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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EiKO Global, LLC and
Halco Lighting Technologies, LLC
Petitioners

v.

Patent Owner of
U.S. Patent No. 7,086,747 to Lyman O. Nielson and Norman B. Hess

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Inter Partes Review Case No. Unassigned

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 7,086,747 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.1-.80, 42.100-.123

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I. MANDATORY NOTICES AND FEES

A. Real Parties-in-Interest

EiKO Global, LLC and Halco Lighting Technologies, LLC are the real parties-in-interest.

B. Related Matters

The following matters may affect or be affected by a decision herein: *Blackbird Tech, LLC v. EiKO Global, LLC*, Case No. 1:16-cv-00967-RGA (DED); *Blackbird Tech, LLC v. Halco Lighting Technologies, LLC*, Case No. 1:16-cv-00971-RGA (DED).

C. Counsel

Lead counsel in this case is David Radulescu, Ph.D. (PTO Reg. No. 36,250); backup counsel is Angela Chao (PTO Reg. No. 71,991). Powers of attorney accompany this Petition.

D. Service Information

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E. Payment

Under 37 C.F.R. § 42.103(a), the Office is authorized to charge the fee set forth in 37 C.F.R. § 42.15(a) to Deposit Account No. 506352 as well as any additional fees that might be due in connection with this Petition.

II. CERTIFICATION OF GROUNDS FOR STANDING

The Petitioners certify pursuant to 37 C.F.R. § 42.104(a) that the patent for which review is sought is available for *inter partes* review and that the Petitioners are not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

III. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

Pursuant to Rules 42.22(a)(1) and 42.104(b)(1)-(2), the Petitioners challenge claims 1 and 12 of U.S. Patent No. 7,086,747 (the "'747 patent") (Ex. 1001).

A. Prior Art Patents

The Petitioners rely upon the patents listed in the Table of Exhibits, including:

1. U.S. Patent No. 5,410,453 to Ruskouski, ("Ruskouski" (Ex. 1004)), which is prior art under at least § 102(b).
2. U.S. Patent No. 4,323,820 to Teich, ("Teich" (Ex. 1005)), which is prior art under at least § 102(b).

3. U.S. Patent No. 7,204,602 to Archer, ("Archer" (Ex. 1006)), which is prior art under at least § 102(e).

4. U.S. Patent No. 6,283,612 to Hunter, ("Hunter" (Ex. 1007)), which is prior art under at least § 102(b).

5. U.S. Patent No. 5,226,724 to Kanarek. ("Kanarek" (Ex. 1008)), which is prior art under at least § 102(b).

6. U.S. Patent No. 7,049,761 to Timmermans, *et al*., ("Timmermans" (Ex. 1009)), which is prior art under at least § 102(b).

7. U.S. Patent No. 6,184,628 to Ruthenberg, ("Ruthenberg" (Ex. 1013)), which is prior art under at least § 102(b).

B. Grounds for Challenge

The Petitioners request cancellation of claims 1 and 12 of the '747 patent ("challenged claims") as unpatentable under 35 U.S.C. §§ 102, 103. This Petition, supported by the declaration of Eric Bretschneider ("Bretschneider Decl." (Ex. 1003)), filed herewith, demonstrates that there is a reasonable likelihood that the Petitioners will prevail with respect to at least one challenged claim and that each challenged claim is not patentable. *See* 35 U.S.C. § 314(a).

Ground 1: Claims 1 and 12 are obvious over Ruskouski in view of Teich.

Ground 2: Claims 1 and 12 are anticipated by Archer.

Ground 3: Claim 12 is obvious over Archer in view of Ruthenberg.

Ground 4: Claim 12 is obvious over Hunter in view of Kanarek and Timmermans.

IV. OVERVIEW OF THE '747 PATENT

A. Background

The '747 patent is directed to an energy-efficient lighting apparatus. '747 patent at Abstract (Ex. 1001). The lighting apparatus is energy efficient because it makes use of light-emitting diodes, or LEDs. '747 patent at 4:60-67 (Ex. 1001). The invention purports to relate to lighting apparatus that provide sufficient illumination to satisfy after-hours lighting requirements, emergency lighting requirements, and low light requirements. '747 patent at 1:17-22 (Ex. 1001). This may be accomplished by using LEDs for after-hours lighting in conjunction with fixtures for fluorescent lighting that are used during normal business hours. '747 patent at 4:51-56 (Ex. 1001). The LEDs may also be turned on to provide low level lighting at other times. '747 patent at 4:58-59 (Ex. 1001).

B. Summary of Alleged Invention of the '747 Patent

Claims 1 and 12 of the '747 patent are directed at a lighting apparatus and a retrofit of a lighting apparatus, respectively, that include LEDs. '747 patent at cls. 1, 12 (Ex. 1001). The '747 patent discloses another embodiment that relates to other claims, such as claims 30 and 31 that are not the subject of this Petition. '747 patent at cls. 30, 31 (Ex. 1001).

Claims 1 and 12 describe very similar and straightforward subject matter. Each claim describes the use of a circuit-board comprising a plurality of light-emitting diodes. '747 patent at cls. 1, 12 (Ex. 1001).

Claim 1 is directed toward an embodiment that incorporates a ballast cover, while claim 12 is directed toward an embodiment that describes a housing for retrofit with a light fixture having a ballast cover. '747 patent at cls. 1, 12 (Ex. 1001).

Figure 1 is an example of the embodiment incorporating a ballast cover 110, as shown in the annotated figure below. '747 patent at Fig. 1 (110), 4:35-39 (Ex. 1001). In the claim 1 embodiment, the ballast cover has holes in it and the circuit board is placed adjacent to the ballast cover so that the LEDs protrude through these holes, as depicted in the annotated figure below. '747 patent at Fig. 1 (104), 4:41-44 (Ex. 1001).

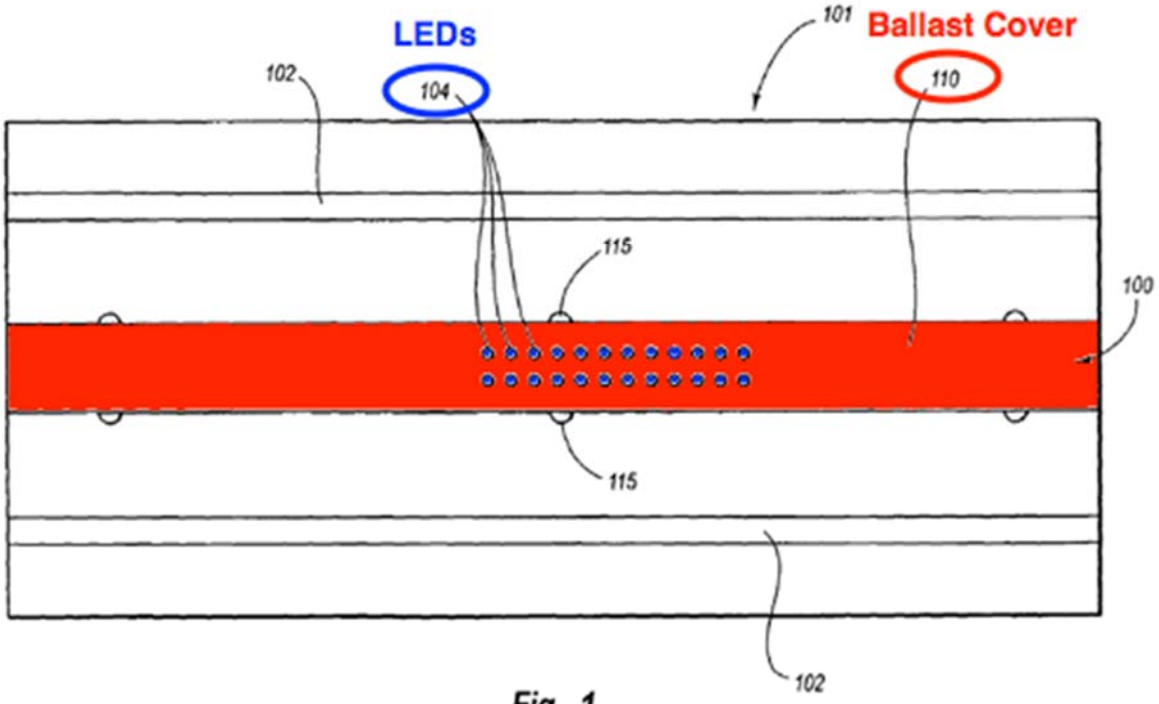

Fig. 1

Figure 5 is an example of the embodiment of claim 12 employing a housing 528 for retrofit with a light fixture having a ballast cover, as shown in the annotated figure below. '747 patent at Fig. 5 (528), 9:1-11 (Ex. 1001). In the claim 12 embodiment, the housing has two surfaces, specifically an attachment surface 530 and an illumination surface 532, as shown in the annotated figure below. '747 patent at Fig. 5 (530, 532), 9:26-35 (Ex. 1001). The illumination surface is described as being opposite the attachment surface. '747 patent at Fig. 5 (530, 532), 9:19-20 (Ex. 1001). In this embodiment, the illumination surface of the housing (rather than the ballast cover) has holes in it, and LEDs, which are attached to

circuit board 511, protrude through these illumination surface holes, as shown in the annotated figures 5 below. '747 patent at Fig. 5 (511, 504), 9:26-35 (Ex. 1001).

