

Petition for IPR of U.S. Patent No. 9,049,759
Case No. IPR2023-01258

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADVANCED LIGHTING CONCEPTS LLC,
Petitioner

v.

MATE LLC.,
Patent Owner

Case No. IPR2023-01258

U.S. Patent No. 9,049,759

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,049,759

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PETITIONER'S EXHIBIT LIST

<u>EXHIBIT</u>	<u>DESCRIPTION</u>
Ex. 1001	U.S. Patent No. 9,049,759
Ex. 1002	Declaration of Joseph McAlexander
Ex. 1003	Curriculum Vitae of Joseph McAlexander
Ex. 1004	File Wrapper for U.S. Patent No. 9,049,759
Ex. 1005	U.S. Patent No. 7,902,769 to Shteynberg
Ex. 1006	U.S. Patent Application No. US20120007512A1 to Kim
Ex. 1007	U.S. Patent Application No. US20060022214A1 to Morgan
Ex. 1008	March 22, 2023 Case Management Order (Dkt. 35)
Ex. 1009	Time to Trial for the Southern District of California
Ex. 1010	What Is an LED Driver & Which Driver Do I Need?, ULTRA LEDS, https://www.ultraleds.co.uk/what-is-led-driver-what-driver-do-i-need
Ex. 1011	Yijie Wang, et al., <i>A Review of LED Drivers and Related Technologies</i> , 64 IEEE Transactions on Indus. Electronics 5754, 5754 (July 2017)

I. INTRODUCTION

Petitioner requests *Inter Partes* Review (“IPR”) of claims 1, 5, 6, 9, 13, 15-17, 19, 20 and 24 (the “Challenged Claims”) of U.S. Patent No. 9,049,759 (“the ‘759 Patent”).

This petition (IPR2023-01258) is part of a set of **six** petitions, including IPR2023-01257, IPR2023-01264, IPR2023-01266, IPR2023-01265 and IPR2023-01259, which challenge claims of U.S. Patent Nos. 8,525,446 (“the ‘446 “Patent”); 8,957,601 (“the ‘601 Patent”); 9,049,759 (“the ‘759 Patent”); 9,078,310 (“the ‘310 Patent”); 9,320,093 (“the ‘093 Patent”); and 9,597,713 (“the ‘713 Patent”) (collectively, the “Challenged Patents”), respectively. Petitioner requests that the USPTO combine the schedule, discovery, and hearing of these six IPRs.

II. MANDATORY NOTICES

A. Real Parties-in-Interest (37 C.F.R. § 42.8(b)(1))

The sole real party-in-interest is Advanced Lighting Concepts, LLC, (“Petitioner”).

B. Related Matters (37 C.F.R. § 42.8(b)(2))

The ‘759 Patent is related to a district court litigation pending in the Southern District of California. mate, LLC (“Patent Owner”) asserted the ‘446 Patent, ‘601 Patent, ‘759 Patent, ‘310 Patent, ‘093 Patent, and ‘713 Patent against Petitioner in:

mate, LLC v. Advanced Lighting Concepts LLC (d/b/a Environmental Lights), 3:22-cv-01095-CAB-DEB (S.D. Cal.).

C. Counsel (37 C.F.R. § 42.8(b)(3)) and Service Information (37 C.F.R. § 42.8(b)(3)-(4))

Petitioner designates Winston O. Huff (Reg. No. 51,825) as lead counsel for this matter and designates Jamil N. Alibhai (*pro hac vice* forthcoming) as backup counsel for this matter.

Postal mailings and hand-deliveries for lead and backup counsel should be addressed to: Winston O. Huff, Munsch Hardt Kopf & Harr, 500 N. Akard, Suite 3800, Dallas, TX 75201 (Telephone: 214.855.7500; Fax: 214.855.7584).

Pursuant to 37 C.F.R. § 42.8(b)(4), Petitioner consents to e-mail service at: EL-mate-IPRs@munsch.com. In compliance with 37 C.F.R. § 42.10(b), a Power of Attorney is also filed concurrently herewith.

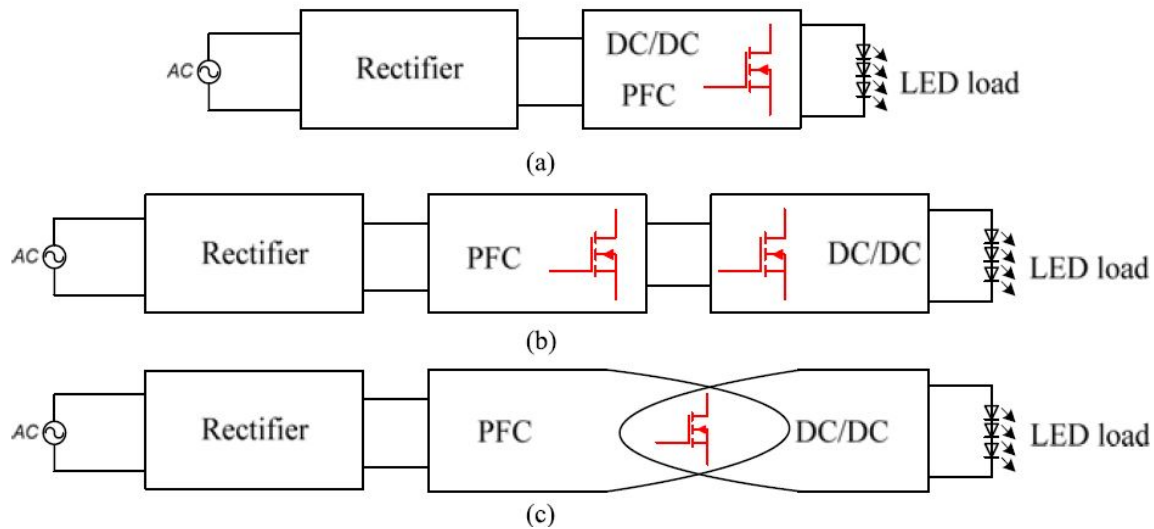
III. CERTIFICATION AND FEES

Petitioner certifies that the ‘759 Patent is available for IPR and that the Petitioner is not barred or estopped from requesting *inter partes* review of claims 1, 5, 6, 9, 13, 15-17, 19, 20 and 24 of the ‘759 Patent identified in this Petition.

Any additional fees for this IPR may be charged to Deposit Account No. DA505990.

IV. TECHNOLOGY AT ISSUE

The Challenged Patents relate to LED drivers. “LED drivers are devices that regulate and supply the power used to ‘drive’ runs of LED strip lights. Similar to traditional transformers, they convert mains voltage (240v AC) into a lower value (usually 12 or 24v).” *What Is an LED Driver & Which Driver Do I Need?*, ULTRA LEDs, <https://www.ultraleds.co.uk/what-is-led-driver-what-driver-do-i-need> (last visited July 29, 2023) (Ex. 1010). “Generally speaking, the driver circuit plays a significant role in dominating the energy efficiency, which means the system efficiency can be further improved via an appropriate driver circuit. Traditional LED systems are based on single-stage or two-stage LED drivers.” Yijie Wang, et al., *A Review of LED Drivers and Related Technologies*, 64 IEEE TRANSACTIONS ON INDUS. ELECTRONICS 5754, 5754 (July 2017) (Ex. 1011). A single-stage LED driver is a DC/DC converter with constant output current that can obtain power factor (PF) correction (PFC), while a two-stage system consists of a PFC circuit and a DC/DC converter as shown below. *Id.*



Id. at 5756 fig. 3.

[D]ue to the unique characteristics of LEDs, a current loop is always included in the [DC/DC stage] in order to acquire constant current control. Moreover, in practical applications when several strings of LEDs are adopted, a current balance stage may also be required. The advantage of the above two LED drivers is that they are easy to design with more accurate control. However, one of the drawbacks of single stage converters is the high value of the storage capacitor, which also increases the volume of the driver. As for the two-stage system, more devices are needed, which means the cost is quite high and reliability is relatively low.

Id. at 5754-55.

“In recent years, many integrated-stage topologies are designed for the sake of efficiency and cost.” *Id.* at 5755. “In order to obtain high PF and low total harmonic distortion (THD), a topology which performs PFC characteristics as PFC

stage is usually chosen, and a [DC/DC] stage is selected according to the power level of the system.” *Id.* Due to the integration technology, the PFC stage and DC/DC stage can be simplified into one stage by sharing active power switches and control circuit. Therefore, cost and size of the system is reduced while ensuring high efficiency, high reliability, and fast output dynamics. *Id.*

V. OVERVIEW OF THE ‘759 PATENT

The ‘759 Patent describes a configurable light emitting diode (LED) driver/dimmer for controlling a set of light fixture loads. Ex. 1001, Abstract. The ‘759 Patent purports to address the considerable challenges faced by lighting companies in adopting SSL technology due to their unfamiliarity and lack of expertise in the driving and dimming requirements for LEDs. Ex. 1001, 1:36-39.

The ‘759 Patent further notes that

[w]ith the rapid increase in [LED] efficacies for high powered LEDs, the latest technologies have exceeded incandescent and halogen sources and are now starting to compete with fluorescent, mercury vapour, metal halide, and sodium lighting. In addition to better energy usage, LEDs also have considerable advantages over traditional light sources such as long life, better durability, and improved color generating abilities.

