC is attempting to exclude “second LEDs” that are in the same package as the first LED. Tr. 2:11-12. The parties’ dispute, therefore, centers on whether subcomponents of the LED package could meet the “second LED” limitation.

WAC argues that the “second LED” must be “separate and distinct” because claims 122 and 130 require that the intensity associated with each LED be independently controlled, which WAC argues cannot be accomplished on the subcomponent level. As Philips points out, however, Figure 1 depicts a number of electrical current lines (128, 148 and 168), which are independently controlled the LEDs. Tr. 2:26. Accordingly, the Court will not reinterpret the claim language where it is sufficiently clear and where the specification discloses embodiments electronically and physically grouped together. For the reasons stated above, the Court concludes that no construction is necessary for the term “second LED.”

E. U.S. Patent No. 7,038,399 and 7,352,138

The ’399 patent and the related ’138 patent describe electronic circuitry for powering LEDs through conventional alternating current dimmer switches. D. 35 at 43. The ’399 and ’138 patents disclose methods and apparatus able to control the intensity of LEDs when supplied with the types of signals that come from conventional dimmer switches. *Id.* at 44.

1. signals other than a standard A.C. line voltage

Term	Philips’ Proposed Construction	WAC’s Proposed Construction
“signals other than a standard A.C. line voltage”	No construction necessary, or alternatively, “signals other than a single sinusoidal wave at a fixed	Indefinite. A construction is not possible or, alternatively, “[A.C. power source that provides] more than 1 signal but does not provide a standard A.C. line voltage”

	frequency and a fixed amplitude”	
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The term “signals other than a standard A.C. line voltage” appears in claims 7, 17, and 34 of the ‘399 patent and claim 1 of the ‘138 patent. ‘399, D. 30-7 at 28-29; ‘138, D. 30-8 at 27-28.

For example, claim 7 of the ‘399 patent provides, in part:

An illumination apparatus comprising:

at least one LED; and

at least one controller coupled to the at least one LED and configured to receive a power-related signal from an alternating current (A.C.) power source that provides signals other than a standard A.C. line voltage, the at least one controller further configured to provide power to the at least one LED based on the power-related signal

‘399, D. 30-7 at 28.

Although WAC concedes that the specification expressly uses the term “signals other than a standard A.C. line voltage,” it argues that in both instances it is used in a “conclusory statement absent of any explanation, description or examples” and that the term is, therefore, “incapable of construction.” D. 40 at 40. Id. WAC further argues that since the ‘138 Patent is a continuation of the ‘399 patent, the term should be construed identically across the patents as indefinite. Id.

“[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” Nautilus, 134 S. Ct. at 2124. “The definiteness requirement, so understood, mandates clarity, while recognizing that absolute precision is unattainable.” Id. at 2129. Philips argues that the specification discloses a standard A.C. line voltage as a single sinusoidal wave at a fixed frequency and a fixed amplitude. D. 35 at 44; D. 48 at 27. Indeed, the specification identifies two common standard A.C. line voltages, including “120 Volts RMS at 60 Hz” (common in the United States) and “220 Volts RMS at 50 Hz” (common in

Europe). ‘399, D. 30-7 at 16; see D. 37 (Batarseh Decl.) at ¶ 95 (explaining that “[t]hese standard A.C. line voltages are transmitted in the form of a single sinusoidal wave and at a fixed frequency . . . [t]herefore, a person of ordinary skill in the art at the time of the invention would have understood that ‘signals other than a standard A.C. line voltage’ referred to signals other than ‘a single sinusoidal wave at a fixed frequency’”). The term “signals other than a standard A.C. line voltage,” then, encompasses signals that are not “a standard A.C. line voltage.” Although this construction is broad, the Court will not find it to be indefinite.

Although WAC still appears to press the indefiniteness argument, D. 179-2 at 10; D. 179 at 7 n. 7, it alternatively argues (in light of the PTAB’s construction of this term), that this term, if not indefinite, should be construed as “[A.C. power source that provides] more than one signal but does not provide a standard A.C. line voltage.” D. 179-2 at 10.

The PTAB concluded that this term did not need construction and that the “other than a standard A.C. line voltage” is not limited to A.C. signals. D. 118-6 at 11; D. 118-7 at 11-12. The Court finds this analysis persuasive and, accordingly, adopts the same position.

VI. Conclusion

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

1. the terms “input filter means” and “filter means” mean “a circuit that selectively transmits or rejects a signal in one or more intervals of frequencies conducted on the line input between the control unit and the converter”;
2. the term “means CM” means “a circuit, including a controlled semiconductor element, that draws leakage current from the control unit when the control unit is off”;
3. the term “removing a leakage current” means “drawing current that flows through a device in the off state”;

4. the terms “self-regulating deactivating means for deactivating the means CM” and “self-regulating deactivating means for deactivating the means CM when the control unit is in a conductive state,” mean “deactivating the means CM” for function and the structure is “transistor TM and zener diode Z60”;
5. the term “optical means for guiding the light emitted by the LED towards outside of the housing” means the function of “guiding the light emitted by the LED towards outside of the housing” and the structure as a “collimator”;
6. the term “means for sensing. . .” means for function, “sensing current to the LED array and generating a sensed current signal” and for structure, means “current sensor 60; resistor RiA1, R1A2 and/or R1A3 in Figure 2A; or resistor R1B1, R1B2, and/or R1B3 in Figure 2C”;
7. the term “means for generating . . .” means for function, “generating a reference signal,” and for structure, means “reference current source 62; or the internal reference in PWM control IC 118 or 134”;
8. the term “means for comparing . . .” means for function, “comparing the sensed current signal to the reference signal and generating a feedback signal,” and for structure, means “comparator 58; or the internal op-amp in PWM control IC 118 or 134”;
9. the term “means for modulating . . .” means, as to function, “modulating a pulse width responsive to the feedback signal and generating a drive signal” and for structure, means “pulse width modulation (PWM) control IC 56; PWM control IC 118; or PWM control IC 134”;
10. the term “means for supplying . . .” means, as to function, “supplying power responsive to the drive signal and supplying current to the LED array” and, as to structure, means “a buckboost, boost, buck or flyback power supply and its equivalent power supplies that regulate current (as opposed to regulating voltage)”;
11. No construction is necessary for the term “second LED”; and
12. No construction is necessary for the term “signals other than a standard A.C. line voltage.”

So Ordered.

/s/ Denise J. Casper
United States District Judge