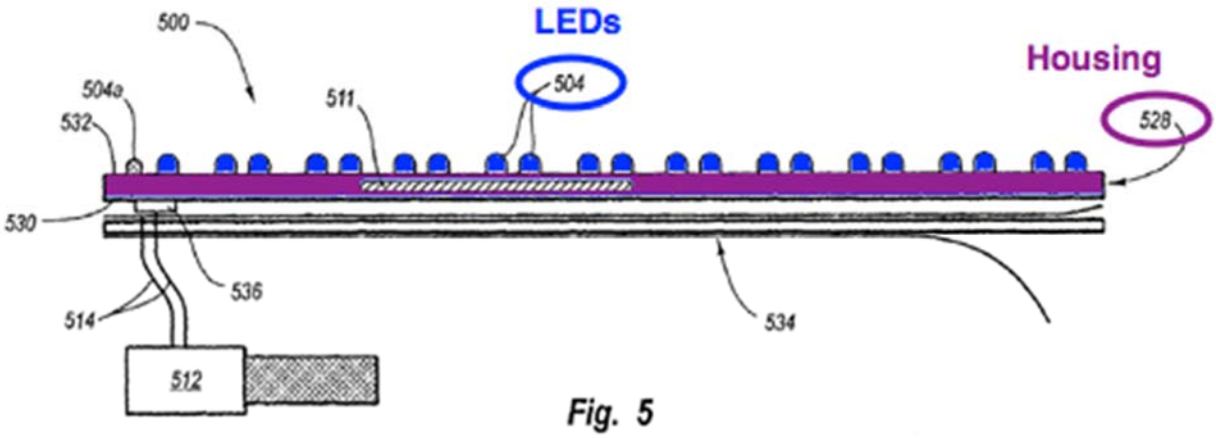

Fig. 5

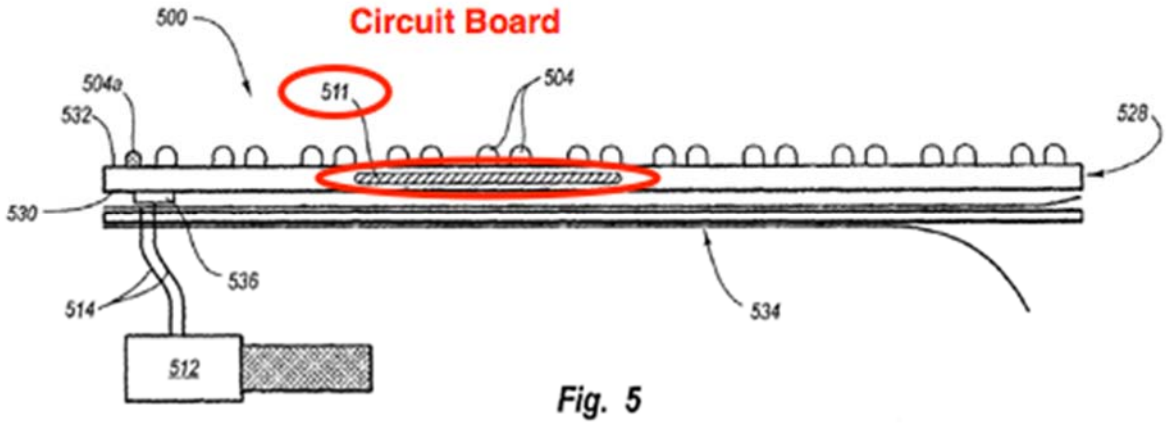

Fig. 5

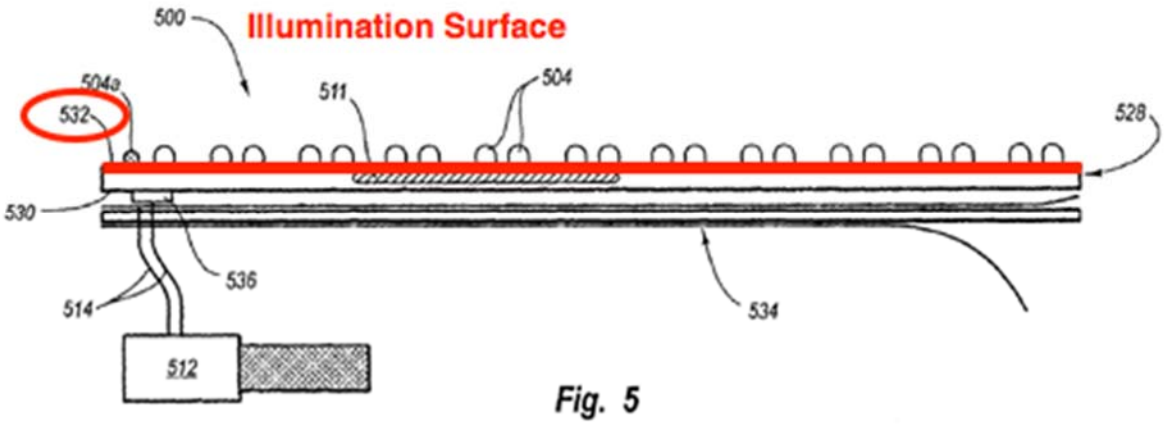

Fig. 5

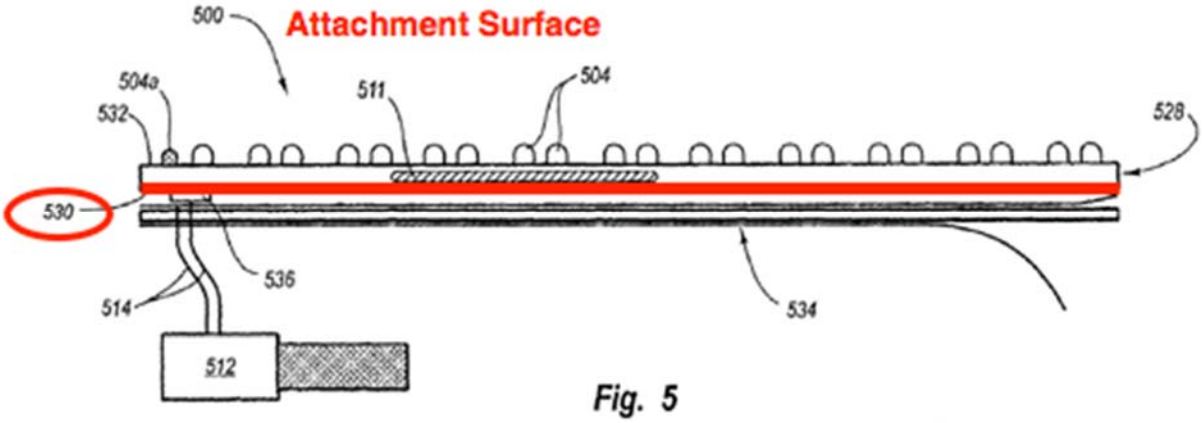

Fig. 5

In the specification, the attachment surface of the housing is described as being secured to a ballast cover in the claim 12 embodiment, however claim 12 itself does not recite any such requirement. '747 patent at 9:17-19, 9:20-25 (Ex. 1001). Additionally, claim 12 requires that the illumination surface and the attachment surface be secured together by way of a "fastening mechanism." '747 patent at cl. 12 (Ex. 1001).

Finally, both claims 1 and 12 require that the described lighting apparatus be coupled to a wall switch and that the wall switch operate by controlling the illumination of the LEDs based on the position of the wall switch. '747 patent at cls. 1, 12, 6:23-31 (Ex. 1001).

C. Prosecution History

The '747 patent claims priority from U.S. Patent Application Serial No. 60/432,562, filed on December 11, 2002. The application that led to the '747 patent, U.S. Patent Application Serial No. 10/733,853, was filed on December 11, 2003 with 32 claims. On April 27, 2005, the Examiner issued an Office Action rejecting all 32 claims. According to the Examiner, claims 1-5, 8-9, 12-16 and 19-20 were rejected as being anticipated by Ruskouski. April 27, 2005 Office Action at 2-4 (Ex. 1002). According to the Examiner, the remainder of the claims were obvious as unpatentable over Ruskouski in combination with other references not relevant to or referenced in this Petition. April 27, 2005 Office Action at 6-13 (Ex. 1002).

In an Amendment and Response to Office Action dated October 6, 2005, the Applicant did not dispute the Examiner's statement that the claims were anticipated by Ruskouski, or obvious over combinations of Ruskouski and other prior art references. October 6, 2005 Amendment and Response at 8 (Ex. 1002). Instead, the Applicant amended claims 1, 12, 25 and 29 (all of the independent claims) by adding the limitation "wherein the lighting apparatus is coupled to a wall switch and

wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch." October 6, 2005 Amendment and Response at 2, 4, 6, 7, 8 (Ex. 1002). The Applicant's stated reasoning for this amendment was that Ruskouski does not teach that the illumination of LEDs within the Ruskouski exit signs are controllable based upon the position of a wall switch. October 6, 2005 Amendment and Response at 8 (Ex. 1002). The Applicant goes on to say that Ruskouski, and other exit signs in the art, will be constantly illuminated, and thus will not be controlled by such a wall switch. *Id*. The Applicant made no other remarks or amendments regarding independent claims 1 and 12, and made similar remarks regarding other claims. October 6, 2005 Amendment and Response at 8-14 (Ex. 1002).

Based on the Applicant's amendments and on a telephonic interview with the Applicant on January 19, 2006, the Examiner granted all 32 of the Applicant's claims. Notice of Allowability at 1 (Ex. 1002). According to the Examiner, this telephonic interview included discussion of a proposed Examiner's amendment in order to resolve unspecified 112 issues. Notice of Allowability at 2 (Ex. 1002). Specifically, the Examiner amended claim 12, and others, to replace some instances of the phrase "ballast cover" with the phrase "illumination surface." *Id*.

Additionally, according to the Examiner, the claims were deemed allowable because claims 1, 12, 25 and 29 (all of the independent claims) were sufficiently

amended. *Id*. Specifically, the Examiner stated that the prior art of record fails to teach or suggest the combination of structural elements, specifically the ballast/housing with LEDs protruding through being controllable by a wall switch. *Id*. Thus, according to both the Examiner and the Applicant, the inventive aspect of claims 1 and 12 of the '747 patent over the prior art of record was the addition of a controllable wall switch. October 6, 2005 Amendment and Response at 8; Notice of Allowability at 2 (Ex. 1002).

V. CLAIM CONSTRUCTION

A claim in *inter partes* review is given the "broadest reasonable construction in light of the specification in which it appears." 37 C.F.R. § 42.100(b). The broadest reasonable construction is the broadest reasonable interpretation of the claim language. *See In re Yamamoto*, 740 F.2d 1569, 1571-72 (Fed. Cir. 1984). Any claim term which lacks a definition in the specification is therefore also given a broad interpretation. *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007). Should the Patent Owner contend that the claims have a construction different from their broadest reasonable construction in order to avoid the prior art, the appropriate course is for the Patent Owner to seek to amend the claims to expressly correspond to its contentions in this proceeding. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48756, 48764 (Aug. 14, 2012).

A. "An energy-efficient lighting apparatus, comprising" and "An energy-efficient lighting apparatus for retrofit with an existing light fixture having a ballast cover, comprising"

The claim terms "An energy-efficient lighting apparatus, comprising:" and "An energy-efficient lighting apparatus for retrofit with an existing light fixture having a ballast cover, comprising:" are the preambles to claims 1 and 12 of the '747 patent, respectively. These preambles should be construed as not limiting.

"Preamble language that merely states the purpose or intended use of an invention is generally not treated as limiting the scope of a claim." *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006). Here, the preambles to claims 1 and 12 are merely stating the intended use of the claimed lighting apparatus, that is, in an energy-efficient manner, and for claim 12 only, also to be retrofit with an existing light fixture having a ballast cover. Thus, the preamble is merely suggesting benefits or features of the claimed invention without relying on those benefits as patentably significant. *Catalina Marketing International, Inc. v. Coolsavings.com*, *Inc.*, 289 F.3d 801 (Fed. Cir. 2002) ("preamble language merely extolling benefits or features of the claimed invention does not limit the claim scope without clear reliance on those benefits or features as patentably significant."). Indeed, the Applicant of the '747 patent did not rely on any of the features of the preamble to claims 1 or 12 when arguing for patentability of his claimed inventions. October 6, 2005 Amendment and Response at 3, 8 (Ex. 1002). Further, although the

preamble may be found to be limiting when limitations of the claim derive antecedent basis from the preamble (*see Bicon*, 441 F.3d at 952), the Examiner and Applicant removed all such antecedent basis through the Examiner's amendment of claim 12 to replace "ballast cover" with "illumination surface." January 13, 2006 Notice of Allowability at 2 (Ex. 1002). Thus, the preambles of claims 1 and 12 do not provide antecedent basis for any claim limitation. During prosecution of the '747 patent, the Examiner did not understand the preamble of claims 1 or 12 to be limiting. April 27, 2005 Office Action at 2, 4 (Ex. 1002). Therefore, these preambles should be found not to be limiting.

Petitioners include argument regarding the invalidity of claims 1 and 12 below that treat the preambles to both claim as limiting, in the event that the Patent Office disagrees with Petitioners' assertion that that the preambles should be found not to be limiting. For example, Timmermans (Ex. 1009) is asserted solely as prior art in the obviousness combination in Ground 4 to meet "limitations" in the preamble to claim 12 of the '747 patent.

B. "Housing"

The claim term "housing" should be construed to mean "structure that encloses other components."

The specification of the '747 patent supports this construction. For instance, the '747 patent describes Figure 5 as showing a "cut away" section of the housing

"in order to expose circuit board 511" which "may be positioned either partially or wholly inside the housing 528." '747 patent 9:26-35 (Ex. 1001). Likewise, Figure 5 of the '747 patent depicts the circuit board, on which a plurality of light-emitting diodes are mounted, enclosed in a housing. In an unrelated district court case, the Patent Owner admitted that "housing" as used in the '747 patent should be construed to reflect that it "encloses" other components. *Blackbird Technologies v. ELB Electronics, Inc.*, et al., C.A. No. 15-cv-056-RGA (DED), Dkt. No. 82 ("Joint Claim Construction Brief") at 16 (Ex. 1011). Likewise, the district court in *Blackbird* construed "housing" to mean "structure that encloses other components." *Blackbird Technologies v. ELB Electronics, Inc.*, et al., C.A. No. 15-cv-056-RGA (DED), Dkt. No. 89 ("Claim Construction Order") at 2 (Ex. 1012).

In *Blackbird*, the Patent Owner took the position that "housing" should be construed to mean "an enclosure that covers or protects other components," arguing that "'housing' need not be a 'structure.'" Joint Claim Construction Brief at 17 (Ex. 1011). The Patent Owner further took the position that a housing could be "simply a layer of paint." *Id.* at 10. Although Petitioners agree with the district court that the correct construction under *Phillips* is "structure that encloses other components," (*see Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc)), Petitioners do not dispute that the Patent Owner's construction of "an

enclosure that covers or protects other components" may be appropriate under the broadest reasonable construction standard.

C. "Ballast Cover"

The claim term "ballast cover" should be given its plain and ordinary meaning of "cover for a ballast." To the extent a construction beyond the plain and ordinary meaning is required, the claim term "ballast cover" should be construed to mean "structure that encloses wiring."

The specification of the '747 patent supports this construction. For instance, the '747 patent states, "The ballast cover 110 covers the primary wiring to the fixture 101, including the ballast." '747 patent 5:2-4 (Ex. 1001). The '747 patent thus describes a "ballast cover" as the covering for the ballast, or in other words the enclosure that contains the wiring. Thus, to the extent a construction is required, "ballast cover" should be construed as "structure that encloses wiring." The term "ballast cover" was not construed by the district court in the *Blackbird* case. Claim Construction Order (Ex. 1012).

VI. OVERVIEW OF THE PRIMARY PRIOR ART REFERENCES

A. Overview of Ruskouski (Ex. 1004)

U.S. Patent No. 5,410,453 to Ruskouski, entitled "Lighting Device Used in an Exit Sign," was filed on December 1, 1993, and issued on April 25, 1995, is a prior art reference to the '747 patent under 35 U.S.C. § 102(b). As described above,

Ruskouski was cited during the prosecution of the '747 patent, as it was found by the Examiner to disclose every limitation of claims 1 and 12 of the '747 patent other than the "wall switch" limitations added by amendment. April 27, 2005 Office Action at 6-13 (Ex. 1002). Like the '747 patent, Ruskouski is directed towards low light, emergency lighting using LEDs, specifically the use of LEDs in a lighting fixture such as an exit sign. Ruskouski at Abstract (Ex. 1004).

Ruskouski generally relates to electrical lighting sources and, particularly, to electrical lighting sources in illuminated exit signs. Ruskouski 1:5-7 (Ex. 1004). An object of the purported Ruskouski invention is to provide an LED-based exit sign that allows the LEDs to be powered during emergency power situations. Ruskouski 1:44-52 (Ex. 1004); Bretschneider Decl. ¶ 61 (Ex. 1003).

More particularly, Ruskouski discloses "light emitting diode devices" that include:

(1) "an elongated rectangular plastic housing 38A that has front and rear portions 66, 68,"

(2) "The front portion 66 has frustoconical apertures 40A,"

(3) "A circuit board 42A [that] is mounted inside the elongated plastic housing" with "a plurality of light emitting diodes 44 thereon," and

(4) "One light emitting diode 44 is positioned to extend into each of the frustoconical apertures 40" where "the front portion 66 has…

spring clips 70…to interact with openings 72 in rear portion 68 to hold the portions 66, 68 in assembly."