Ex. 1001, 1:20-24.

“In recent years, controllable power sources for Solid State Lighting (SSL) applications have entered the market with integrated features. In addition, digital controllers within power sources have enabled the development of configurable options to provide a wider flexibility of solutions for [SSL] applications.” Ex. 1001, 1:31-36. Finally, the ‘759 Patent states “[t]he ability to dim the light output of LEDs is also important to reduce energy consumption.” Ex. 1001, 1:36-37.

VI. THE ALLEGED INVENTION

The claims of the ‘759 Patent are generally directed to a configurable LED driver for powering a set of light fixture loads. The LED driver of the ‘759 Patent includes:

a power circuit which includes an inrush current limit and a DC/DC convertor, a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter, a regulated output voltage bus connected to the DC/DC converter, and a primary digital controller for controlling the power circuit. The driver further includes a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load. The driver also includes an apparatus for configuring the set of output current drivers to an output current set point and at least one power limit connected to the regulated output voltage bus.

Ex. 1001, Abstract.

A. Summary of Prosecution History

The application that issued as the '759 Patent (US13/941,871) was filed on July 15, 2013 and is a continuation of U.S. patent application Ser. No. 13/059,336, filed March 22, 2011, which is a national stage filing under 35 U.S.C. § 371 of International Patent Application PCT/CA2009/001295, filed on September 17, 2009, which claims the benefit of priority of U.S. Provisional Application No. 61/097,963, filed September 18, 2008.

In a first Office Action, all of the filed claims were rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent 8,525,446. Although the claims at issue are not identical, they are not patentably distinct from each other because, regarding independent claims 1 and 20, they contain substantially similar subject matter, including:

a power circuit including: an inrush current limit; a DC/DC converter; a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter; a regulated output voltage bus connected to the DC/DC converter; a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load; and an apparatus for configuring the set of output current drivers to an output current set point.

Ex. 1001, 10:42-55; *see id.* 12:4-17.

In response, the Applicant amended the Abstract to note that the LED driver includes an apparatus for configuring the set of output current drivers to an output current set point and at least one power limit connected to the regular output voltage bus. Ex. 1001, Abstract. The Applicant filed a terminal disclaimer limiting the term of the '601 Patent to that of the '446 Patent. Ex. 1004, Prosecution History.

In the Notice of Allowance, the Examiner noted that claims were allowable over the prior art because it

does not disclose a configurable light emitting diode (LED) driver for powering a set of light fixture loads comprising: a power circuit including: an inrush current limit; a DC/DC converter; a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter; a regulated output voltage bus connected to the DC/DC converter; a primary controller for controlling the power circuit; a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load, and; an apparatus for configuring the set of output current drivers to an output current set point.

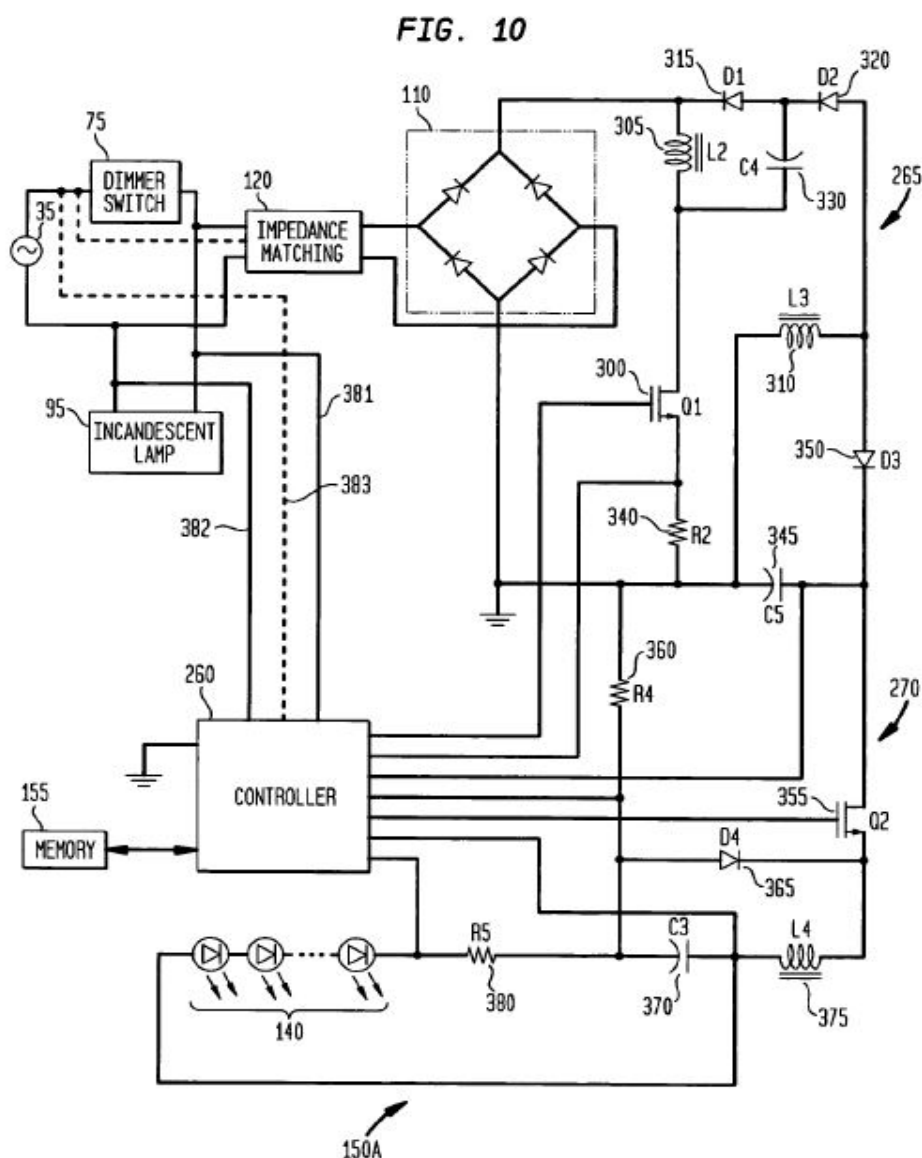
Ex. 1004 at 39-40. As discussed below, each of the purportedly inventive elements was known in the prior art at least since 2006.

VII. OVERVIEW OF THE PRIOR ART

The challenged claims are anticipated by or are obvious over the following prior art.

A. Shteynberg (Ex. 1005)

U.S. Patent No. 7,902,769 (“Shteynberg”) was filed on January 19, 2007, and claims priority to provisional application No. 60/760,157 filed on January 20, 2006. Shteynberg issued on March 8, 2011 and is prior art to the ‘446 Patent under pre-AIA § 102(a). Shteynberg teaches a system, apparatus, and method for supplying power to solid state lighting devices, such as for providing power to light emitting diodes (“LEDs”) and LEDs integrated with digital controllers or processors. Ex. 1005, 1:19-22, fig. 7, 8, and 10.



Ex. 1005, fig. 10.

As illustrated in Figure 10 of Shteynberg,

the switching power supply 150A is coupled via impedance matching circuit 120 to a phase modulation module/dimmer, such as a dimmer switch 75, and is intended to operate in the second mode of operation mentioned above. The switching power supply 150A is implemented in

two stages, an AC/DC converter 265 and a buck converter 270. The AC/DC converter 265 is utilized to provide a high input impedance, thereby eliminating the high input capacitance that the single stage approaches have (and which can cause triacs of dimmers to misfire, as previously mentioned). This first stage will convert a relatively poor, phased modulated AC voltage into a manageable DC voltage, while the second stage (buck converter 270) will perform LED driving using current PWM, through switching transistor 355 (Q2).

The quadratic AC/DC converter 265 portion of switching power supply 150A is connected to the dimmer switch 75 via an impedance matching circuit 120. The AC/DC converter 265 comprises major elements such as switch Q1 (300), inductors L2 (305) and L3 (310), capacitors C4 (330) and C5 (345), diodes D1 (315) and D2 (320), and current sense resistor R2 (340). Buck converter 270 portion of switching power supply 150A generally comprises a switching transistor Q2 (355) (for dimming), inductor L4 (375), capacitor C3 (370), and current sense resistor R4 (360). The switching power supply 150A also comprises controller 260, which provides the functionality of the controller 160 previously discussed, and the additional functionality discussed below.

Ex. 1005, 13:61-14:21.

As examined above,

the controller 260 may determine V_{RMS} using measurements from connections to the output of dimmer switch 75 on lines 381 and 382; may determine $V_{NOMINAL}$ using measurements from connections to the

output of dimmer switch 75 on lines 381 and 382, using measurements from connections to the AC line voltage 35 on lines 382 and 383 (dashed line), or using stored parameter values. The controller 260 correspondingly adjusts the duty cycle of the pulse-width modulation of current provided to the LEDs 140 through switching transistor 355 (Q2).

Ex. 1005, 14:22-31.