Ruskouski 4:52-62, 5:62-6:2, 6:3-20 (Ex. 1004). Ruskouski's apparatus is shown in Figures 2 and 10 below:

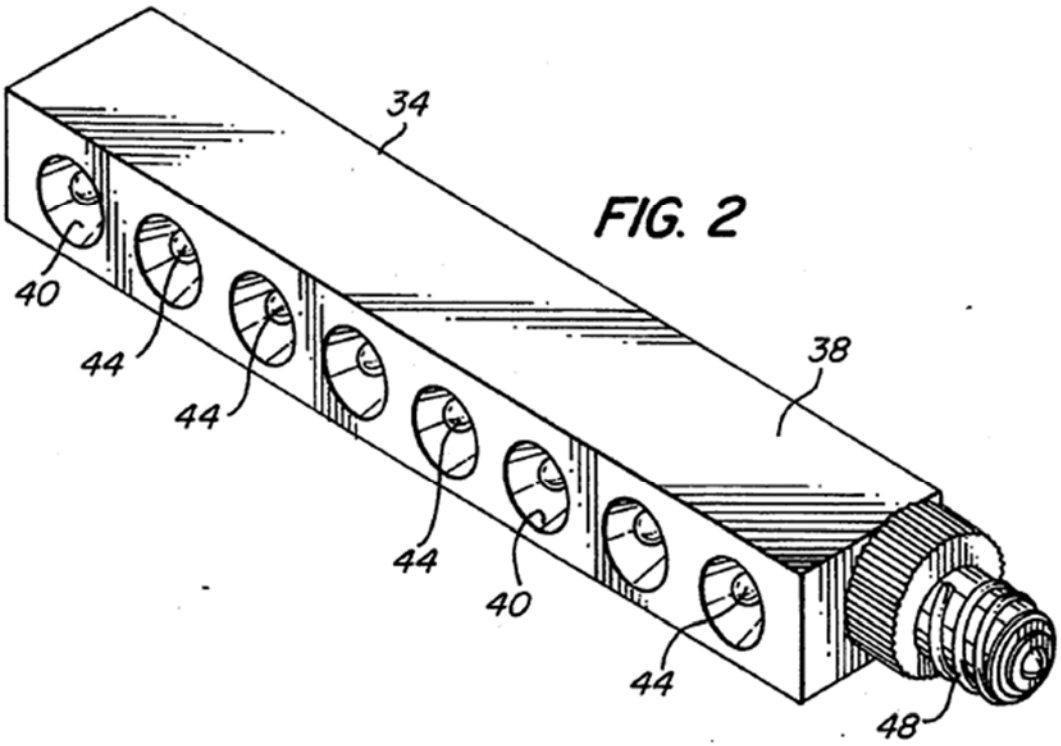

FIG. 2

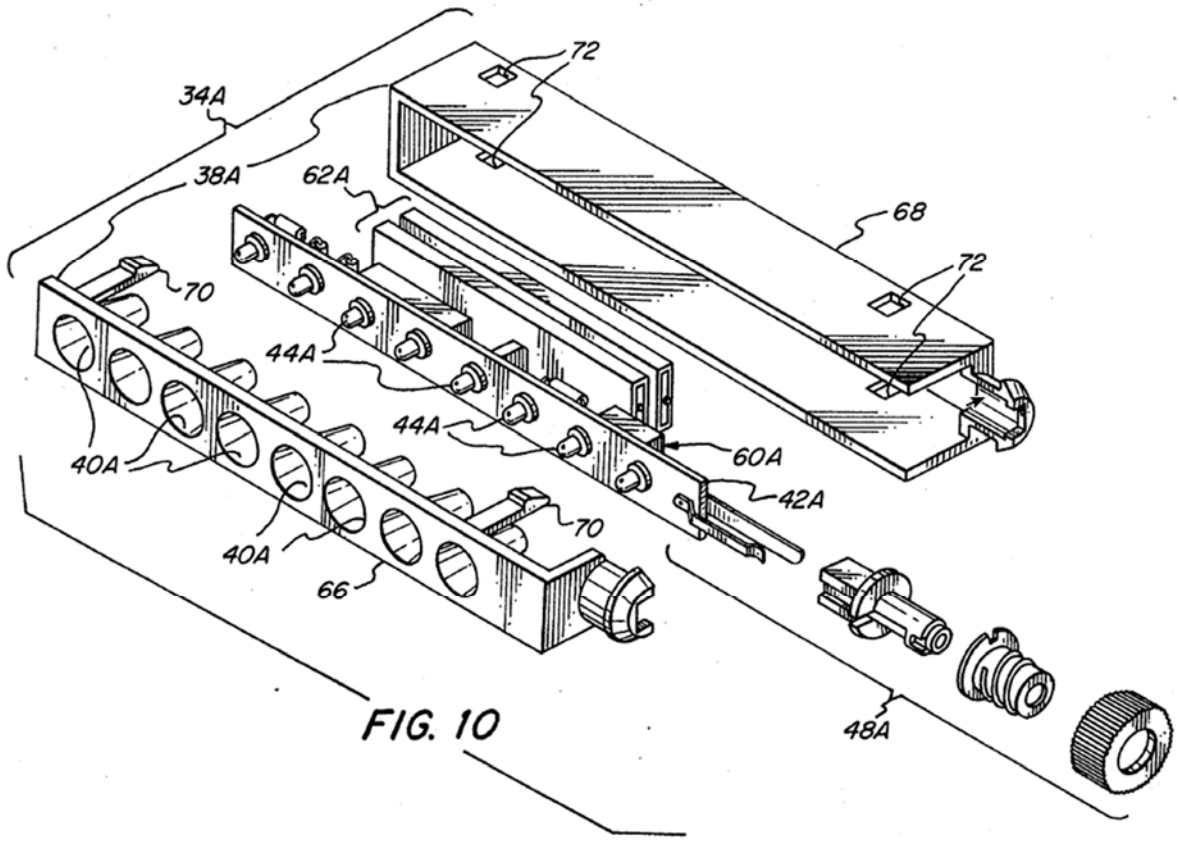

FIG. 10

B. Overview of Teich (Ex. 1005)

U.S. Patent No. 4,323,820 to Teich, entitled "Emergency Lighting System," filed on March 27, 1980, and issued on April 6, 1982, is a prior art reference under 35 U.S.C. § 102(b). Teich was not cited during prosecution of the '747 patent.

Teich discloses an emergency lighting system that is capable of distinguishing between a loss of power due to turning off a wall switch and power loss due to a power failure. Teich at Abstract (Ex. 1005); Bretschneider Decl. ¶ 60 (Ex. 1003). Like the '747 patent, Teich makes use of a wall switch with an

emergency lighting system so that the system will be "capable of distinguishing between a true power line failure and the opening of a wall switch, so as to power the device from a secondary power source only in the case of a true power line failure." Teich 2:20-25 (Ex. 1005). Teich describes one benefit of such a device as solving the problem that at "the end of the day, when the last person leaves the office and turns off the wall switch, usually there is no need for any [emergency] lighting." Teich 1:33-46 (Ex. 1005). Thus, contradicting the Applicant's statements during prosecution of the '747 patent, Teich teaches the use of a wall switch with an exit sign. October 6, 2005 Amendment and Response at 8; (Ex. 1002). Bretschneider Decl. ¶ 62 (Ex. 1003).

C. Overview of Archer (Ex. 1006)

U.S. Patent No. 7,204,602 to Archer, entitled "Light Emitting Diode Pool Assembly," filed on September 9, 2002 and issued on April 17, 2007, is a prior art reference under 35 U.S.C. § 102(e)(2), because it is an issued patent that was filed before the stated priority date of the '747 patent of December 11, 2002. Transmittal of New Application, dated December 11, 2003, at 4 (Ex. 1002). Archer was not cited during prosecution of the '747 patent.

Like the '747 patent, Archer is directed to a "LED lighting assembly," particularly, describing possible use in swimming pools. Archer 1:8-10 (Ex. 1006). Also, like the '747 patent, Archer makes use of an:

> "LED light assembly, the light assembly comprising a reflective plate comprising a plurality of perforations formed therethrough the reflective plate, a plurality of LED bulbs wherein each LED bulb protrudes through a respective perforation of the plurality of perforations, and a control circuit…wherein the control circuit comprises a switch."

Archer at Abstract (Ex. 1006).

Specifically, Archer makes use of a "lightweight fixture, or body 17…connected to [a] plate 12." Archer 4:65-5:6 (Ex. 1006). Archer also describes using an "LED array 16 attached to a printed circuit board subassembly 20, and covered by white plate 12." Archer 5:7-8 (Ex. 1006). Further, Archer discloses that "[e]ach LED bulb 10 is fed through a perforated opening in a white reflective plate 12." Archer 3:28-29 (Ex. 1006). Finally, like the '747 patent, Archer makes use of a wall switch, disclosing that "a switch 50, such as a light switch or a push button switch, is the controller that determines patterns of light emitted by the [LED] array 16. … On[e] skilled in the art will recognize that by toggling, the intent is to transition the light from an on state to an off state and then back to an on state." Archer 5:18-26 (Ex. 1006); Bretschneider Decl. at ¶¶ 98-99. An example of this lighting apparatus in Archer is shown in Figures 1 (front view) and 2 (side view) below, with the light switch depicted in Figure 3 below. Archer Figs. 1, 2, 3, 2:54-61 (Ex. 1006).

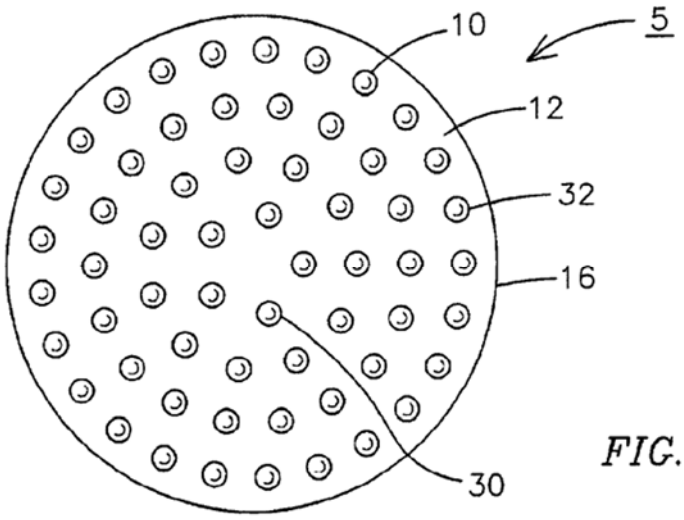

FIG. 1

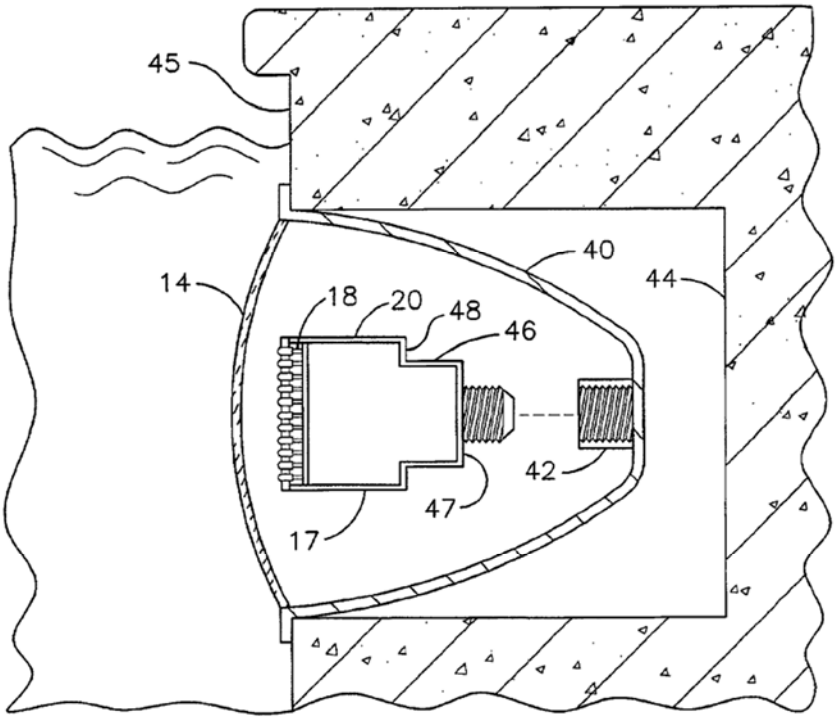

FIG. 2

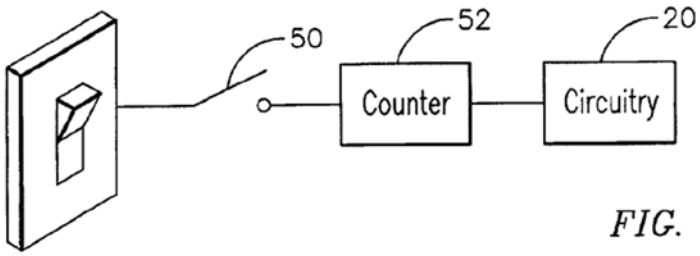

FIG. 3

D. Overview of Ruthenberg (Ex. 1013)

U.S. Patent No. 6,184,628 to Ruthenberg, entitled "Multicolor LED Lamp Bulb for Underwater Pool Lights," filed November 30, 1999, and issued on February 6, 2001, is a prior art reference under 35 U.S.C. § 102(b). Ruthenberg was not cited during prosecution of the '747 patent.

Like the '747 patent, Ruthenberg is directed to "lamp construction using light emitting diode (LED) technology," particularly, describing use in swimming pools and spas. Ruthenberg 1:6-8 (Ex. 1013). Specifically, and like the '747 patent, Ruthenberg describes "a plurality of…light emitting diode (LED) bulbs are mounted… on a circuit board wafer." Ruthenberg 1:56-58 (Ex. 1013); Bretschneider Decl. at ¶ 119. Like the '747 patent, this circuit board comprising LEDs is located "inside the lamp body." Ruthenberg 1:58-62. Like the '747 patent, the lamp body described in Ruthenberg is comprised of two connected surfaces, a "hollow lamp body 12" which includes portions 16, 18, and 20, and a "lens 22…in a watertight and hermetically sealed engagement with…portion 18." Ruthenberg 3:22-37 (Ex. 1013); Bretschneider Decl. at ¶¶ 120, 121. A cross section of this LED

lamp in Ruthenberg is shown in Figure 1 from Ruthenberg, below. Ruthenberg Fig. 1, 3:3-4 (Ex. 1013).

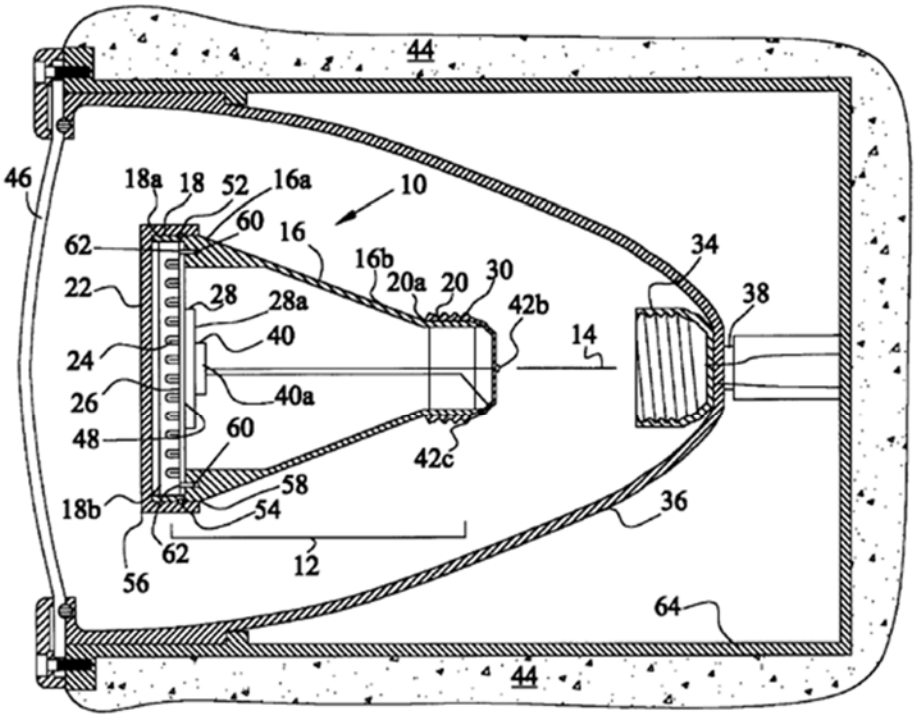

Fig. 1

E. Overview of Hunter (Ex. 1007)

U.S. Patent No. 6,283,612 to Hunter, entitled "Light Emitting Diode Light Strip," filed on March 13, 2000 and issued on September 4, 2001, is a prior art reference under 35 U.S.C. § 102(b). Hunter was not cited during prosecution of the '747 patent.

Hunter discloses "a light strip having diodes mounted on a printed circuit board disposed within a transparent or translucent tube." Hunter 1:5-7 (Ex. 1007).

Like the '747 patent, one stated object of the purported invention in Hunter is "that the use of LED's reduces power consumption to a bare minimum." Hunter 1:27-30 (Ex. 1007); Bretschneider Decl. at ¶ 127 (Ex. 1003). Hunter further discloses that the circuit board is covered by "a reflective surface on its upper face." Hunter 4:40-42 (Ex. 1007). The circuit board, including this reflective surface, is described by Hunter as being fastened to the tube 20 by means of a "pair of end caps 50 [that] captivate the printed circuit board 22 within the tube 20." Hunter 5:30-36 (Ex. 1007). Examples of the light strip disclosed by Hunter are depicted in Figures 1, 11, and 13 below. Hunter Figs. 1, 11, 13 (Ex. 1007).

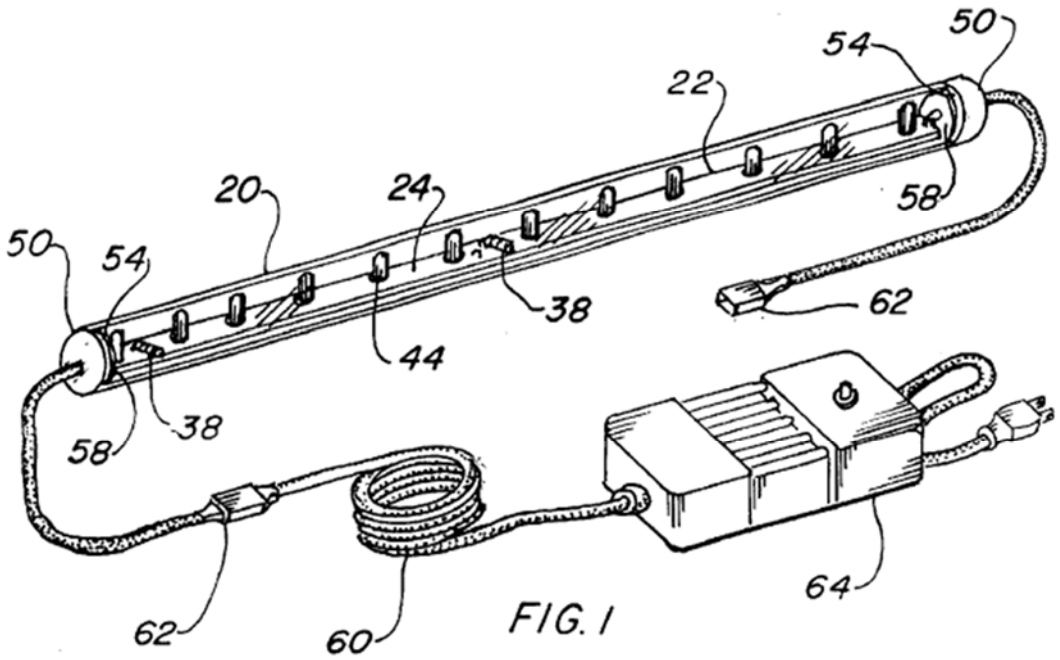

FIG. 1

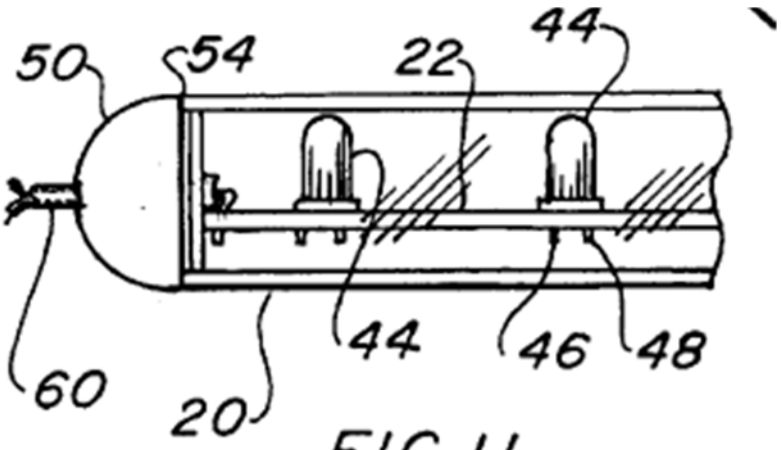

FIG. 11

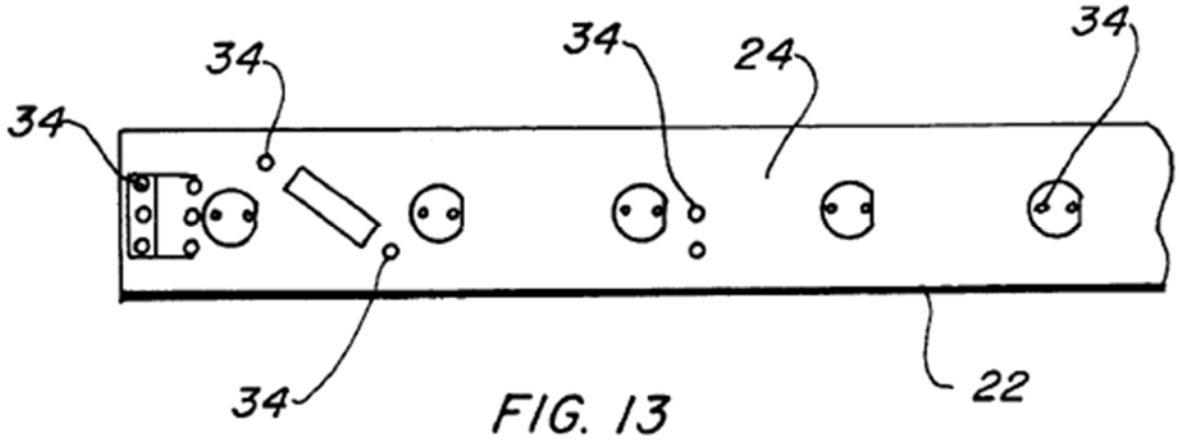

FIG. 13

F. Overview of Kanarek (Ex. 1008)

U.S. Patent No. 5,226,724 to Kanarek, entitled "Modular, User-Installed, Surface-Mounted, Fluorescent Lighting System," filed June 17, 1992, and issued on July 13, 1993, is a prior art reference under 35 U.S.C. § 102(b). Kanarek was not cited during prosecution of the '747 patent.

Like the '747 patent, Kanarek teaches the use of wall switches to control a lighting apparatus, either by plugging the lighting apparatus into an electric outlet controlled by a wall switch or by installing a wall switch on to the power cord of the

lighting apparatus. Kanarek 1:29-42, 4:10-13, 14:1-19 (Ex. 1008); Bretschneider Decl. ¶ 150 (Ex. 1003). Specifically, Kanarek teaches that prior to the purported invention of Kanarek, "lighting fixtures…are provided with a cable that must be plugged into an electrical outlet" and that "[m]any homes since 1960…have wall switches that control room outlets." Kanarek 1:15-42 (Ex. 1008). Kanarek teaches the improvement of a "push-on, push-off or rocker switch…[that] may be installed by the user anywhere along the line cord, to provide on-off control for the entire modular installation." Kanarek 14:1-11 (Ex. 1008). The modules also contain "ballast circuitry for [fluorescent] tube[s]," meaning that the modules act as covers for the ballast. Kanarek 2:64:68 (Ex. 1008). An example of this improvement taught by Kanarek is depicted in Figure 13 of Kanarek below.

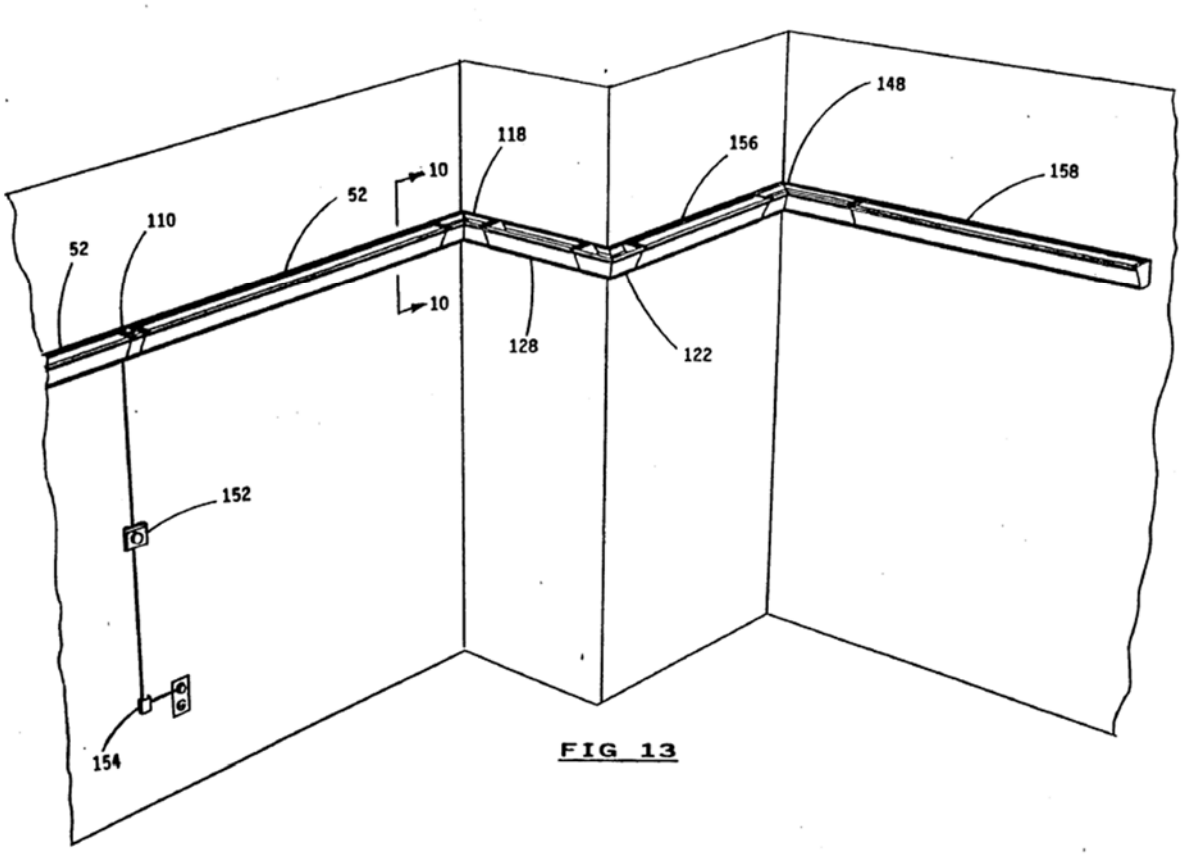

FIG 13

G. Overview of Timmermans (Ex. 1009)

U.S. Patent No. 7,049,761 to Timmermans *et al*., entitled "Light Tube and Power Supply Circuit," filed February 12, 2001, and issued May 23, 2006, is a prior art reference under 35 U.S.C. § 102(b). Timmermans was not cited during prosecution of the '747 patent.

Like the '747 patent, Timmermans teaches a "a light tube for illumination" and a "plurality of light emitting diodes are disposed inside the bulb portion." Timmermans 1:41-47 (Ex. 1009); Bretschneider Decl. ¶¶ 131-132 (Ex. 1003).

Further, one of the stated goals of Timmermans is to "provide a light tube…[that] consume[s] low amounts of power." Timmermans 1:30-36 (Ex. 1009). Another stated goal of Timmermans is for the light tube "to mount within a conventional fluorescent light tube socket," meaning that it is for retrofit into an existing light fixture. Timmermans 1:36-38 (Ex. 1009).

VII. UNPATENTABILITY OF THE CHALLENGED CLAIMS

Pursuant to Rule 42.104(b)(4)-(5), the below section, and as confirmed in the Declaration of Eric Bretschneider (Ex. 1003) demonstrate in detail how the prior art discloses every limitation of the challenged claims of the '747 patent.