Importantly, Shteynberg discloses:

[A] “controller” or “processor” 160, 260 may be any type of controller or processor, and may be embodied as one or more controllers 160, 260, adapted to perform the functionality discussed in the ‘759 Patent specifically Shteynberg discloses that a controller 160, 260 may include use of a single integrated circuit (“IC”), or may include use of a plurality of integrated circuits or other components connected, arranged or grouped together, such as controllers, microprocessors, digital signal processors (“DSPs”), parallel processors, multiple core processors, custom ICs, application specific integrated circuits (“ASICs”), field programmable gate arrays (“FPGAs”), adaptive computing ICs, associated memory (such as RAM, DRAM and ROM), and other ICs and components. As a consequence, as used herein, the term controller (or processor) should be understood to equivalently mean and include a single IC, or arrangement of custom ICs, ASICs, processors, microprocessors, controllers, FPGAs, adaptive computing ICs, or some other grouping of integrated circuits which perform the functions discussed below, with associated memory, such as microprocessor

memory or additional RAM, DRAM, SDRAM, SRAM, MRAM, ROM, FLASH, EPROM or E²PROM.

...

Equivalently, when the controller 160, 260 may implemented in whole or part as FPGAs, custom ICs and/or ASICs, the FPGAs, custom ICs or ASICs also may be designed, configured and/or hard-wired to implement the methodology of the invention. For example, the controller 160, 260 may be implemented as an arrangement of controllers, microprocessors, DSPs and/or ASICs, collectively referred to as a “controller”, which are respectively programmed, designed, adapted or configured to implement the methodology of the invention, in conjunction with a memory 155.

Ex. 1005, 18:8-29, 39-49.

B. Kim (Ex. 1006)

U.S. Patent Application No. US20120007512 (“Kim”) was filed on July 12, 2011, and was published on January 12, 2012. Kim is prior art to the ‘759 Patent under AIA § 102(b). Kim teaches a power supply device and, more particularly, a power supply device for driving a light emitting diode (LED) capable of controlling the switching of multiple output powers, in synchronization with the frequency of one of the multiple output powers and simplifying a power conversion stage in supplying power for driving an LED. Ex. 1006, 1[0003].

C. Morgan (Ex. 1007)

U.S. Patent Application No. US20060022214 (“Morgan”) was filed on July 8, 2005 and claims priority to Ser. No. 60/586,939, filed July 8, 2004, entitled “Integrated LED Systems and Methods”; and to Ser. No. 60/588,090, filed July 15, 2004, entitled “LED Package Methods and Systems.” Morgan was published on February 2, 2006. Morgan is prior art to the ‘759 Patent under pre-AIA § 102(b).

Morgan teaches a

method for providing a light source including providing at least one LED in an LED die, and packaging the LED die with a submount, wherein the submount incorporates an electronic component for controlling the LED, wherein the electronic component facilitates control of at least one of the intensity and the apparent intensity of the LED die.

Ex. 1007, 1[0014].

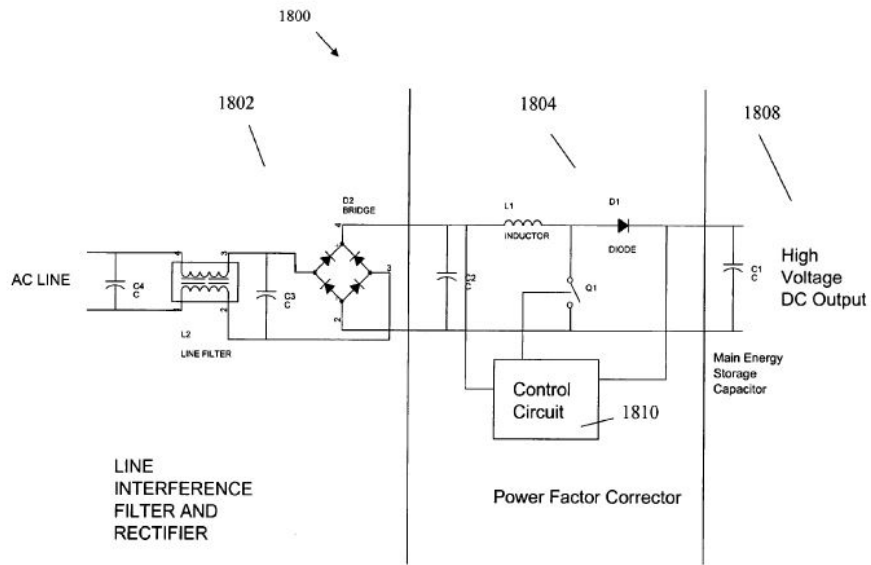


Fig. 15

Ex. 1007, fig. 15.

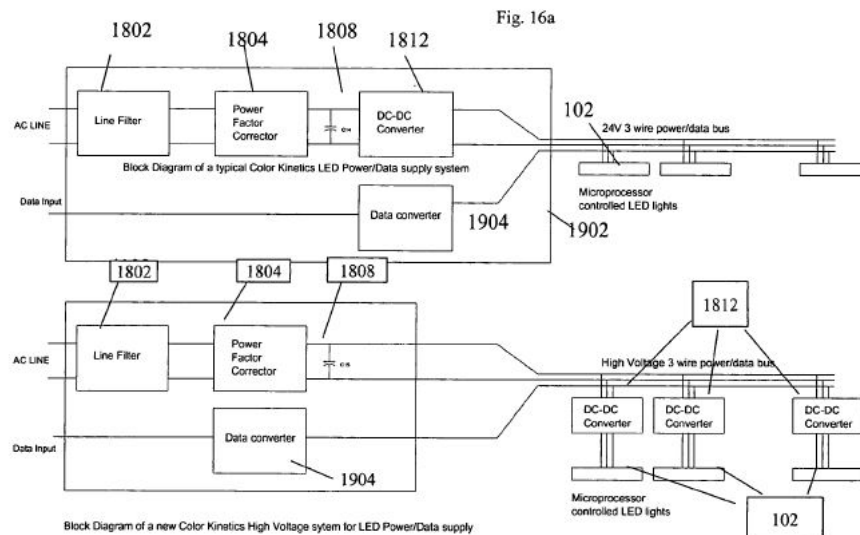


Fig. 16b

Ex. 1007, fig. 16b.

VIII. CLAIM CONSTRUCTION

“In an *inter partes* review proceeding, a claim of a patent . . . shall be construed using the same claim construction standard that would be used to construe the claim in a civil action . . . , including construing the claim in accordance with the ordinary and customary meaning of such claim as is understood by” a person of ordinary skill in the art (“POSITA”). 37 C.F.R. § 42.100(b). Each claim term challenged by this Petition should be construed in accordance with its ordinary and customary meaning for purposes of resolving the issues raised in this Petition.

IX. GROUNDS FOR PETITION

A. Ground 1: Shteynberg Anticipates Claims 1, 6, 13, 19-20

Independent claims 1 and 20 and dependent claims 3, 6, and 19 of the ‘759 patent are anticipated by Shteynberg under 35 U.S.C. § 102.

1. Claim 1

a. 1[p] - A configurable light emitting diode (LED) driver for powering a set of light fixture loads comprising:

To the extent that the Board finds that the preamble is limiting, Shteynberg discloses “[i]n accordance with the present invention, therefore, an LED driver circuit is provided which is compatible for operation with the existing lighting infrastructure, such as dimmer switches, and may be coupled directly to and controlled by such dimmer switches.” Ex. 1005, 8:9-13. Shteynberg, thus, discloses a configurable LED driver/dimmer for powering a set of light fixture loads.

b. 1(a) - a power circuit including: an inrush current limit; a DC/DC converter:

Shteynberg discloses a power circuit of the '759 Patent. For example, claim 28 of Shteynberg discloses “[a] power converter for providing variable brightness levels for solid state lighting, the power converter couplable to a phase-modulating switch which is couplable to an AC line voltage.” Ex. 1005, 22:26-29. A power circuit generally is any circuit used to carry electricity that operates a load. Ex. 1002 ¶ 55. As demonstrated by the above excerpt, the power converter carries electricity from the AC line voltage to provide variable brightness levels for solid state lighting. As such, a POSITA would readily understand that the power converter of Shteynberg is analogous to the power circuit of the '759 Patent. *Id.*

Further, Shteynberg discloses the inrush current limit of the '759 Patent. For example, Shteynberg, when discussing FIG. 5, discloses:

For example, as illustrated in FIG. 5, a switching off-line LED driver 90 typically includes a full wave rectifier 20 with a capacitive filter 15, which allows current to flow to the filter capacitor (C) 15, when the input Voltage is greater than the Voltage across the capacitor. The inrush current to the capacitor is limited by the resistance in series with the capacitor. Under normal operating conditions, there may be a Negative Temperature Coefficient resistor (NTC) or thermistor in series with the capacitor to minimize inrush current during initial charging.

Ex. 1005, 3:42-51.