A. Ground 1: Claims 1 and 12 Are Obvious over Ruskouski in View of Teich

It would have been obvious to a person of ordinary skill in the art to combine the teachings of Ruskouski and Teich to arrive at the alleged inventions claimed in the '747 patent. As discussed above, Ruskouski is directed towards low light, emergency lighting using LEDs, specifically the use of LEDs in a lighting fixture such as an exit sign. Ruskouski at Abstract (Ex. 1004). As further discussed above, the Examiner during patent prosecution found Ruskouski to disclose every limitation of claims 1 and 12 of the '747 patent, other than those terms that were amended. April 27, 2005 Office Action at 2-4 (Ex. 1002). Further, as explained above, Teich teaches the use of a wall switch with an exit sign that is designed to

turn off the illumination of the exit sign when the wall switch is turned off. Teich 1:33-46, 1:47-62 (Ex. 1005); Bretschneider Decl. ¶ 127 (Ex. 1003).

1. Independent Claim 1

(a) An energy-efficient lighting apparatus, comprising:

To the extent the preamble is found to be limiting, Ruskouski discloses an energy-efficient lighting apparatus. Ruskouski 1:26-43 (Ex. 1004); Bretschneider Decl. ¶¶ 47-49 (Ex. 1003). During prosecution of the '747 patent, the Examiner did not consider the preamble of claim 1 to be limiting. April 27, 2005 Office Action at 2 (Ex. 1002).

(b) a ballast cover;

Ruskouski discloses a ballast cover, which is the elongated housing 38A. Ruskouski Fig. 10 (38A), 6:3-26 (Ex. 1004); Bretschneider Decl. ¶¶ 50-52 (Ex. 1003). As discussed above, the term "ballast cover" should be construed to mean "structure that encloses wiring." The elongated housing 38A is a structure that encloses wiring because it contains the circuit 60A associated with light emitting diodes. Ruskouski Fig. 9, Fig. 9A, Fig. 10 (38A, 60A), 6:3-26 (Ex. 1004); Bretschneider Decl. ¶ 51 (Ex. 1003). During prosecution of the '747 patent, the Examiner considered Ruskouski to disclose a "ballast cover." April 27, 2005 Office Action at 2 (Ex. 1002). The Examiner stated, and the Petitioners agree, that the claimed "ballast cover" is disclosed by element 38A of Ruskouski. *Id*.

(c) a plurality of ballast cover holes in the ballast cover;

Ruskouski discloses "a plurality of ballast cover holes in the ballast cover," which are the frustoconical apertures 40A in the elongated housing 38A. Ruskouski Fig. 10 (40A), 1:67-2:6, 6:3-8 (Ex. 1004); Bretschneider Decl. ¶¶ 53-54 (Ex. 1003). During prosecution of the '747 patent, the Examiner understood Ruskouski to disclose "a plurality of ballast cover holes in the ballast cover." April 27, 2005 Office Action at 2 (Ex. 1002). The Examiner stated, and the Petitioners agree, that the claimed "plurality of ballast cover holes in the ballast cover" is disclosed by element 40A of Ruskouski. *Id*.

(d) a circuit board comprising a plurality of light-emitting diodes,

Ruskouski discloses "a circuit board comprising a plurality of light-emitting diodes," which are the circuit board 42A and the light emitting diodes 44A. Ruskouski Fig. 10 (42A, 44A), 2:22-27, 3:57-60; 5:66-6:8 (Ex. 1004); Bretschneider Decl. ¶¶ 55-56 (Ex. 1003). During prosecution of the '747 patent, the Examiner considered Ruskouski to disclose "a circuit board comprising a plurality of light-emitting diodes." April 27, 2005 Office Action at 2 (Ex. 1002). The Examiner stated, and the Petitioners agree, that the claimed "circuit board" is disclosed by element 42A of Ruskouski and the claimed "comprising a plurality of light-emitting diodes" is disclosed by elements 44A of Ruskouski. *Id*.

(e) wherein the circuit board is positioned adjacent the ballast cover so that the plurality of light-emitting diodes protrude through the plurality of ballast cover holes in the ballast cover,

Ruskouski discloses that " the circuit board is positioned adjacent the ballast cover so that the plurality of light-emitting diodes protrude through the plurality of ballast cover holes in the ballast cover," in that circuit board 42A (the "circuit board") is positioned adjacent to the elongated housing 38A (the "ballast cover") such that the LEDs 44A (the "plurality of light-emitting diodes") protrude through the frustoconical apertures 40A (the "ballast cover holes"). Ruskouski Fig. 10 (38A, 40A, 42A, 44A), 1:67-2:6, 3:60-62; 5:66-6:8 (Ex. 1004); Bretschneider Decl. ¶¶ 57-59 (Ex. 1003). During prosecution of the '747 patent, the Examiner considered Ruskouski to disclose that "the circuit board is positioned adjacent the ballast cover so that the plurality of light-emitting diodes protrude through the plurality of ballast cover holes in the ballast cover." April 27, 2005 Office Action at 2 (Ex. 1002). The Examiner stated, and the Petitioners agree, that the claimed "circuit board is positioned adjacent the ballast cover so that the plurality of light-emitting diodes protrude through the plurality of ballast cover holes in the ballast cover" is disclosed by Figure 10 of Ruskouski. *Id*.

(f) wherein the lighting apparatus is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch.

During prosecution of the '747 patent, the Examiner understood that the prior art of record failed to teach or suggest the combination of the ballast/housing with a plurality of LEDs protruding therethrough being controllable by a wall switch. January 13, 2006 Notice of Allowability at 2 (Ex. 1002). The Examiner, however, did not consider Teich (Ex. 1005). April 27, 2005 Office Action at Notice of References Cited (Ex. 1002).

Teich discloses a "lighting apparatus" through its disclosure of an emergency light, such as an exit sign. Teich 1:10-32 (Ex. 1005); Bretschneider Decl. ¶ 60 (Ex. 1003). Teich further discloses that the lighting apparatus "is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch." Teich 1:4-9, 2:20-25, 2:58-66, 3:6-23, cl. 1 (Ex. 1005); Bretschneider Decl. ¶ 60 (Ex. 1003). A person of ordinary skill in the art at the time of the '747 patent's alleged inventions would understand that Teich teaches an exit sign that is coupled to a wall switch and is designed to illuminate the light-emitting diodes in the exit sign when the wall switch is turned on and turn off the light-emitting diodes in the exit sign when the wall switch is turned off. Bretschneider Decl. ¶ 60 (Ex. 1003)

A person of ordinary skill in the art would have been motivated to combine the teachings of Ruskouski and Teich because both references are in the same field (emergency lighting devices) and address the same problem (the powering of illuminated exit signs in the event of a power failure), in the same way (using a battery backup). Ruskouski 1:8-16, 1:47-52 (Ex. 1004); Teich 1:4-9, 3:18-37 (Ex. 1005); Bretschneider Decl. ¶ 61 (Ex. 1003). It would have been obvious for a person of ordinary skill in the art to combine the exit sign disclosed in Ruskouski with the exit sign attached to a wall switch disclosed in Teich so that the exit sign of Ruskouski could be powered down when desired. Bretschneider Decl. ¶ 62 (Ex. 1003).

Both Ruskouski and Teich teach an exit sign that is designed to use a battery backup in the event of a power failure. Ruskouski 1:8-16, 1:47-51 (Ex. 1004); Teich 1:4-9, 3:18-37 (Ex. 1005); Bretschneider Decl. ¶ 61 (Ex. 1003). Teich improves on an exit sign with a battery backup by allowing a wall switch to turn the exit sign off without engaging the battery backup of the exit sign. Teich 1:4-9, 2:20-25, 2:58-66, 3:6-23, cl. 1 (Ex. 1005); Bretschneider Decl. ¶ 62 (Ex. 1003). A person of ordinary skill in the art at the time of the alleged inventions of the ’747 patent would have understood that this improvement taught in Teich would improve other exit signs employing battery backup systems in the same way, and thus it

would have been obvious to combine the teachings of Ruskouski and Teich to do so. Bretschneider Decl.¶¶ 61-63 (Ex. 1003).

2. Independent Claim 12

(a) An energy-efficient lighting apparatus for retrofit with an existing light fixture having a ballast cover, comprising:

To the extent the preamble of claim 12 is found to be limiting, Ruskouski discloses an energy-efficient lighting apparatus for retrofit with an existing light fixture having a ballast cover. Ruskouski 1:26-43, 1:44-46, 3:41-51, 3:49-51, 4:24-31, 6:3-26 (Ex. 1004); Bretschneider Decl. ¶¶ 64-67 (Ex. 1003). During prosecution of the '747 patent, the Examiner did not consider the preamble of claim 12 to be limiting. April 27, 2005 Office Action at 4 (Ex. 1002).

(b) a housing having an attachment surface and an illumination surface;

Ruskouski discloses a housing, which is the elongated housing 38A. Ruskouski Fig. 10 (38A), 6:3-26 (Ex. 1004); Bretschneider Decl. ¶¶ 68-71 (Ex. 1003). As discussed above, the term "housing" should be construed to mean "structure that encloses other components." The elongated housing 38A is a structure that encloses other components, because it encloses, for example, the circuit board 42A, a rechargeable battery pack 62A, and circuit 60A. Ruskouski Fig. 10 (42A, 60A, 602), 6:3-27 (Ex. 1004); Bretschneider Decl. ¶ 69 (Ex. 1003). The housing has an attachment surface, which is rear portion 68. Ruskouski Fig. 10

(68), 6:3-4 (Ex. 1004); Bretschneider Decl. ¶ 69 (Ex. 1003). The housing also has an illumination surface, which is front portion 66. Ruskouski Fig. 10 (66), 6:3-4 (Ex. 1004); Bretschneider Decl. ¶ 69 (Ex. 1003). During prosecution of the '747 patent, the Examiner considered Ruskouski to disclose "a housing having an attachment surface and an illumination surface." April 27, 2005 Office Action at 4 (Ex. 1002). The Examiner identified the attachment surface as item 72 in Figure 10 of Ruskouski, which the description of Figure 10 explains identifies the the openings in the rear portion rather than the rear portion itself, however, it is clear that the Examiner considered the rear portion 68 to be the "attachment surface" at least because the holes 72 are part of rear portion 68 and the items 72 and 68 appear to point to the same component. April 27, 2005 Office Action at 4 (Ex. 1002); Ruskouski 10 (68, 72), 6:3-8 (Ex. 1004); Bretschneider Decl. ¶ 70 (Ex. 1003).

(c) a plurality of illumination surface holes in the illumination surface;

Ruskouski discloses "a plurality of illumination surface holes in the illumination surface," which are the frustoconical apertures 40A that are holes in the front portion 66 in the elongated housing 38A. Ruskouski Fig. 10 (40A), 1:67-2:6, 6:3-8 (Ex. 1004); Bretschneider Decl. ¶ 72-73 (Ex. 1003). During prosecution of the '747 patent, the Examiner considered Ruskouski to disclose "a plurality of ballast cover holes in the ballast cover." April 27, 2005 Office Action at 2 (Ex.

1002). The Examiner stated, and the Petitioners agree, that the claimed "plurality of illumination surface holes in the illumination surface" is disclosed by elements 40A of Ruskouski. *Id*.

(d) a circuit board comprising a plurality of light-emitting diodes,

Ruskouski discloses "a circuit board comprising a plurality of light-emitting diodes," which are the circuit board 42A and the light emitting diodes 44A. Ruskouski Fig. 10 (42A, 44A), 2:22-27, 3:57-60; 5:66-6:2, 6:3-8 (Ex. 1004); Bretschneider Decl. ¶ 74-75 (Ex. 1003). During prosecution of the '747 patent, the Examiner considered Ruskouski to disclose "a circuit board comprising a plurality of light-emitting diodes." April 27, 2005 Office Action at 4 (Ex. 1002). The Examiner stated, and the Petitioners agree, that the claimed "circuit board" is disclosed by element 42A" and the disclosed "plurality of light-emitting diodes" is disclosed by elements 44A of Ruskouski. *Id*.

(e) wherein the circuit board is positioned adjacent the housing so that the plurality of light-emitting diodes protrude through the plurality of illumination surface holes in the illumination surface;

Ruskouski discloses that "the circuit board is positioned adjacent the housing so that the plurality of light-emitting diodes protrude through the plurality of illumination surface holes in the illumination surface," in that circuit board 42A (the "circuit board") is positioned adjacent to the elongated housing 38A (the "housing")

so that the LEDs 44A (the "plurality of light-emitting diodes") protrude through the frustoconical apertures 40A (the "plurality of surface holes") in the front surface 66 (the "illumination surface"). Ruskouski Fig. 10 (38A, 40A, 42A, 44A), 1:67-2:6, 3:60-4:7; 5:66-6:8 (Ex. 1004); Bretschneider Decl. ¶¶ 76-78 (Ex. 1003). During prosecution of the '747 patent, the Examiner considered Ruskouski to disclose that "the circuit board is positioned adjacent the housing so that the plurality of light-emitting diodes protrude through the plurality of illumination surface holes in the illumination surface." April 27, 2005 Office Action at 4 (Ex. 1002). The Examiner stated, and the Petitioners agree, that the claimed "circuit board is positioned adjacent the housing so that the plurality of light-emitting diodes protrude through the plurality of illumination surface holes in the illumination surface" is disclosed by Figure 10 of Ruskouski. *Id*.

(f) a fastening mechanism for securing the attachment surface of the lighting apparatus to the illumination surface,

Ruskouski discloses "a fastening mechanism for securing the attachment surface of the lighting apparatus to the illumination surface" which is the spring clips 70 of front portion 66 that interact with openings 72 to secure the illumination surface to rear portion 68. Ruskouski Fig. 10 (38A, 40A, 42A, 44A), 1:67-2:6, 3:60-62; 5:66-6:8 (Ex. 1004); Bretschneider Decl. ¶¶ 79-80 (Ex. 1003). During prosecution of the '747 patent, the Examiner considered Ruskouski to disclose a

fastening mechanism for securing the attachment surface of the lighting apparatus to the ballast cover. April 27, 2005 Office Action at 4 (Ex. 1002). The Examiner understood Ruskouski to disclose a ballast cover in Figure 10, items 66 and 68. *Id.* The Examiner further understood item 66 to disclose an illumination surface. *Id.* Thus, the Examiner understood item 66 of Figure 10 to be both part of the "ballast cover" of claim 1 and the "illumination surface" of claim 12. The Examiner also amended claim 12, line 10 by replacing "ballast cover" with "illumination surface" in order to resolve "112 issues." January 13, 2006 Notice of Allowability at 2 (Ex. 1002). Thus, the Examiner's understanding that Ruskouski disclosed "a fastening mechanism for securing the attachment surface of the lighting apparatus to the ballast cover" is also an understanding that Ruskouski discloses "a fastening mechanism for securing the attachment surface of the lighting apparatus to the illumination surface."