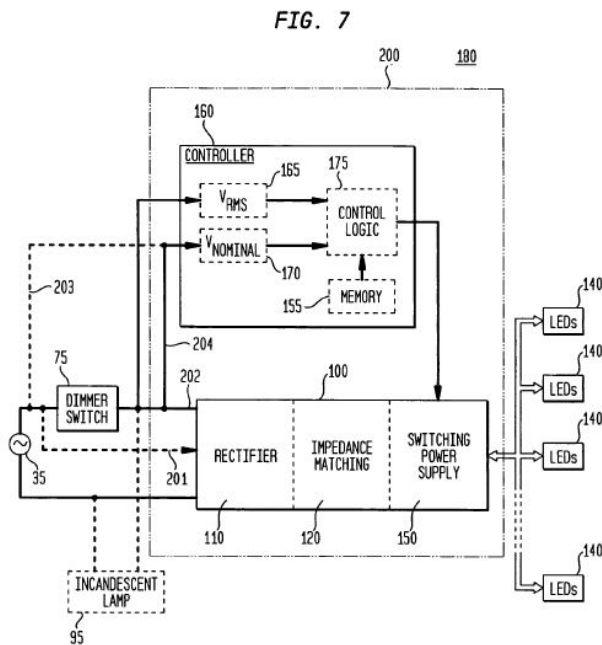
A POSITA would readily understand that using a resistor in series with a capacitor to limit inrush current as described in Shteynberg is analogous to the inrush current limit of the '759 Patent. Ex. 1002 ¶ 56. Therefore, Shteynberg discloses an inrush current limit. *Id.* Still further, Shteynberg discloses that “[t]he switching power supply 150A is implemented in two stages, an AC/DC converter 265 and a buck converter 270.” Ex. 1005, 13:65-67. Therefore, Shteynberg discloses a power circuit including an inrush current limit and DC/DC converter.

c. 1(b) - a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter

Shteynberg discloses the power factor correction (PFC) boosted connected to the inrush current limit and the DC/DC converter of the '759 Patent. As discussed above, Shteynberg discloses a LED driver having an inrush current limit and DC/DC converter. Ex. 1005, 13:65-14:8. Shteynberg further discloses “the current regulator 100 comprises a rectifier 10, an impedance matching circuit 120, and a switching power supply (or driver) 130.” Ex. 1005, 8:65-67. Shteynberg further discloses:

FIG. 7 is a block diagram of an exemplary second embodiment of a current regulator (or converter) 200 in accordance with the teachings of the present invention. The current regulator 200 comprises a rectifier 110, an impedance matching circuit 120, a switching power supply (or driver) 150, and further includes a controller 160 coupled to receive an output from the dimmer switch 75.

Ex. 1005, 7:29-31.



Ex. 1005, fig. 7.

Shteynberg also discloses the power stage of the converter 100, 200 has a number of features to make it compatible with the phase modulated input voltage. These features include, the “built-in capability to deliver power factor correction without additional power components.” Ex. 1005, 16:50-65.

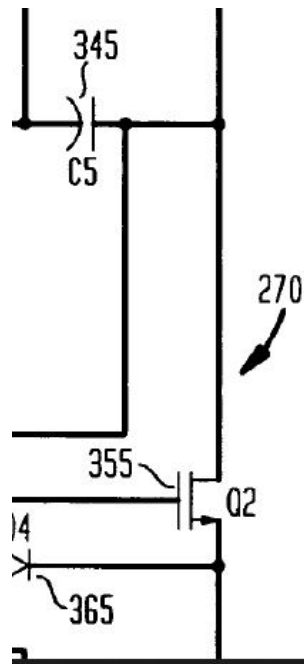
Finally, Shteynberg in discussing Figure 10, discloses:

the second stage of the switching power supply 150, converter 270, however, continues to operate and provide LEDs 140 with a regulated current (i.e., operates continuously, during both Ta and B time intervals). As mentioned above, when capacitor C5 (345) has a sufficient capacitance value, it has sufficient stored energy to continue

to provide PWM current to LEDs 140, with the PWM also controlled by controller 260 through switch Q2 (355)

Ex. 1005, 14:60-15:1.

First, as discussed above, a POSITA would understand that the buck converter 270 is equivalent to the DC/DC converter of the '759 patent. Ex. 1002 ¶ 57; *supra* Section IX.A.1.b. Here, Shteynberg not only discloses a power factor correction boost, it also discloses that the power factor boost is connected (built-in) to the buck (DC/DC) converter and the inrush current limit. Ex. 1005, 16:61-63. Additionally, as discussed above (and as shown in Figure 10), Shteynberg discloses that the inrush current limiter (capacitor 345) is directly connected to the DC/DC converter. Ex. 1005, 14:11-18.



Ex. 1005, fig. 10.

As such, Shteynberg discloses a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter as required by claim 1 of the '759 patent.

d. 1(c) - a regulated output voltage bus connected to the DC/DC converter;

Shteynberg discloses the regulated output voltage bus connected to the apparatus for power factor correction and DC/DC converter of the '759 patent. For example, Shteynberg discloses “[t]he current regulator 200 comprises a rectifier 110, an impedance matching circuit 120, a switching power supply (or driver) 150, and further includes a controller 160 coupled to receive an output from the dimmer switch 75.” Ex. 1005, 9:5-9.

Shteynberg further discloses:

The switching power supply 150A is implemented in two stages, an AC/DC converter 265 and a buck converter 270. . . . This first stage will convert a relatively poor, phased modulated AC voltage into a manageable DC voltage, while the second stage (buck converter 270) will perform LED driving using current PWM, through switching transistor 355 (Q2).

Ex. 1005, 13:65-14:8.

Finally, Shteynberg discloses:

The proposed power stage 265 of the converter 100, 200 has the following features making it compatible with the phase modulated

input voltage: . . . (3) it uses a relatively small, low filtering capacitor for low frequency ripple, or can allow this ripple to be comparatively high (with filtering in the second stage 270), so smaller and/or a non-electrolytic capacitor may be used (such as a film or ceramic capacitor), decreasing costs and extending the life of the driver; [and] (4) it has built-in capability to deliver power factor correction without additional power components.

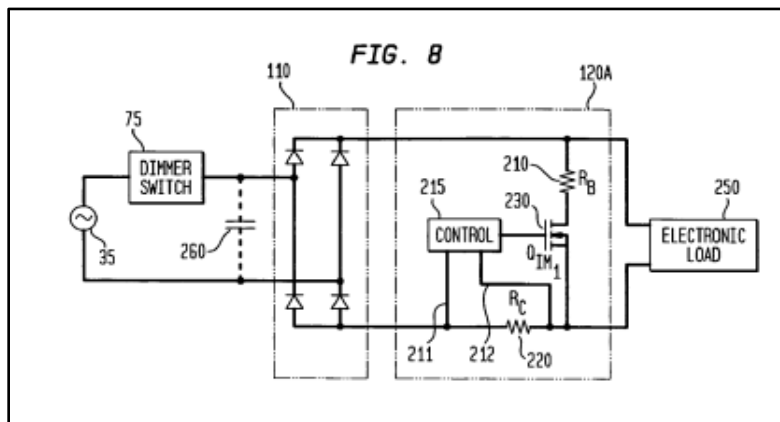
Ex. 1005, 16:50-63,

A POSITA would recognize that the rectifier (110) provides a regulated output voltage connected with impedance matching network (120) and switching power supply (buck converter) (150) would understand that the switching power supply 150 disclosed in Shteynberg is the equivalent of the regulated output voltage bus of the ‘759 Patent. Ex. 1002 ¶ 58. Similarly, as discussed above, a POSITA would understand that the buck converter 270 is equivalent to the DC/DC converter of the ‘759 patent. Ex. 1002 ¶ 57; *supra* Section IX.A.1.b. Further, the switching power supply 150 is connected to the buck converter 270. Ex. 1005, 13:65-67. As such, Shteynberg discloses a regulated output voltage bus connected to the DC/DC converter as required by claim 1 of the ‘759 patent.

e. 1(d) - a primary controller for controlling the power circuit;

Shteynberg discloses the primary controller of the ‘759 patent. Specifically, Shteynberg discloses “the controller 160 (and 260, FIG. 10) is programmed, adapted or configured to emulate the brightness or intensity control provided by the dimmer

switch 75, to control the switching power supply 150 and correspondingly modify the brightness (or intensity) provided by the LEDs 140.” Ex. 1005, 9:13-26. Shteynberg further discloses “the control block 215 (e.g., controller 160, 260) may be coupled (lines 211, 212) to detect or otherwise receive feedback of the voltage across current sense resistor 220.” Ex. 1005, 10:57-59.



Ex. 1005, fig. 8.

A POSITA would understand that the controller disclosed in Shteynberg is equivalent to the primary controller required by the ‘759 patent. Ex. 1002 ¶ 60. As such, Shteynberg discloses the primary controller for controlling the power circuit required by claim 1 of the ‘759 patent.

- f. 1(e) - a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load, and;**

Shteynberg discloses a set of output current drives connected to one of the set of light fixture loads for powering the connected light fixture load. For example, Shteynberg discloses that:

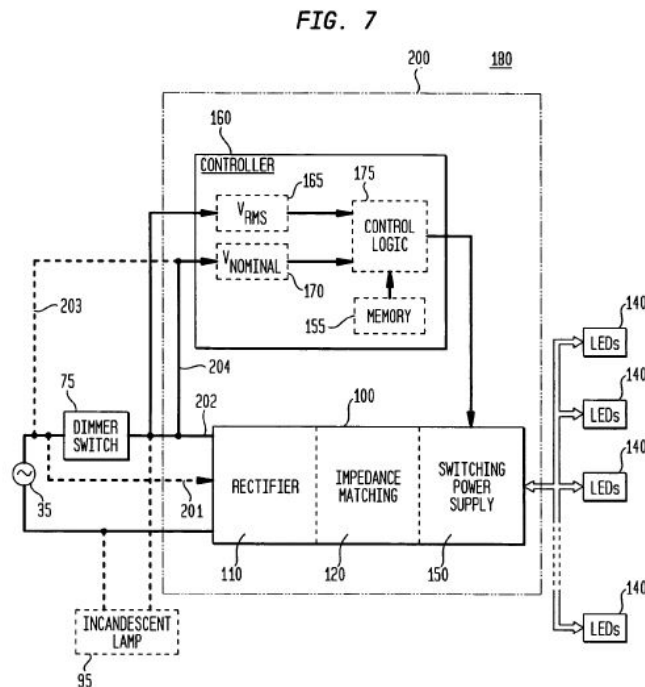
LED driver circuits and LEDs [(i.e., light fixture loads)] will be wired within existing lighting infrastructure, such as replacing an incandescent bulb (placed within an Edison socket) or replacing an incandescent lamp, with wiring to existing switches, such as dimmer switches. In a second phase, existing switching connections may be re-wired, allowing LED driver circuits to be co-located in the same junction or wall box as the switches, but wired directly to the AC line voltage, with existing switching (such as dimmers) generating only a control signal to regulate LED brightness.