(g) wherein the lighting apparatus is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch.

During prosecution of the '747 patent, the Examiner understood that "the prior art of record fails to teach or suggest the combination of…the ballast/housing with a plurality of LEDs protruding therethrough being controllable by a wall switch." January 13, 2006 Notice of Allowability at 2 (Ex. 1002). The Examiner,

however, did not consider Teich (Ex. 1005). April 27, 2005 Office Action at Notice of References Cited (Ex. 1002).

Teich discloses a "lighting apparatus" in that it discloses an emergency light, such as an exit sign. Teich 1:10-32 (Ex. 1005); Bretschneider Decl. ¶ 81 (Ex. 1003). Teich further discloses that the lighting apparatus "is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch." Teich 1:4-9, 2:20-25, 2:58-66, 3:6-23, cl. 1 (Ex. 1005); Bretschneider Decl. ¶ 81 (Ex. 1003). A person of ordinary skill in the art at the time of the '747 patent alleged inventions would understand that Teich teaches an exit sign that is coupled to a wall switch and is designed to illuminate the light-emitting diodes in the exit sign when the wall switch is turned on and turn off the light-emitting diodes in the exit sign when the wall switch is turned off. Bretschneider Decl. ¶ 81 (Ex. 1003)

A person of ordinary skill in the art would have been motivated to combine the teachings of Ruskouski and Teich because both references are in the same field (emergency lighting devices) and address the same problem (the powering of illuminated exit signs in the event of a power failure), in the same way (using a battery backup). Ruskouski 1:8-16, 1:47-52 (Ex. 1004); Teich 1:4-9, 3:18-37 (Ex. 1005); Bretschneider Decl. ¶ 82 (Ex. 1003). It would have been obvious for a person of ordinary skill in the art to combine the exit sign disclosed in Ruskouski

with the exit sign attached to a wall switch disclosed in Teich so that the exit sign of Ruskouski could be powered down when desired. Bretschneider Decl. ¶¶ 82-85 (Ex. 1003).

Both Ruskouski and Teich teach an exit sign that is designed to use a battery backup in the event of a power failure. Ruskouski 1:8-16, 1:47-51 (Ex. 1004); Teich 1:4-9, 3:18-37 (Ex. 1005); Bretschneider Decl. ¶ 82 (Ex. 1003). Teich improves on an exit sign with a battery backup by allowing a wall switch to turn the exit sign off without engaging the battery backup of the exit sign. Teich 1:4-9, 2:20-25, 2:58-66, 3:6-23, cl. 1 (Ex. 1005); Bretschneider Decl. ¶ 83 (Ex. 1003). A person of ordinary skill in the art at the time of the alleged inventions of the '747 patent would have understood that this improvement taught in Teich would improve other exit signs employing battery backup systems in the same way, and thus it would have been obvious to combine the teachings of Ruskouski and Teich to do so. Bretschneider Decl. ¶¶ 83-85 (Ex. 1003).

B. Ground 2: Claims 1 and 12 Are Anticipated by Archer

The teachings of Archer disclose each and every limitation of the alleged inventions claimed in claims 1 and 12 of the '747 patent. As discussed above, Archer makes use of a "lightweight fixture, or body 17…connected to [a] plate 12." Archer 4:65-5:6 (Ex. 1006). Archer further makes use of an "LED array 16 attached to a printed circuit board subassembly 20, and covered by white plate 12." Archer

5:7-8 (Ex. 1006). Further, Archer discloses that "[e]ach LED bulb 10 is fed through a perforated opening in a white reflective plate 12." Archer 3:28-29 (Ex. 1006). Finally, like the '747 patent, Archer makes use of a wall switch, disclosing that "a switch 50, such as a light switch or a push button switch, is the controller that determines patters of light emitted by the [LED] array 16. … On[e] skilled in the art will recognize that by toggling, the intent is to transition the light from an on state to an off state and then back to an on state." Archer 5:18-26 (Ex. 1006); Bretschneider Decl. ¶¶ 98-99 (Ex. 1003).

1. Independent Claim 1

(a) An energy-efficient lighting apparatus, comprising:

To the extent the preamble is found to be limiting, Archer discloses an energy-efficient lighting apparatus. Archer 3:38-49, 5:43-55 (Ex. 1006); Bretschneider Decl. ¶¶ 86-88 (Ex. 1003). During prosecution of the '747 patent, the Examiner did not understand the preamble of claim 1 to be limiting. April 27, 2005 Office Action at 2 (Ex. 1002).

(b) a ballast cover;

Archer discloses a ballast cover, which is the lightweight fixture, or body 17 shown as having an inverted stair step configuration 46 connected to the plate 12. Archer Fig. 2 (17, 46, 12), 4:65-5:8, 6:3-26 (Ex. 1006); Bretschneider Decl. ¶¶ 89-91 (Ex. 1003). As discussed above, the term "ballast cover" should be construed to

mean "structure that encloses wiring." The inverted stair step configuration 46 of body 17 connected to plate 12 encloses wiring because the circuit 20 is described as being located within this configuration. Archer 4:54-5:17 (Ex. 1006); Bretschneider Decl. ¶ 90 (Ex. 1003).

(c) a plurality of ballast cover holes in the ballast cover;

Archer discloses "a plurality of ballast cover holes in the ballast cover," which are perforations in the plate 12 of the ballast cover 17. Archer Fig. 1., Fig. 2 (LEDs 10 protruding through holes in plate 12 attached to leads 18 protruding through plate), 2:2-7, 2:22-27, 2:39-42, 3:28-29, 3:40-42, 5:66-67 (Ex. 1006); Bretschneider Decl. ¶¶ 92-93 (Ex. 1003).

(d) a circuit board comprising a plurality of light-emitting diodes,

Archer discloses "a circuit board comprising a plurality of light-emitting diodes," which is the printed circuit board assembly 20 and the light emitting diodes 10. Archer Fig. 1, 2 (10, 20), 1:66-2:15, 2:16-36, 3:17-27, 3:38-59, 5:7-8 (Ex. 1006); Bretschneider Decl. ¶¶ 94-95 (Ex. 1003).

(e) wherein the circuit board is positioned adjacent the ballast cover so that the plurality of light-emitting diodes protrude through the plurality of ballast cover holes in the ballast cover,

Archer discloses that "the circuit board is positioned adjacent the ballast cover so that the plurality of light-emitting diodes protrude through the plurality of

ballast cover holes in the ballast cover," in that circuit board 20 (the "circuit board") is positioned adjacent to the plate 12 (the "ballast cover") such that the LEDs 10 (the "plurality of light-emitting diodes") protrude through the perforations in the plate 12 (the "ballast cover holes"). Archer Fig. 1, 2 (10, 20), 2:2-7, 2:22-27, 3:28-29, 5:66-67 (Ex. 1006); Bretschneider Decl. ¶¶ 96-97 (Ex. 1003).

(f) wherein the lighting apparatus is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch.

Archer discloses that "the lighting apparatus is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch" in that the lighting apparatus is coupled to switch 50 (the "wall switch") that is used to control the illumination of the light emitting diodes based upon the position of the switch. Archer Fig. 3 (50), 2:10-15, 2:31-36, 5:18-42 (Ex. 1006); Bretschneider Decl. ¶¶ 98-99 (Ex. 1003).

2. Independent Claim 12

(a) An energy-efficient lighting apparatus for retrofit with an existing light fixture having a ballast cover, comprising:

To the extent the preamble is found to be limiting, Archer discloses an energy-efficient lighting apparatus for retrofit with an existing light fixture having a ballast cover. Archer 3:38-49, 4:54-5:6, 5:43-55 (Ex. 1006); Bretschneider Decl. ¶¶ 100-102 (Ex. 1003). Specifically, Archer discloses "that it is designed to retrofit

existing pool lighting fixtures 40" and that the "existing fixtures…typically use a high wattage incandescent lamp screwed into a standard Edison-style base 52 housed within the fixture 40" which corresponds to the "lighting apparatus for retrofit with an existing light fixture having a ballast cover" claimed by claim 12 of the '747 patent. Archer 3:38-49, 4:54-5:6 (Ex. 1006). Additionally, Archer discloses using LEDs, including "an LED lighting assembly that may operate with a low voltage" that corresponds to the "energy-efficient lighting apparatus" claimed by claim 12 of the '747 patent. During prosecution of the '747 patent, the Examiner did not understand the preamble of claim 12 to be limiting. April 27, 2005 Office Action at 4 (Ex. 1002).

(b) a housing having an attachment surface and an illumination surface;

Archer discloses a housing having an attachment surface and an illumination surface, which is the lightweight fixture or body 17 (the "housing") comprising an inverted stair step configuration 46 (the "attachment surface") connected to the plate 12 (the "illumination surface"). Archer Fig. 2 (17, 46, 12), 4:65-5:6, 5:7-8, 6:3-26 (Ex. 1006); Bretschneider Decl. ¶¶ 103-105 (Ex. 1003). As discussed above, the term "housing" should be construed to mean "structure that encloses other components." The stair step configuration 46 is connected to plate 12 to form the body 17, which encloses wiring because the circuit 20 is described as being located

within this configuration. Archer 4:54-5:17 (Ex. 1006); Bretschneider Decl. ¶ 104 (Ex. 1003).

(c) a plurality of illumination surface holes in the illumination surface;

Archer discloses "a plurality of illumination surface holes in the illumination surface," which are the perforations (the "illumination surface holes") in the plate 12 (the "illumination surface"). Archer Fig. 2 (LEDs attached to leads 18 protruding through plate), 2:2-7, 2:22-27, 2:39-42, 3:28-29, 3:40-42, 5:66-67 (Ex. 1006); Bretschneider Decl. ¶¶ 106-107 (Ex. 1003).

(d) a circuit board comprising a plurality of light-emitting diodes,

Archer discloses "a circuit board comprising a plurality of light-emitting diodes," which is the printed circuit board assembly 20 and the light emitting diodes 10. Archer Figs. 1, 2 (10, 20), 1:66-2:11, 2:16-31, 3:17-27, 3:38-59, 5:7-17 (Ex. 1006); Bretschneider Decl. ¶¶ 108-109 (Ex. 1003).

(e) wherein the circuit board is positioned adjacent the housing so that the plurality of light-emitting diodes protrude through the plurality of illumination surface holes in the illumination surface;

Archer discloses that "the circuit board is positioned adjacent the housing so that the plurality of light-emitting diodes protrude through the plurality of illumination surface holes in the illumination surface," in that circuit board 20 (the "circuit board") is positioned adjacent to the plate 12 (the "illumination surface")

such that the LEDs 10 (the "plurality of light-emitting diodes") protrude through the perforations in the plate 12 (the "illumination surface holes in the illumination surface"). Archer Figs. 1, 2 (10, 20), 2:2-9, 2:22-31, 3:28-37, 5:66-67 (Ex. 1006); Bretschneider Decl. ¶¶ 110-111 (Ex. 1003).

(f) a fastening mechanism for securing the attachment surface of the lighting apparatus to the illumination surface,

Archer discloses "securing the attachment surface of the lighting apparatus to the illumination surface" in that plate 12 (the "illumination surface") is disclosed as being "connected" to the inverted stair step configuration 46 (the "attachment surface"). Archer Fig. 2, 4:60-5:6 (Ex. 1006); Bretschneider Decl. ¶¶ 112-113 (Ex. 1003). Although no mechanism is expressly disclosed in Archer for securing the plate 12 to the inverted stair step configuration 46, one of ordinary skill in the art would have understood that such a mechanism is necessarily present, or inherent, in Archer. Bretschneider Decl. ¶ 112 (Ex. 1003). For example, Figure 2 of Archer depicts the plate 12 (not numbered, but containing the protruding LEDs) adjacent to the inverted stair step configuration 46, and the specification describes the plate 12 and the inverted stair step configuration 46 as being "connected." Archer Fig. 2, 4:60-5:6 (Ex. 1006); Bretschneider Decl. ¶ 112 (Ex. 1003). One of ordinary skill in the art would understand the description of "connected" in Archer to mean secured together. Bretschneider Decl. ¶ 112 (Ex. 1003). A person of ordinary skill in the art

would further understand that Archer's description of these two components being "connected" means that Archer must necessarily make use of a fastening mechanism, otherwise the housing would fall apart and would not be connected, as disclosed. *Id*. In other words, one of ordinary skill in the art would understand that the plate 12 and the inverted stair step configuration 46 could not be connected to one another as described in Archer unless a mechanism was present for securing these two elements together. *Id*. Finally, a person of ordinary skill in the art would understand that the plate 12 and the inverted stair step configuration 46 must necessarily be secured together because the lighting apparatus is designed to be installed on its side in a recessed niche in a swimming pool and a fastening mechanism would be required for a lighting device situated on its side in such a swimming pool niche to stay together and remain connected in order to be operable. Archer Fig. 2 (Ex. 1006); Bretschneider Decl. ¶ 112 (Ex. 1003). Thus a fastening mechanism is necessarily, and inherently, disclosed in Archer.

(g) wherein the lighting apparatus is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch.

Archer discloses that "the lighting apparatus is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch" in that the lighting apparatus is coupled to switch 50

(the "wall switch") that is used to control the illumination of the light emitting diodes based upon the position of the switch. Archer Fig. 3 (50), 2:10-15, 2:31-36, 5:18-42 (Ex. 1006); Bretschneider Decl. ¶¶ 114-116 (Ex. 1003).