Ex. 1005, 8:20-29.

Shteynberg discloses a set of output current drivers for controlling the LED brightness. *Id.* As such, Shteynberg discloses a set of output current drivers connected to one of the set of light fixture loads for powering the connected light fixture load.

g. 1(f) an apparatus for configuring the set of output current drivers to an output current set point

Shteynberg discloses a set of output current drives and light fixture loads. For example, Shteynberg discloses that “LED driver circuits and LEDs [(i.e., light fixture loads)] will be wired within existing lighting infrastructure, such as replacing an incandescent bulb (placed within an Edison socket) or replacing an incandescent lamp, with wiring to existing switches, such as dimmer switches.” Ex. 1005, 8:20-24. Shteynberg, in its discussion of Figure 7, further discloses that “the controller 160 (and 260, FIG. 10) is programmed, adapted or configured to emulate the brightness or intensity control provided by the dimmer switch 75, to control the switching power supply 150 and correspondingly modify the brightness (or intensity) provided by the LEDs 140.” Ex. 1005, 9:21-26.



Ex. 1005, fig. 7.

A POSITA would understand, as discussed above, that the controller 160 or 260 is the apparatus that configures the set of output current drivers (switching power supply 150) to an output current set point. Ex. 1002 ¶ 60; *supra* Section IX.A.1.e. As such, Shteynberg discloses an apparatus for configuring the set of output current drivers to an output current set point.

2. Claim 6

Claim 6 depends from independent claim 1. Shteynberg anticipates claim 1 for the reasons discussed above and incorporated herein. *Supra* Section IX.A.1. Claim 6 discloses a secondary controller. Ex. 1001, 10:56-59. The additional limitation of claim 6 is disclosed by Shteynberg.

For example, Shteynberg discloses that the controller 260 “is programmed, adapted or configured to emulate the brightness or intensity control provided by the dimmer switch 75, to control the switching power supply 150 and correspondingly modify the brightness (or intensity) provided by the LEDs 140.” Ex. 1005, 9:22-26.

Additionally, Shteynberg discloses that:

As the term controller or processor is used herein, a controller 160, 260 may include use of a single integrated circuit (“IC”), or *may include use of a plurality of integrated circuits or other components connected, arranged or grouped together, such as controllers, microprocessors*, digital signal processors (“DSPs”), parallel processors, multiple core processors, custom ICs, application specific integrated circuits (“ASICs”), field programmable gate arrays (“FPGAs”), adaptive computing ICs, associated memory (such as RAM, DRAM and ROM), and other ICs and components. As a consequence, as used herein, the term controller (or processor) should be understood to equivalently mean and include a single IC, or arrangement of custom ICs, ASICs, processors, microprocessors, controllers, FPGAs, adaptive computing ICs, or some other grouping of integrated circuits which perform the functions discussed below, with associated memory, such as microprocessor memory or additional RAM, DRAM, SDRAM, SRAM, MRAM, ROM, FLASH, EPROM or E²PROM.

Ex. 1005, 18:11-29 (emphasis added).

Shteynberg further discloses “the controller 160, 260 may be implemented as an arrangement of controllers, microprocessors, DSPs and/or ASICs, collectively referred to as a ‘controller’, which are respectively programmed, designed, adapted or configured to implement the methodology of the invention, in conjunction with a memory 155.” Ex. 1005, 18:43-49.

A POSITA would recognize that Shteynberg disclosure of the controller 260 can be one more controllers that are distinct from controller 160. Therefore, Shteynberg discloses a secondary controller and anticipates claim 6 of the ‘759 Patent.

3. Claim 13

Claim 13 depends from dependent claim 6, which in turn depends from independent claim 1. Shteynberg anticipates claims 1 and 6 for the reasons discussed above and incorporated herein. *Supra* Sections IX.A.1-2. Claim 13 claims that the primary and secondary controllers are digital controllers. Ex. 1001, 11:19-20. The additional limitation of claim 13 is disclosed by Shteynberg.

For example, Shteynberg discloses:

[The] “controller” or “processor” 160, 260 may be any type of controller or processor, and may be embodied as ***one or more*** controllers 160, 260, adapted to perform the functionality discussed herein. As the term controller or processor is used herein, a controller 160, 260 may include use of a single integrated circuit (“IC”), or may

include use of a plurality of integrated circuits or other components connected, arranged or grouped together, such as **controllers**, microprocessors, digital signal processors (“DSPs”), parallel processors, multiple core processors, custom ICs, application specific integrated circuits (“ASICs”), field programmable gate arrays (“FPGAs”), adaptive computing ICs, associated memory (such as RAM, DRAM and ROM), and other ICs and components.

Ex. 1005, 18:8-21 (emphasis added).

Finally, Shteynberg discloses that

the present invention in general is related to power conversion, and more specifically, to a system, apparatus and method for supplying power to solid state lighting devices, such as for providing power to light emitting diodes (“LEDs”) and LEDs integrated with digital controllers or processors.

Ex. 1005, 1:18-22 (emphasis added).

Moreover, a POSITA would understand that the category of controllers/processor described above are digital because they each process data as a sequence of discrete values. Ex. 1002 ¶ 61. Therefore, Shteynberg discloses that the primary and secondary controllers are digital controllers, and claim 13 is anticipated by Shteynberg.

4. Claim 19

Claim 19 depends from independent claim 1. Shteynberg anticipates claim 1 for the reasons discussed above and incorporated herein. *Supra* Section IX.A.1. Claim 19 states the light fixture load is one of an Organic LED (OLED) load or an LED load. Ex. 1001, 12:1-2. The additional limitation of claim 19 is disclosed by Shteynberg.

For example, Shteynberg discloses that “the ‘electronic’ load 250, for example, is a system 105, 180, such as a current regulator (or converter) 100, 200 coupled to LEDs 140.” Ex. 1005, 10:45-47. Because, Shteynberg discloses that the light fixture load is an LED load, claim 19 is anticipated by Shteynberg.

5. Claim 20

a. 1[p] - A configurable light emitting diode (LED) driver for powering a set of light fixture loads comprising:

To the extent that the Board finds that the preamble is limiting, Shteynberg discloses “[i]n accordance with the present invention, therefore, an LED driver circuit is provided which is compatible for operation with the existing lighting infrastructure, such as dimmer switches, and may be coupled directly to and controlled by such dimmer switches.” Ex. 1005, 8:9-17. Shteynberg thus discloses a configurable LED driver/dimmer for powering a set of light fixture loads.

b. 1(a) - a power circuit including:

Shteynberg discloses a power circuit of the ‘759 Patent. For example, claim 28 of Shteynberg discloses “[a] power converter for providing variable brightness levels for solid state lighting, the power converter couplable to a phase-modulating switch which is couplable to an AC line voltage” Ex. 1005, 22:26-29. A power circuit generally is any circuit used to carry electricity that operates a load. As demonstrated by the above excerpt, the power converter carries electricity from the AC line voltage to provide variable brightness levels for solid state lighting. As such, a POSITA would readily understand that the power converter of Shteynberg is analogous to the power circuit of the ‘759 patent. Ex. 1002 ¶ 55. Therefore, Shteynberg discloses a power circuit.

c. 1(b) – inrush current limit;

Shteynberg discloses the inrush current limit of the ‘759 Patent. For example, Shteynberg discloses “[i]t may also be assumed during a first phase that dimmer switches generally and initially will not be changed or rewired, so all of their existing performance characteristics will be maintained, such as power harmonics, inrush currents during initial powering on, electromagnetic interference, and audio harmonics (such as buzzing).” Ex. 1005, 8:44-49. Shteynberg further discloses that “[t]he exemplary embodiments are also more power efficient, reducing the supplemented current (and therefore I^2R power loss) when there are other loads

providing or sinking currents or when the phase angle α is small.” Ex. 1005, 10:37-39.

A POSITA would readily understand that maintaining the level of inrush currents as described in Shteynberg is analogous to the inrush current limit of the ‘759 patent. Ex. 1002 ¶ 56. Therefore, Shteynberg discloses an inrush current limit.

d. 1(c) – DC/DC converter;

Shteynberg discloses the DC/DC converter of the ‘759 Patent. For example, Shteynberg discloses:

The switching power supply 150A is implemented in two stages, an AC/DC converter 265 and a buck converter 270. The AC/DC converter 265 is utilized to provide a high input impedance, thereby eliminating the high input capacitance that the single stage approaches have (and which can cause triacs of dimmers to misfire, as previously mentioned). This first stage will convert a relatively poor, phased modulated AC voltage into a manageable DC voltage, while the second stage (buck converter 270) will perform LED driving using current PWM, through switching transistor 355 (Q2).