C. Ground 3: Claim 12 is Obvious over Archer in view of Ruthenberg

This ground renders obvious claim 12 of the '747 patent for the same reasons as discussed in section VII(B)(2), above, with the exception of the "a fastening mechanism for securing the attachment surface of the lighting apparatus to the illumination surface" limitation of the '747 patent. To the extent the Board determines that Archer does not inherently teach a "fastening mechanism," it would have been obvious to a person of ordinary skill in the art at the time of the '747 patent to combine the teachings of Archer with the teachings of the "fastening mechanism" described in Ruthenberg to arrive at the alleged invention of claim 12 of the '747 patent.

As discussed above, Ruthenberg is directed to "lamp construction using light emitting diode (LED) technology," particularly, describing use in swimming pools and spas. Ruthenberg 1:6-8 (Ex. 1013). Specifically, and like the '747 patent, Ruthenberg describes "a plurality of…light emitting diode (LED) bulbs are mounted… on a circuit board wafer." Ruthenberg 1:56-58 (Ex. 1013); Bretschneider Decl. ¶ 119 (Ex. 1003). Like the '747 patent, this circuit board comprising LEDs is located "inside the lamp body." Ruthenberg 1:58-65 (Ex.

1013). Like the '747 patent, the lamp body described in Ruthenberg is comprised of two connected surfaces, a "hollow lamp body 12" which includes portions 16, 18, and 20, and a "lens 22…in a watertight and hermetically sealed engagement with…portion 18." Ruthenberg 3:22-37 (Ex. 1013).

Archer and Ruthenberg both teach LED swimming pool lamps of a similar design with two parts comprising a lamp body. Archer 1:8-10 (Ex. 1006); Ruthenberg 1:6-8 (Ex. 1013); Bretschneider Decl. ¶ 120 (Ex. 1003). Both devices include a "housing" that include a body connected to an end cap; in Archer the body is the "inverted stair step configuration 46" and the end cap is "the plate 12," while in Ruthenberg the body is the "hollow lamp body 12" and the "lens 22." Archer Fig. 2, 4:60-5:6 (Ex. 1006); Ruthenberg Fig. 1, 3:22-37 (Ex. 1013); Bretschneider Decl. ¶ 120 (Ex. 1003). Both of these bodies connected to end caps disclose a "housing" as claimed by claim 12 of the '747 patent, because both are structures that enclose the respective disclosed circuit boards. Archer Fig. 2, 4:54-5:17 (Ex. 1006); Ruthenberg Fig. 1, 1:58-62, 3:28-58 (Ex. 1013); Bretschneider Decl. ¶ 120 (Ex. 1003). Archer describes the body as "connected" to the end cap, as discussed above. Archer Fig. 2, 4:60-5:6 (Ex. 1006). Ruthenberg describes a specific mechanism for fastening the body to the end cap. Bretschneider Decl. ¶ 121 (Ex. 1003).

Specifically Ruthenberg teaches "a fastening mechanism for securing the attachment surface of the lighting apparatus to the illumination surface" which is the "ridge portion 52" and the "mating recess portion 54." Ruthenberg Fig. 1 (52, 54), 5:1-4 (Ex. 1013); Bretschneider Decl. ¶ 121 (Ex. 1003). Ruthenberg teaches that "hollow body 12" (the "attachment surface,") includes parts 16, 18 and 20, and that part 18 "includes a ridge portion 52." Ruthenberg 3:22-33 (Ex. 1013). Ruthenberg also teaches that lens 22 (the "illumination surface") contains a "mating recess portion 54." Ruthenberg Fig 1 (22, 54), 5:2 (Ex. 1013). Further, Ruthenberg discloses that the ridge portion 52 "cooperatively engages" the mating recess portion 54. Ruthenberg 5:1-4 (Ex. 1013). Ruthenberg describes the result of this fastening as a "watertight and hermetically sealed engagement," which is a description of "securing the attachment surface of the lighting apparatus to the illumination surface" claimed in claim 12 of the '747 patent. Ruthenberg 3:34-37 (Ex. 1013); Bretschneider Decl. ¶¶ 121, 124 (Ex. 1003).

A person of ordinary skill in the art at the time of the invention would have combined the fastening mechanism described in Ruthenberg with the lighting apparatus described in Archer to arrive at the alleged invention of claim 12 of the '747 patent. Bretschneider Decl. ¶¶ 122-125 (Ex. 1003). A person of ordinary skill in the art would have been motivated to combine the teachings of Archer and Ruthenberg because an express motivation to combine Ruthenberg with Archer

appears in Archer, which touts Ruthenberg as an example of "known LED lighting assemblies for in-ground pools that house LED arrays" and "use of predetermined arrays of a plurality of different colored LED bulbs to replace an incandescent pool light." Archer 1:45-63 (Ex. 1006); Bretschneider Decl. ¶ 122 (Ex. 1003). Thus, it would have been obvious to one of ordinary skill in the art to look to Ruthenberg to determine how to secure the plate 12 to the inverted stair step configuration 46 of Archer in a manner which "connects" these two elements, as disclosed by Archer. Archer Fig. 2, 4:60-5:6 (Ex. 1006); Bretschneider Decl. ¶ 122 (Ex. 1003).

Additionally, a person of ordinary skill in the art would have been motivated to combine the teachings of Archer and Ruthenberg because both references are in the same field (underwater pool lights) and address the same problem (improvements on LED technology for underwater use) in the same way (use of multicolor LED lamp bulbs). Bretschneider Decl. ¶ 123 (Ex. 1003).

Further, a person of ordinary skill in the art would have been motivated to substitute the connected housing of Archer with the housing secured with a fastening mechanism of Ruthenberg because such a substitution would have produce a predictable result. Specifically, the alleged invention of claim is created through substitution of the body and end cap that are "connected," as disclosed in Archer, with the body and end cap that are connected through use of the "fastening mechanism" disclosed in Ruthenberg. Bretschneider Decl. ¶ 124 (Ex. 1003). This

substitution would have yielded the predictable result of the body and the end cap being secured to one another, as described in Ruthenberg. Ruthenberg 3:34-37 (Ex. 1013); Bretschneider Decl. ¶ 124 (Ex. 1003). Thus it would have been obvious to a person of ordinary skill in the art at the time of the '747 patent to combine the teachings of Archer with the teachings of the "fastening mechanism" described in Ruthenberg to arrive at the alleged invention of claim 12 of the '747 patent.

D. Ground 4: Claim 12 Is Obvious over Hunter in view of Kanarek and Timmermans

In the event that the Board determines that the preamble to claim 12 is limiting (Petitioners contend that it is not), it would have been obvious to a person of ordinary skill in the art to combine the teachings of Hunter with the teachings of Kanarek and Timmermans to arrive at the alleged invention claimed in claim 12 of the '747 patent. As discussed above, Hunter discloses "a light strip having diodes mounted on a printed circuit board disposed within a transparent or translucent tube." Hunter 1:5-7 (Ex. 1007). Hunter further discloses that the circuit board is covered by "a reflective surface on its upper face." Hunter 4:40-42 (Ex. 1007). The circuit board, including this reflective surface, is described by Hunter as being fastened to the tube 20 by means of a "pair of end caps 50 [that] captivate the printed circuit board 22 within the tube 20." Hunter 5:30-36 (Ex. 1007). Like the '747 patent, one stated object of the purported invention in Hunter is "that the use of

LED's reduces power consumption to a bare minimum." Hunter 1:27-30 (Ex. 1007); Bretschneider Decl. ¶ 127 (Ex. 1003).

Also, as discussed above, Kanarek teaches the use of wall switches to control a lighting apparatus, either by plugging a lighting apparatus into an electric outlet controlled by a wall switch or by installing a wall switch on the power cord of a lighting apparatus. Kanarek 1:29-42, 4:10-13, 14:1-19 (Ex. 1008); Bretschneider Decl. ¶ 150 (Ex. 1003). Specifically, Kanarek teaches that prior to the purported invention of Kanarek, "lighting fixtures…are provided with a cable that must be plugged into an electrical outlet" and that "[m]any homes since 1960…have wall switches that control room outlets." Kanarek 1:15-42 (Ex. 1008). Kanarek teaches the improvement of a "push-on, push-off or rocker switch…[that] may be installed by the user anywhere along the line cord, to provide on-off control for the entire modular installation." Kanarek 14:1-11 (Ex. 1008); Bretschneider Decl. ¶ 152 (Ex. 1003). The modules also contain "ballast circuitry for [fluorescent] tube[s]," meaning that the modules act as covers for the ballast. Kanarek 2:64-68 (Ex. 1008); Bretschneider Decl. ¶ 129 (Ex. 1003).

Further, as discussed above, Timmermans teaches "a light tube for illumination" and a "plurality of light emitting diodes are disposed inside the bulb portion" of the light tube. Timmermans 1:41-47 (Ex. 1009). Further, one of the stated goals of Timmermans is to "provide a light tube…[that] consume[s] low

amounts of power." Timmermans 1:30-36 (Ex. 1009). Another stated goal of Timmermans is for the light tube "to mount within a conventional fluorescent light tube socket," meaning that it is for retrofit into an existing light fixture. Timmermans 1:36-38 (Ex. 1009).

If the Board determines that the preamble to claim 12 is not limiting, as Petitioners contend, then Petitioners do not seek to rely on Timmermans in this Ground because it would have been obvious to a person of ordinary skill in the art to combine the teachings of Hunter with the teachings of Kanarek to arrive at the alleged invention claimed in claim 12 of the '747 patent. As described above, Hunter discloses "a light strip having diodes mounted on a printed circuit board disposed within a transparent or translucent tube." Hunter 1:5-7 (Ex. 1007). This lighting apparatus is plugged into an electrical outlet in a wall by a power cord. Hunter Fig. 7 (58), Fig. 5 (50), Fig. 8 (58), 6:51-65. As discussed above, Kanarek describes improving a lighting apparatus plugged into a wall by either coupling the electrical outlet in the wall to a wall switch, or adding a wall switch to the power cord. Kanarek Fig. 13 (152), 4:10-13, 14:1-15 (Ex. 1008). In both cases described in Kanarek, a wall switch is used to control the lighting apparatus. Kanarek Fig. 13 (152) 4:10-13, 14:1-15 (Ex. 1008).

1. Independent Claim 12

(a) An energy-efficient lighting apparatus for retrofit with an existing light fixture having a ballast cover, comprising:

If the Board determines that the preamble to claim 12 is not limiting, then Petitioners contend that Hunter discloses an energy-efficient lighting apparatus. Hunter 2:26-40 (Ex. 1007); Bretschneider Decl. ¶ 127 (Ex. 1003). During prosecution of the '747 patent, the Examiner did not understand the preamble of claim 12 to be limiting. April 27, 2005 Office Action at 2 (Ex. 1002).

Alternatively, if the Board determines that the preamble to claim 12 is limiting, then Petitioners contend that Hunter in combination with Kanarek and Timmermans discloses the preamble. Hunter discloses an energy-efficient lighting apparatus and Kanarek further teaches a "light fixture having a ballast cover" in that it teaches a modular lighting system with each module holding a single fluorescent tube and the necessary ballast circuitry for that tube. Hunter 2:26-40 (Ex. 1007); Kanarek 2:64-3:3 (Ex. 1008); Bretschneider Decl. ¶¶ 127-129 (Ex. 1003). As discussed above, the term "ballast cover" should be construed to mean "structure that encloses wiring." In Kanarek, the wiring of the circuitry is expressly disclosed as a "ballast" and is enclosed by a module. Kanarek 2:64-3:3 (Ex. 1008).

Furthermore, if the Board finds that the preamble to claim 12 is limiting, Timmermans discloses "an energy efficient lighting apparatus for retrofit with an

existing light fixture." As described above, one of the stated goals of Timmermans is to "provide a light tube…[that] consume[s] low amounts of power," meaning that Timmermans discloses "an energy efficient lighting apparatus." Timmermans 1:30-36 (Ex. 1009); Bretschneider Decl. ¶ 130 (Ex. 1003). Another stated goal of Timmermans is for the light tube "to mount within a conventional fluorescent light tube socket," meaning that Timmermans teaches a lighting apparatus for retrofit into an existing light fixture." Timmermans 1:36-38 (Ex. 1009); Bretschneider Decl. ¶¶ 130-131 (Ex. 1003).

One of ordinary skill in the art at the time of the '747 patent could have combined the energy efficient LED light tube disclosed by Hunter with the ability to retrofit a light tube into an existing light fixture disclosed by Timmermans, and retrofit the resultant light tube into a light fixture with a ballast cover as disclosed in Kanarek to arrive at the "energy-efficient lighting apparatus for retrofit with an existing light fixture having a ballast cover" claimed in claim 12 of the '747 patent. Bretschneider Decl. ¶ 132 (Ex. 1003).

One of ordinary skill in the art would have been motivated to combine the retrofit LED light tube of Timmermans with the configuration of the housing enclosing a circuit board with attached LEDs configuration of Hunter, because both Timmermans and Hunter are in the same field (light tubes) that deal with the same problem (creating an energy-efficient light tube) in the same manner (using light

emitting diodes inside the light tube). Hunter 1:4-7, 2:27-40, 4:35-38 (Ex. 1007); Timmermans 1:11-48 (Ex. 1009); Bretschneider Decl. ¶ 133 (Ex. 1003).

Additionally, one of ordinary skill in the art would have been motivated to combine Hunter with Timmermans by improving the lighting apparatus disclosed in Timmermans in the same way as the technique described in Hunter. Specifically, a person of ordinary skill in the art at the time of the '747 patent would have understood that Hunter discloses a known improvement to LED-on-circuit-board designs, described as including a reflective surface on the upper face of the circuit board to result in more light being directed in a desired direction. Hunter 4:40-42 (Ex. 1007). One of ordinary skill in the art would have understood that Timmermans, which makes use of a an LED-on-circuit-board device, could implement the improvement of Hunter in the same manner by applying a reflective surface to the upper face of the circuit board. Bretschneider Decl. ¶ 134 (Ex. 1003). This improvement would have resulted in the predictable result described in Hunter, that more light would be directed in the desired direction by the Timmermans device. *Id*.