Ex. 1005, 13:65-14:8.

A buck converter or step-down converter is a DC-to-DC converter that steps down voltage (while stepping up current) from its input (supply) to its output (load). Ex. 1002 ¶ 57. A POSITA would readily understand that the buck converter of

Shteynberg is equivalent to the DC/DC converter disclosed in the ‘759 Patent. *Id.*

Thus, Shteynberg discloses a DC/DC converter.

e. 1(d) - a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter;

Shteynberg discloses the power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter of the ‘759 Patent. As discussed above, Shteynberg discloses a LED driver having an inrush current limit and DC/DC converter. Shteynberg further discloses “[t]he current regulator 100 comprises a rectifier 10, an impedance matching circuit 120, and a switching power supply (or driver) 130.” Ex. 1005, 8:65-67. Shteynberg further discloses that:

FIG. 7 is a block diagram of an exemplary second embodiment of a current regulator (or converter) 200 in accordance with the teachings of the present invention. The current regulator 200 comprises a rectifier 110, an impedance matching circuit 120, a switching power supply (or driver) 150, and further includes a controller 160 coupled to receive an output from the dimmer switch 75.

Ex. 1005, 9:3-9.

Finally, Shteynberg discloses the power stage of the converter 100, 200 has a number of features to make it compatible with the phase modulated input voltage. These features include the “built-in capability to deliver power factor correction without additional power components.” Ex. 1005, 16:61-63.

Shteynberg not only discloses a power factor correction boost, it also discloses that the power factor boost is connected to the DC/DC converter and the inrush current limit. As such, Shteynberg discloses a power factor correction (PFC) boosted connected to the inrush current limit and the DC/DC converter as required by claim 1 of the '759 Patent.

f. 1(e) - a regulated output voltage bus connected to the DC/DC converter;

Shteynberg discloses the regulated output voltage bus connected to the DC/DC converter of the '759 Patent. For example, Shteynberg discloses:

FIG. 7 is a block diagram of an exemplary second embodiment of a current regulator (or converter) 200 in accordance with the teachings of the present invention. The current regulator 200 comprises a rectifier 110, an impedance matching circuit 120, a switching power supply (or driver) 150, and further includes a controller 160 coupled to receive an output from the dimmer switch 75. The current regulator 200 also provides power to one or more LEDs 140, which also may be an array or multiple arrays of LEDs 140 or any type or color, with the regulator 200 and LEDs 140 forming a system 180.

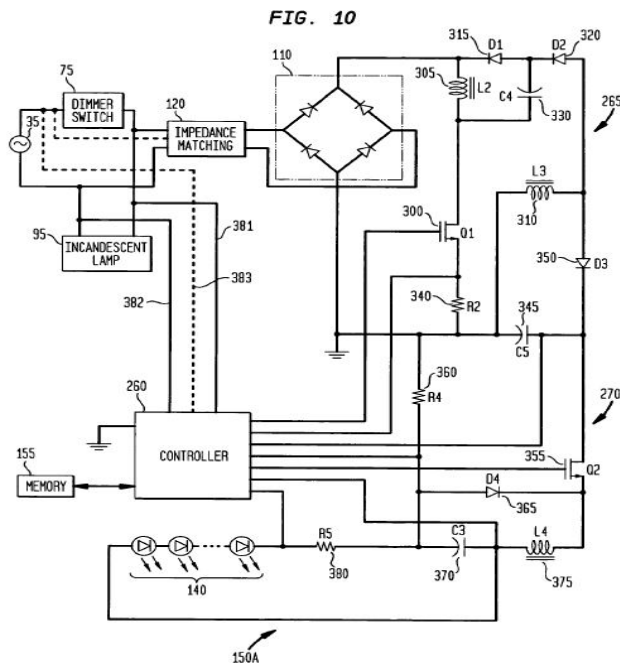
Ex. 1005, 9:3-12.

Shteynberg further discloses that the “switching power supply 150A is implemented in two stages, an AC/DC converter 265 and a buck converter 270.” Ex. 1005, 13:65-67, fig. 10

A POSITA would understand that the switching power supply 150 disclosed in Shteynberg is the equivalent of the regulated output voltage bus of the ‘759 patent. Ex. 1002 ¶ 58. Similarly, as discussed above, a POSITA would understand that the buck converter 270 is equivalent to the DC/DC converter of the ‘759 Patent. *Id.* ¶ 57; *supra* Section IX.A.1.b. Further, the switching power supply 150 is connected to the buck converter 270. Ex, 1005, 13:65-67. As such, Shteynberg discloses a regulated output voltage bus connected to the DC/DC converter as required by claim 1 of the ‘759 Patent.

g. 1(f) - at least one power limit connected to the output voltage bus;

Shteynberg discloses at least one power limit connected to the output voltage bus. For example, Shteynberg discloses “FIG. 10 is a circuit diagram of an exemplary embodiment of a switching power supply 150A for a current regulator (or converter) 100, 200 in accordance with the teachings of the present invention.” Ex. 1005, 13:34-37.



Ex. 1005, fig. 10.

Shteynberg further discloses that “the controller 160 (and 260, FIG. 10) is programmed, adapted or configured to emulate the brightness or intensity control provided by the dimmer switch 75, to control the switching power supply 150 and correspondingly modify the brightness (or intensity) provided by the LEDs 140.”

Ex. 1005, 9:21-26. A POSITA would understand that emulated brightness or intensity is equivalent to establishing a power limit. Ex. 1002 ¶ 59. A POSITA would further understand that the controller is programmed to limit power provided by the dimmer switch and is connected to the switching power supply 150, which as discussed above is equivalent to the regulated output voltage bus. *Id.*; *supra* Section

IX.A.5.f. As such, Shteynberg discloses at least one power limit connected to the output voltage bus required by claim 1 of the '759 Patent.

- h. 1(g) - a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load, and;**

Shteynberg discloses a set of output current drives connected to one of the set of light fixture loads for powering the connected light fixture load. For example, Shteynberg discloses that:

LED driver circuits and LEDs [(i.e., light fixture loads)] will be wired within existing lighting infrastructure, such as replacing an incandescent bulb (placed within an Edison socket) or replacing an incandescent lamp, with wiring to existing switches, such as dimmer switches. In a second phase, existing switching connections may be re-wired, allowing LED driver circuits to be co-located in the same junction or wall box as the switches, but wired directly to the AC line voltage, with existing switching (such as dimmers) generating only a control signal to regulate LED brightness.

Ex. 1005, 8:20-29.

Shteynberg discloses generating a control signal to regulate LED brightness.

Id. As such, Shteynberg discloses a set of output current drivers connected to one of the set of light fixture loads for powering the connected light fixture load.

B. Ground 2: Shteynberg in View of Kim Renders Claims 2, 5, 15, and 19 Obvious

For the reasons stated below, claims 2, 5, 15, and 19 of the ‘759 Patent are rendered obvious under 35 U.S.C. § 103 by Shteynberg in view of Kim. Shteynberg anticipates independent claim 1 for the reasons discussed above and incorporated here. *Supra* Section IX.A.1.

1. Claim 2

Claim 2 depends from independent claim 1. Shteynberg anticipates claim 1 for the reasons discussed above and incorporated herein. *Supra* Section IX.A.1. The additional limitations of claim 2 are disclosed by Kim. Claim 2 requires that the apparatus for configuring comprises at least one port associated with at least one of the set of output current drivers for configuration of the output current drivers. Ex. 1001, 10:56-59. Like the ‘759 Patent, Kim discloses at least one port associated with at least one of the set of output current drivers for configuration of the output current drivers.

For example, Kim discloses “an LED driving unit supplying the plurality of first powers maintained in current balancing by the current balancing unit to a plurality of LED units.” Ex. 1006, 1[0010]-2[0010]. Kim further discloses “[f]or example, when the power Supply device for driving an LED according to an exemplary embodiment of the present invention is employed for a display device,

the operating unit 160 may perform an operation to provide an image, a sound, and the like, required for the display device. Ex. 1006, 5[0061].

A POSITA would understand that a port would be required to configure the output current drivers to provide the proper signal (including the proper current level) to operating unit 160 which performs a pre-set operation. Ex. 1002 ¶ 65.

The Shteynberg-Kim combination thus discloses at least one port associated with at least one of the set of output current drivers for configuration of the output current drivers and renders claim 2 obvious.

2. Claim 5

Claim 5 depends from dependent claim 2 which depends from independent claim 1. Shteynberg anticipates claim 1 for the reasons discussed above and incorporated herein. *Supra* Section IX.A.1. The additional limitations of claim 5 are disclosed by Kim. Claim 5 requires that the apparatus for configuring programs the output current set point. Ex. 1001, 10:64-65.

Like the '759 Patent, Kim discloses programming an output current set point. For example, Kim discloses that “because driving power is supplied to the LED lamps of multiple channels by the single transformer and the current balancing of the driving powers supplied to the respective LED lamps is maintained, the constant current flowing at the respective LED lamps can be controlled.” Ex. 1006, 8[0119].

A POSITA would understand that regulating the constant current flowing to the LED lamps is analogous to programming the output current set point. Ex. 1002 ¶ 65. The Shteynberg-Kim combination thus discloses the apparatus for configuring programs the output current set point and renders claim 5 obvious.

3. Claim 15

Claim 15 depends from independent claim 1. Shteynberg anticipates claim 1 for the reasons discussed above and incorporated herein. *Supra* Section IX.A.1. The additional limitations of claim 15 are disclosed by Kim.

Claim 15 of the ‘759 Patent states that “the output voltage bus is connected to at least one power limit.” Ex. 1001, 11:24-25. Like the ‘759 Patent, Kim discloses:

With reference to FIG. 1, the power supply device 100 for driving a light emitting diode (LED) may include a filter unit 110 canceling electromagnetic interference (EMI) included in commercial AC power, a rectifying unit 120 rectifying the filtered power from the filter unit 110, a power factor correction unit 130 correcting a power factor by correcting a phase difference between the current and voltage of the rectified power from the rectifying unit 120, a power conversion unit 140, an LED driving unit 150, an operating unit 160, a power conversion controller 170, a feedback unit 180, and a current balancing unit 190.

Ex. 1006, 4:55.

A POSITA would understand that the power factor correction unit correcting the power factor by correcting the phase difference between, *inter alia*, a current balancing unit is analogous to the output voltage bus connected to a power limit. Ex. 1002 ¶ 66. The Shteynberg-Kim combination thus discloses wherein the output voltage bus is connected to at least one power limit and renders claim 15 obvious.

4. Claim 19

Claim 19 depends from independent claim 1. Shteynberg anticipates claim 1 for the reasons discussed above and incorporated herein. *Supra* Section IX.A.1. The additional limitations of claim 19 are disclosed by Kim.

Claim 19 of the ‘759 Patent states that the light fixture load is one of an Organic LED (OLED) load or an LED load. Ex. 1001, 12:1-2.

Like the ‘759 patent, Kim discloses “[a] power supply device for driving a light emitting diode (LED) capable of controlling the switching of multiple output powers, in synchronization with the frequency of one of the multiple output powers and simplifying a power conversion stage in supplying power for driving an LED.” Ex. 1006, 1[0003].

Kim’s disclosure of a power supply device for supplying power for driving an LED is analogous to claim 19’s requirement that the light fixture load be one of an Organic LED (OLED) load or an LED load. *Compare* Ex. 1006, 1[0003], *with* Ex. 1001, 12:1-2. A POSITA would understand that the LED driver disclosed in

Shteynberg can drive the LEDs disclosed in Kim. Ex. 1002 ¶ 66. Thus, the Shteynberg-Kim combination renders claim 19 obvious.

C. Ground 3: Shteynberg in View of Morgan Renders Claims 8, 9, 16-17, 19 and 24 Obvious

Claims 9 and 16-17, and 19 of the ‘759 patent are rendered obvious under 35 U.S.C. § 103 by Shteynberg in view of Morgan. Shteynberg anticipates independent claim 1 for the reasons discussed above and incorporated here. *Supra* Section IX.A.1.

1. Claim 8

Claim 8 depends from claim 6 which depends from independent claim 1. Claim 6 depends from independent claim 1. Shteynberg anticipates independent claims 1 and 6 for the reasons discussed above and incorporated here. *Supra* Sections IX.A.1-2. The additional limitations of claim 8 are disclosed by Morgan. Claim 8 requires that the LED driver further include a communication interface for receiving data from an external transmitter. Ex. 1001, 11:3-5.

Like the ‘759 Patent, Morgan discloses a communication interface receiving data from an external transmitter. For example, Morgan discloses:

A lights/interfaces pane lists lighting units or ***lighting unit interfaces*** that are capable of being managed by the management tool. Interfaces may include power/data supplies (PDS) 1758 for one or more lighting systems, DMX interfaces, DALI interfaces, interfaces for individual

lighting units, interfaces for a tile lighting unit, or other suitable interfaces.

Ex. 1007, 31[0433] (emphasis added).

A POSITA would understand that the lighting unit interfaces (e.g., DMX interfaces) of Morgan are equivalent to the communication interface for receiving data from an external transmitter of the '759 Patent. Ex. 1002 ¶¶ 71-73. The Shteynberg-Morgan combination thus discloses an LED driver a communication interface for receiving data from an external transmitter and renders claim 8 obvious.

2. Claim 9

Claim 9 depends from independent claim 1. Shteynberg anticipates independent claim 1 for the reasons discussed above and incorporated here. *Supra* Section IX.A.1. The additional limitations of claim 9 are disclosed by Morgan. Claim 9 requires that the communication interface is either DMX512A, 0-10Vdc analog control, Zigbee wireless or Remote Device Management (RDM) compatible. Ex. 1001, 11:6-9.

Like the '759 Patent, Morgan discloses a communication interface that is either DMX512A, 0-10Vdc analog control, Zigbee wireless or Remote Device Management (RDM) compatible. For example, Morgan discloses:

A lights/interfaces pane lists lighting units or lighting unit interfaces that are capable of being managed by the management tool. Interfaces may include power/data supplies (PDS) 1758 for one or more lighting

systems, ***DMX interfaces***, DALI interfaces, interfaces for individual lighting units, interfaces for a tile lighting unit, or other suitable interfaces.

Ex. 1007, 31[0433] (emphasis added).

A POSITA would understand that the DMX interfaces of Morgan are equivalent to the DMX512A communication interface of the ‘759 Patent. Ex. 1002 ¶¶ 71-73. The Shteynberg-Morgan combination thus discloses the communication interface is either DMX512A, 0-10Vdc analog control, Zigbee wireless or Remote Device Management (RDM) compatible and renders claim 9 obvious.

3. Claim 16

Claim 16 depends from independent claim 1. Shteynberg anticipates independent claim 1 for the reasons discussed above and incorporated here. *Supra* Section IX.A.1. The additional limitations of claim 16 are disclosed by Morgan.

Claim 16 of the ‘759 Patent states that “the set of output current drivers comprise a buck topology power converter.” Ex. 1001, 11:26-27. Like the ‘759 Patent, Morgan discloses a buck topology power converter. For example, Morgan discloses “[t]he electronic component may be a buck converter, a flyback converter, or a current regulator.” Ex. 1007, 3:0035. A buck topology power converter is equivalent to a buck converter. Ex. 1002 ¶¶ 57.

The Shteynberg-Morgan combination thus discloses the set of output current drivers comprise a buck topology power converter and renders claim 16 obvious.

4. Claim 17

Claim 17 depends from independent claim 1. Shteynberg anticipates independent claim 1 for the reasons discussed above and incorporated here. *Supra* Section IX.A.1. The additional limitations of claim 17 are disclosed by Morgan. Claim 17 of the '759 Patent states that the LED driver further comprises "a housing portion for housing the components of the driver." Ex. 1001, 11:28-29.

Like the '759 Patent, Morgan discloses a housing portion. For example, Morgan discloses:

Referring to FIG. 9, housings 800 may include a housing for an architectural lighting fixture 810, such as a wall-washing fixture. Housings 800 may be square, rectangular 810, circular, cylindrical 812, or linear 814. A linear housing 814 may be equipped with a diffuser 502 to simulate a neon light of various shapes, or it may be provided without a diffuser, such as to light an alcove or similar location. A housing 800 may be provided with a watertight seal, to provide an underwater lighting system 818.

Ex. 1007, 12[0256].

It would have been obvious to a POSITA to modify the LED driver of Shteynberg to include a housing. Ex. 1002 ¶ 72. A POSITA would know that the

LED driver of Shteynberg would require a container or housing in which to protect the sensitive electronic components from dust, water, etc. *Id.* Thus, the Shteynberg-Morgan combination renders claim 17 obvious.

5. Claim 19

Claim 19 depends from independent claim 1. Shteynberg anticipates independent claim 1 for the reasons discussed above and incorporated here. *Supra* Section IX.A.1. The additional limitations of claim 19 are disclosed by Morgan.

Claim 19 of the ‘759 Patent states that the “light fixture load is one of an Organic LED (OLED) load or an LED load.” Ex. 1001, 12:1-2.

Like the ‘759 Patent, Morgan discloses:

Methods and systems are provided for LED modules that include an LED die integrated in an LED package with a submount that includes an electronic component for controlling the light emitted by the LED die. The electronic component integrated in the submount may include drive hardware, a network interface, memory, a processor, a switch-mode power supply, a power facility, or another type of electronic component.

Ex. 1007, 1[0012].

A POSITA would understand that Morgan’s disclosure of an LED die integrated in an LED package is analogous to claim 19’s requirement that the light

fixture load is an LED load. Thus, the Shteynberg-Morgan combination renders claim 19 obvious.

6. Claim 24

Claim 24 depends from independent claim 20. Shteynberg anticipates claim 20 for the reasons discussed above and incorporated herein. *Supra* Section IX.A.5. The additional limitations of claim 24 are disclosed by Morgan. Claim 24 of the ‘759 Patent states that “[t]he LED driver of claim 20 wherein the regulated output voltage bus and at least one power limit are enclosed within a housing.” Ex. 1001, 12:25-27. The ‘759 Patent further states that “[t]he LED dimmer 10 includes a body portion 12, or housing . . .” Ex. 1001, 3:38-39.