Further, one of ordinary skill in the art would have been motivated to combine Timmermans and Kanarek by improving the lighting apparatus disclosed in Kanarek in the same way as the technique described in Timmermans. Specifically, a person of ordinary skill in the art at the time of the '747 patent would

have understood that Timmermans discloses a known improvement: improving the energy efficiency of a lighting apparatus by replacing a fluorescent light tube with an LED light tube that fits in the same fluorescent light tube socket. Timmermans 1:16-38 (Ex. 1009); Bretschneider Decl. ¶ 135 (Ex. 1003). Kanarek describes a lighting apparatus with a fluorescent light tube mounted in a fluorescent light tube socket. Kanarek 8:36-46 (Ex. 1008). One of ordinary skill in the art would have understood that Kanarek could implement the improvement of Timmermans in the same manner by replacing the fluorescent light tube described in Kanarek with the LED light tube of Timmermans. This improvement would have yielded the predictable result described in Timmermans, that the Kanarek lighting apparatus would be more energy efficient. Bretschneider Decl. ¶ 135 (Ex. 1003).

Further, one of ordinary skill in the art would have been motivated to combine Hunter, Timmermans and Kanarek by improving the lighting apparatus disclosed in Kanarek in the same way as the technique described in Timmermans, and further improving this combination in the same way as the technique described in Hunter. Bretschneider Decl. ¶ 136 (Ex. 1003). As described above, Kanarek could implement the improvement of Timmermans by replacing the fluorescent light tube described in Kanarek with the LED light tube of Timmermans, predictably resulting in a more energy efficient lighting source. Bretschneider Decl. ¶ 136 (Ex. 1003). One of ordinary skill in the art would have further been motivated

to improve the resultant energy efficient lighting source by applying the improvement described in Hunter of adding a reflective coating on the circuit board, predictably resulting in more light from the lighting apparatus going in the desired direction. Bretschneider Decl. ¶ 136 (Ex. 1003). The predictable result of applying the improvements disclosed in Hunter and Timmermans to the device disclosed in Kanarek is a more energy efficient lighting source with more light from the lighting apparatus going in the desired direction. Bretschneider Decl. ¶ 137 (Ex. 1003).

(b) a housing having an attachment surface and an illumination surface;

Hunter discloses a housing having an attachment surface and an illumination surface, which is the combination of the reflective layer on top of the printed circuit board 22 (the illumination surface) and the tube 20 (the attachment surface). Hunter 4:35-42, 5:30-59 (Ex. 1007); Bretschneider Decl. ¶¶ 139-141 (Ex. 1003). The Patent Owner has taken the position in an unrelated district court litigation on the '747 patent that "housing" should be construed as "portion of lighting apparatus that covers or protects other components. Joint Claim Construction Brief at 9 (Ex. 1011). The Patent Owner has further taken the position in an unrelated district court litigation concerning the '747 patent that the "illumination surface" should be construed as "layer of the housing covering the circuit board and which assists in

lighting," and further argued that the "illumination surface" may be a layer of paint. Joint Claim Construction Brief at 18, 43 (Ex. 1011).

The reflective layer of Hunter is described as being a layer on top of the printed circuit board 22 and thus covers the circuit board, another component. Hunter 4:38-42 (Ex. 1007); Bretschneider Decl. ¶ 140 (Ex. 1003). The circuit board 22 of Hunter is also described as being disposed within the tube 20, and thus the tube 20 also covers the circuit board. Hunter 4:35-42, 5:30-59 (Ex. 1007); Bretschneider Decl. ¶ 140 (Ex. 1003). Therefore, the combination of the reflective layer of Hunter and the tube 20 of Hunter together are a "portion of lighting apparatus that covers or protects other components" and meet the Patent Owner's construction of "housing." Bretschneider Decl. ¶¶ 139-140 (Ex. 1003). Accordingly, the reflective layer of Hunter is an illumination surface under Patent Owner's construction of "illumination surface" because it covers the circuit board and assists in lighting. Hunter 4:38-42 (Ex. 1007); Bretschneider Decl. ¶¶ 139-140 (Ex. 1003).

(c) a plurality of illumination surface holes in the illumination surface;

Hunter discloses "a plurality of illumination surface holes in the illumination surface," which are the holes 34 in the circuit board 22. Hunter 4:67-5:3 (Ex. 1007). As described above, the illumination surface is the top reflective layer of the circuit

board, and the holes 34 are described and shown as going all the way through the circuit board, which includes the top layer. Hunter Fig. 11 (22), Fig. 13 (22, 34), Fig. 14 (22, 34), 4:67-5:3 (Ex. 1007); Bretschneider Decl. ¶¶ 142-143 (Ex. 1003).

(d) a circuit board comprising a plurality of light-emitting diodes,

Hunter discloses "a circuit board comprising a plurality of light-emitting diodes" which is the circuit board 22 and the plurality of light emitting diodes 44 that are disposed at the center of the top of the circuit board 22. Hunter 4:64-5:15 (Ex. 1007); Bretschneider Decl. ¶¶ 144-145 (Ex. 1003).

(e) wherein the circuit board is positioned adjacent the housing so that the plurality of light-emitting diodes protrude through the plurality of illumination surface holes in the illumination surface;

Hunter discloses that "the circuit board is positioned adjacent the housing so that the plurality of light-emitting diodes protrude through the plurality of illumination surface holes in the illumination surface" in that the reflective surface comprising the top layer of circuit board 22 (the "illumination surface"), and the LEDs, each including an anode 46 and a cathode 48 (the "plurality of light emitting diodes"), are described as penetrating the holes 34 (the "illumination surface holes in the illumination surface") all the way through the circuit board to traces 32 on the bottom 26 of the circuit board ("protruding through"). Hunter Fig. 1 (22, 44, 46, 48), Fig. 13 (22, 34), Fig. 14 (26, 32, 34) 4:35-42, 4:64-5:9 (Ex. 1007);

Bretschneider Decl. ¶¶ 146-147 (Ex. 1003). Because the LEDs protrude through the entire circuit board, they "protrude through" the top layer of the surface board—the illumination surface.

(f) a fastening mechanism for securing the attachment surface of the lighting apparatus to the illumination surface,

Hunter discloses "a fastening mechanism for securing the attachment surface of the lighting apparatus to the illumination surface" which is the pair of end caps 50 that are described as captivating the printed circuit board 22 (the reflective surface of which is the "illumination surface") within the tube 20 (the "attachment surface of the lighting apparatus"), and the associated gasket 58. Hunter Fig. 1 (20, 22, 50), Fig. 5 (50), Fig. 11 (20, 22, 50), Fig. 12 (20, 22, 50), 5:30-59 (Ex. 1007); Bretschneider Decl. ¶¶ 148-149 (Ex. 1003). The gasket 58 is disposed between the end cap 50 and the printed circuit board 22 in order to hold the printed circuit board 22 captive within the hollow tube ("securing the attachment surface of the lighting apparatus to the illumination surface"). Hunter Fig. 7 (58), Fig. 5 (50), Fig. 8 (58), 5:47-59 (Ex. 1007); Bretschneider Decl. ¶ 148 (Ex. 1003). Thus the combination of the end caps 50 and the gasket 58 (together "the fastening mechanism") are used to secure the tube 20 (the "attachment surface of the lighting apparatus") to circuit board 22, including the reflective layer (the "illumination surface").

(g) wherein the lighting apparatus is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch.

This limitation is obvious in either a combination of Hunter with Kanarek (which Petitioners assert if the preamble of claim 12 is determined by the Board to not be limiting) or in a combination of Hunter with Kanarek and Timmermans (which petitioners assert if the preamble of claim 12 is determined by the Board to be limiting).

Kanarek discloses that a "lighting apparatus is coupled to a wall switch and wherein the illumination of the light-emitting diodes is controllable based upon the position of the wall switch," which is the wall switch 152 that is connected to illumination modules 52 (the "lighting apparatus"). Kanarek Fig. 13 (52, 152), 10:49-68 (Ex. 1008); Bretschneider Decl. ¶ 150 (Ex. 1003). This light switch controls the lighting system by implementing a push on, push off, or "rocker" design, which a person of ordinary skill in the art would understand to be a wall switch that is "on" when the top portion is pushed, and is "off" when the bottom portion is pushed. Bretschneider Decl. ¶ 150 (Ex. 1003). For example, the below figure is an example of a push on, push off, or "rocker" design for a wall switch of the type that would have been known to a person of ordinary skill in the art. Bretschneider Decl. ¶ 150 (Ex. 1003). Thus, the wall switch disclosed in Kanarek is

a wall switch which turns the lighting apparatus on or off depending on the position of the push on, push off, or "rocker" design of the wall switch. Bretschneider Decl. ¶ 150 (Ex. 1003).

A person of ordinary skill in the art would have been motivated to combine the teachings of the lighting apparatus of Hunter with the teachings of the wall switch of Kanarek. Kanarek teaches that, since at least 1960, lighting devices have been controlled by wall switches by means of coupling a wall switch to a power outlet in a room and plugging a lighting device into the power outlet. Kanarek 1:29-42, 14:16-19 (Ex. 1008); Bretschneider Decl. ¶ 151 (Ex. 1003). Hunter describes plugging the lighting apparatus into an electrical outlet in a wall. Hunter Fig. 7 (58), Fig. 5 (50), Fig. 8 (58), 6:51-65 (Ex. 1007); Bretschneider Decl. ¶ 151 (Ex. 1003). Thus a person of ordinary skill in the art at the time of the alleged inventions of the '747 patent would have understood that the use of a wall switch coupled to an

electric socket and a lighting apparatus plugged into the electric socket would have yielded the predictable result that the lighting apparatus would be coupled to the wall switch in a way that controlled whether the lighting apparatus was on or off based on the position of the wall switch. Bretschneider Decl. ¶ 151 (Ex. 1003).

Additionally, one of ordinary skill in the art would have been motivated to combine Hunter with Kanarek because he would have understood that one improvement taught by Kanarek, adding an on/off wall switch to the power cord of the lighting apparatus, would improve other lighting devices having power cords such as Hunter in the same way and thus it would have been obvious to do so. Bretschneider Decl. ¶ 152 (Ex. 1003). Kanarek teaches an improvement over wall switches coupled to electric sockets, which is a push-on, push off, or "rocker" switch that may be installed on a power cable to provide a controllable connection to an unswitched power outlet. Kanarek Fig. 13 (152), 4:10-13, 14:1-15 (Ex. 1008); Bretschneider Decl. ¶ 152 (Ex. 1003). Kanarek also teaches that this wall switch can be installed anywhere along the power cable to provide on-off control for a lighting apparatus plugged into the associated power outlet. Kanarek Fig. 13 (116), 14:9-11 (Ex. 1008); Bretschneider Decl. ¶ 152 (Ex. 1003). It would have been obvious to one of ordinary skill in the art to implement this improvement from Kanarek in the lighting apparatus taught by Hunter, which also includes a lighting apparatus with a power cord and the electric cable 60 attached to the electronics of

the lighting apparatus through end cap 50. Hunter Fig. 1 (50, 60), Fig. 11 (50, 60), Fig. 12 (50, 60), 5:60-6:1; Bretschneider Decl. ¶ 152 (Ex. 1003).

As described above, one of ordinary skill in the art would have been motivated to combine Timmermans and Kanarek by replacing the fluorescent tube of Kanarek with an LED tube as described in Timmermans. This combination is unrelated to the power cord descriptions in Kanarek. Bretschneider Decl. ¶¶ 153-155 (Ex. 1003). Thus, one of ordinary skill in the art would have been motivated to combine Hunter with Kanarek as improved by Timmermans for all of the same reasons that one of ordinary skill in the art would have been motivated to combine Hunter with Kanarek. Bretschneider Decl. ¶¶ 153-155 (Ex. 1003).

VIII. CONCLUSION

Based on the foregoing, claims 1 and 12 of the '747 patent recite subject matter that is unpatentable. The Petitioners request institution of an *inter partes* review to cancel these claims.

Date: February 27, 2017

Respectfully submitted,

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Appendix of Exhibits

Exhibit	Description
Ex. 1001	U.S. Patent No. 7,086,747 to Nielson, et al.
Ex. 1002	File History of U.S. Patent No. 7,086,747
Ex. 1003	Declaration of Eric Bretschneider, Ph.D.
Ex. 1004	U.S. Patent No. 5,410,453 to Ruskouski
Ex. 1005	U.S. Patent No. 4,323,820 to Teich
Ex. 1006	U.S. Patent No. 7,204,602 to Archer
Ex. 1007	U.S. Patent No. 6,283,612 to Hunter
Ex. 1008	U.S. Patent No. 5,226,724 to Kanarek
Ex. 1009	U.S. Patent No. 7,049,761 to Timmermans, *et al*.
Ex. 1010	*Curriculum Vitae* of Eric Bretschneider, Ph.D.
Ex. 1011	*Blackbird v. ELB Electronics et al.*, Joint Clam Construction Brief
Ex. 1012	*Blackbird v. ELB Electronics et al.*, Claim Construction Order
Ex. 1013	U.S. Patent No. 6,184,628 to Ruthenberg

CERTIFICATE OF WORD COUNT

The undersigned certifies that the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 7,086,747 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.1-.80, 42.100-.123 complies with the type-volume limitation in 37 C.F.R. § 42.24(a)(1)(i). According to the "Word Count" feature of the word-processing system to create this Petition, the Petition contains 13,294 words, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(a)(1).

Dated: February 27, 2017

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CERTIFICATE OF SERVICE ON PATENT OWNER UNDER 37 C.F.R. §§ 42.6(e) and 42.105

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105, the undersigned certifies that on February 27, 2017, a complete and entire copy of this Petition for *Inter Partes* Review of U.S. Patent 7,086,747 was served via EXPRESS MAIL®, postage prepaid, to the Patent Owner by serving the following parties:

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