Like the ‘759 Patent, Morgan discloses “a housing portion for housing the components of the driver.” For example, Morgan describes “[t]he system 100 may optionally include a housing 800, which in embodiments may hold the board 204, the electrical facility 202, the mechanical interface 3200, and the thermal facility 2500.” Ex. 1006, 6[0184].

A POSITA would understand that the housings disclosed in Shteynberg and Morgan would enclose the entirety of the electrical components of the LED driver including the regulated output voltage bus and at least one power limit. Ex. 1002 ¶ 72. As such, the Shteynberg-Morgan combination thus discloses the LED driver/dimmer of claim 20 further comprises a housing wherein the regulated output

voltage bus and at least one power limit are enclosed within the housing and renders claim 24 obvious.

D. Motivation to Combine Shteynberg and Kim and/or Morgan

A POSITA would have been motivated to combine Shteynberg and Kim and/or Morgan for several reasons. *See* Ex. 1002 ¶¶ 73-82.

First, Shteynberg, Kim, and Morgan are analogous art to the '759 patent because they are in the same field of endeavor—namely, LED Drivers. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). The '759 Patent defines its “Technical Field” as a “novel LED Driver/dimmer for solid state lighting applications.” Ex. 1001, 1:40-41. Like the '759 Patent, Shteynberg, Kim, and Morgan. are directed to powering and controlling solid state lighting applications. Ex. 1005, 1:18; Ex. 1006, Abstract; *supra* Section IX.A.

Moreover, for the reasons provided in Section IX.C. incorporated here, Shteynberg and Kim and/or Morgan are analogous to the '759 Patent because they are reasonably pertinent to the technical problems allegedly addressed by the claimed invention. *In re Bigio*, 381 F.3d at 1325.

Finally, a POSITA would have had a reasonable expectation of success in making this modification. The LED Driver components described in Shteynberg and Kim and/or Morgan were well-known at the time. *See, e.g., supra* Section IX.C; Ex. 1005, 1:25 (“A wide variety of off-line LED drivers are known”). As such, it would

also have been straightforward for a POSITA to modify the LED driver of Shteynberg to include Kim's and Morgan's housing, buck topology power converter, output current set point, and communication interfaces, and that such a system would work.

E. The Board Should Not Discretionarily Deny Institution

The PTAB should not exercise its discretion to deny review where, as here, the Petition is strong on the merits. *See, e.g., Apple Inc. v. RFCyber Corp.*, No. IPR2022-00412, Paper 11, at 33-34 (P.T.A.B. July 21, 2022); Interim Procedure for Discretionary Denials In AIA Post Grant Proceedings With Parallel District Court Litigation (Discretionary Denial Memorandum), USPTO Dir.'s Memorandum 9 (June 21, 2022).

Apple Inc. v. Fintiv, Inc., No. IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020), articulated an additional standard, under which the PTAB may decline to institute IPR based on a number of factors ("*Fintiv* factors") related to the existence of a parallel district court proceeding on the same challenged patents. The PTAB considers the following non-exclusive *Fintiv* factors:

- (1) whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
- (2) proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;
- (3) investment in the parallel proceeding by the court and the parties;

- (4) overlap between issues raised in the petition and in the parallel proceeding;
- (5) whether the petitioner and the defendant in the parallel proceeding are the same party; and
- (6) other circumstances that impact the Board's exercise of discretion, including the merits.

Id. In this instance, the stage of the parallel district court litigation does not support denying institution based on the *Fintiv* factors.

1. Factor 1: Whether the Court Granted a Stay

Neither party has requested a stay in this case nor has one been ordered by the District Court. Factor 1 is, therefore, neutral because no party has requested a stay (yet).

2. Factor 2: Proximity of Trial Date

Factor 2 favors institution or is neutral. *Intel Corp. v. PACT XPP Schweiz AG*, No. IPR2020-00542, Paper 11, at 14 (P.T.A.B. Sept. 9, 2020); Discretionary Denial Memorandum 8 (explaining that when other factors weigh against denial or are neutral, proximity to trial should not alone control). The U.S. District Court for the Southern District of California issued a scheduling order on March 22, 2023, setting a final pretrial conference on August 22, 2024. Ex. 1008. Based on the most recent statistics showing a median time from filing to trial in a civil proceeding to be 46

months, disposition of this case can occur as late as April 2026, which will be 17 months after the Final Written Decision. Ex. 1009.

3. Factor 3: Investment in Parallel Proceedings

Factor 3 favors institution. The district court litigation is still in its early stages where discovery has begun, but no claim construction briefs have been filed.

4. Factor 4: Overlap of Issues

Factor 4 favors institution because the Final Written Decision here will likely trigger estoppel. Additionally, in the district court litigation, all of mate's asserted claims are subject to Advanced Lighting Concepts's IPRs.

5. Factor 5: Whether Petitioner and Defendant are the Same Party

Factor 5 is neutral because "[a]ll parties to this proceeding are included in the related [] proceeding." *Cast Lighting, LLC v. Wangs Alliance Corp.*, PGR2021-00012, Paper 12, at 36 (P.T.A.B. June 7, 2021).

6. Factor 6: Other Circumstances

Factor 6 favors institution and is dispositive under the Discretionary Denial Memorandum because the unpatentability challenges here are compelling and rely on references that Petition for IPR of U.S. Patent No. 9,049,759 were not before the Office. Additionally, Advanced Lighting Concepts's IPRs are the only challenges to the Asserted Patents that have been before the Board, which favors institution. And there is a strong public interest against "leaving bad patents enforceable," which also

favours institution. *Thryv, Inc. v. Click-To-Call Techs., LP*, 140 S. Ct. 1367, 1374 (2020).

Because all *Fintiv* factors favor institution or are neutral, Advanced Lighting Concepts respectfully requests that the Board decline to discretionarily deny review.

X. CONCLUSION

Trial should be instituted, and the Challenged Claims should be canceled as unpatentable.

Dated: August 3, 2023

Respectfully submitted,

By: / Winston O. Huff /

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**ATTORNEYS FOR PETITIONER
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U.S. PATENT NO. 9,049,759 – LISTING OF CHALLENGED CLAIMS

<u>CLAIM NO.</u>	<u>CLAIM ELEMENTS</u>
1[p]	1. A configurable light emitting diode (LED) driver for powering a set of light fixture loads comprising:
1[a]	a power circuit including an inrush current limit; a DC/DC converter;
1[b]	a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter;
1[c]	a regulated output voltage bus connected to the DC/DC converter;
1[d]	a primary controller for controlling the power circuit;
1[e]	a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load, and;
1[f]	an apparatus for configuring the set of output current drivers to an output current set point.
2	The LED driver of claim 1 wherein the apparatus for configuring comprises at least one port associated with at least one of the set of output current drivers for configuration of the output current drivers.
5	The LED driver of claim 2 wherein the apparatus for configuring programs the output current set point.
6	The LED driver of claim 1 wherein the apparatus for configuring is integrated with a secondary controller.
8	The LED driver of claim 6 further comprising a communication interface for receiving data from an external transmitter.
9	The LED driver of claim 8 wherein the communication interface is either DMX512A, 0-10Vdc analog control, Zigbee wireless or Remote Device Management (RDM) compatible.

<u>CLAIM NO.</u>	<u>CLAIM ELEMENTS</u>
13	The LED driver of claim 6 wherein the primary and secondary controllers are digital controllers.
15	The LED driver of claim 1 wherein the output voltage bus is connected to at least one power limit.
16	The LED driver of claim 1 wherein the set of output current drivers comprise a buck topology power converter.
17	The LED driver of claim 1 further comprising a housing portion for housing the components of the driver.
19	The LED driver of claim 1 wherein the light fixture load is one of an Organic LED (OLED) load or an LED load.
20[p]	A configurable light emitting diode (LED) driver for powering a set of light fixture loads comprising:
20[a]	a power circuit including:
20[b]	an inrush current limit;
20[c]	a DC/DC converter;
20[d]	a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter;
20[e]	a regulated output voltage bus connected to the DC/DC converter; and
20[f]	at least one power limit connected to the regulated output voltage bus; and
20[g]	a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load.
24	The LED driver of claim 20 wherein the regulated output voltage bus and at least one power limit are enclosed within a housing.

CERTIFICATION OF COMPLIANCE WITH TYPE-VOLUME LIMITS

This Petition includes 9,605 words, as counted by Microsoft Word, and is therefore in compliance with the 14,000-word limit established by 37 C.F.R. § 42.24(a)(1)(i). Accordingly, pursuant to 37 C.F.R. § 42.24(d), lead counsel for the Petitioner hereby certifies that this Petition complies with the type-volume limits established for a petition requesting IPR.

Dated: August 3, 2023

Respectfully Submitted,

/ Winston O. Huff /

Winston O. Huff (Reg. No. 51, 825)

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(4) and 42.105, lead counsel for Petitioners hereby certifies that on August 3, 2023, copies of this Petition, Power of Attorney, and all supporting exhibits were sent via Federal Express to the correspondence address of record for the '759 patent:

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A courtesy copy of this Petition and supporting exhibits was also served via email on the Patent Owner's counsel of record in the district court litigation.

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