

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

OSRAM OPTO SEMICONDUCTORS
GMBH, OSRAM GMBH AND OSRAM
SYLVANIA INC.,

Plaintiffs,

V.

HEALTHe, INC. and
LIGHTING SCIENCE GROUP CORP.,

Defendants.

C.A. No. 19-1616-LPS

JURY TRIAL DEMANDED

AMENDED COMPLAINT

Plaintiff OSRAM Opto Semiconductors GmbH, OSRAM GmbH and OSRAM SYLVANIA Inc. (collectively “OSRAM”) file this first amended patent infringement action against Defendants Healthe, Inc. and Lighting Science Group Corp. and alleges as follows:

NATURE OF THE ACTION

1. This is a civil action for patent infringement under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*

THE PARTIES

2. Plaintiff OSRAM Opto Semiconductors GmbH is a German corporation with its principal place of business at Leibnizstr. 4, 93055 Regensburg, Germany.

3. Plaintiff OSRAM GmbH is a German corporation with its principal place of business at Marcel-Breuer-Straße 6, 80807 Munich, Germany.

4. Plaintiff OSRAM SYLVANIA Inc. is a Delaware corporation, having its principal place of business at 200 Ballardvale Street, Wilmington, Massachusetts 01887.

5. OSRAM is a global leading lighting manufacturer with a history dating back more than 100 years. OSRAM has a portfolio of more than 2,000 patents issued in the United States, and more than 17,000 patents issued and applications filed worldwide. OSRAM's portfolio ranges from high-tech applications based on semiconductor technology, such as infrared or laser lighting, to smart and connected lighting solutions in buildings and cities. As a cutting-edge high-tech enterprise, OSRAM is committed to enhancing people's lives in the digital age and improving the sustainability of the planet.

6. OSRAM's identity is shaped by a long tradition of innovation in the field of lighting technology. Today, OSRAM is a leading innovator in light-based mobility, safety and security, well-being and health, as well as connectivity. The company has introduced laser-based lighting technologies for autonomous driving systems, applications that increase security via iris recognition, biodynamic lighting solutions that improve human well-being, smart farming technologies that increase food production, and a number of applications directed to intelligently-connected lighting, along with numerous technological advancements in semiconductors and LEDs employing near infrared, visible and ultraviolet light. OSRAM's capacity for innovation is constantly being deployed in new fields, with an eye towards the future.

7. On information and belief, Healthe, Inc. ("Healthe") is a corporation organized under the laws of Delaware, with corporate headquarters and principal place of business at 801 N. Atlantic Avenue, Cocoa Beach, Florida 32931. On information and belief, Healthe is as a wholly-owned subsidiary of Lighting Science Group Corporation.

8. On information and belief, Lighting Science Group Corporation ("LSG") is a corporation organized under the laws of Delaware, with its corporate headquarters at 1350

Division Road, Suite 204, West Warwick, Rhode Island 02893, and its principal place of business at 801 N. Atlantic Avenue, Cocoa Beach, Florida 32931.

9. On information and belief, Healthe was founded as a wholly-owned subsidiary of LSG on October 23, 2018. Healthe engages in the manufacture, research, development, and sale of devices and systems that use LEDs as the light source. Healthe manufactures, offers for sale, and/or sells products that were previously manufactured and/or sold by LSG, including accused products in this lawsuit. Healthe also continues to provide services to LSG's former customers.

10. Healthe's LED-based products (collectively, the "Accused Products") include the Awake & Alert (LS BR30 75WE AA 120 G2 BX) ("Awake & Alert"), the GoodDay #FG-07005 (LSH A19 60WE GD 120 SH BX) ("GoodDay"), the Sleepy Baby #FG07000 (LSH P15 25WE SLPB 120 SH BX) ("Sleepy Baby"), the JOURNI #FG-07028 (LSH TRVLGT GDGN 10W SL) ("Journi"), the SunLync Wireless Control Device, used in conjunction with the SunTrac App, and Good Day & Night LED Downlight ("the LSG Suntrac System"), and the Cleanse Air-Sanitizing LED Troffer ("the Cleanse Troffer").

11. On information and belief, both LSG and Healthe have received substantial funding, investment and capital contributions from Pegasus Capital Advisors L.P. ("Pegasus"), which on information and belief has its headquarters located at 750 East Main Street, Suite 600 Stamford, CT 06902. Upon information and belief, the funding, investment and capital contributions that LSG and Healthe have received from Pegasus have been used by LSG and Healthe for, among other purposes, to promote the manufacture, offer for sale, and/or sale of various lighting products provided by LSG and Healthe, including the Accused Products.

JURISDICTION AND VENUE

12. This action arises under the patent laws of the United States, 35 U.S.C. § 1 et seq. This Court has subject matter jurisdiction over this action for patent infringement under 28 U.S.C. §§ 1331 and 1338(a).

13. This Court has personal jurisdiction over Defendant Healthe because it is incorporated in the State of Delaware and in this judicial district.

14. This Court has personal jurisdiction over Defendant LSG because it is incorporated in the State of Delaware and in this judicial district.

15. Defendants offer to sell and sell products that infringe one or more of OSRAM's asserted patents to customers located in the State of Delaware, and in this judicial district or for use in this judicial district. For example, Healthe maintains an authorized sales force for Delaware. *See* <https://healthelighting.com/pages/healthe-agency-sales-force>. In addition, Healthe offers for sale and sells its products from its website for shipment to purchasers throughout the State of Delaware and this judicial district.

16. Venue is proper in this Court pursuant to 28 U.S.C. §1400(b) at least because Healthe and LSG are incorporated in this judicial district. In addition, on information and belief, Healthe and LSG have committed acts of infringement in the State of Delaware and in this judicial district, including but not limited to offering to sell and selling products that infringe one or more of OSRAM's asserted patents to customers located in this judicial district or for use in this judicial district.

17. Joinder of Defendants is proper pursuant to 35 U.S.C. § 299 at least because the manufacture, offer for sale, and/or sale of infringing products arise out of the common or concerted actions of the Defendants. In addition, questions of fact common to both Defendants

will arise in the action because Defendants' infringement arises from their common or concerted acts of manufacturing, offering for sale, and selling infringing products.

PATENTS-IN-SUIT

18. On May 16, 2006, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,045,956 ("the Braune '956 patent"), entitled "Light Emitting Diode With Wavelength Conversion," to Braune et al. OSRAM GmbH is the owner by assignment of the Braune '956 patent. A true and correct copy of the Braune '956 patent is attached hereto as Exhibit A.

19. On June 5, 2007, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,227,191 ("the Eberhard '191 patent"), entitled "Optoelectric Component Having a Plurality of Current Expansion Layers and Method for Producing It," to Eberhard et al. OSRAM Opto Semiconductors GmbH is the owner by assignment of the Eberhard '191 patent. A true and correct copy of the Eberhard '191 patent is attached hereto as Exhibit B.

20. On July 4, 2017, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,698,282 ("the Jaeger '282 patent"), entitled "Optoelectronic Component and Method for Producing an Optoelectronic Component," to Jaeger. OSRAM Opto Semiconductors GmbH is the owner by assignment of the Jaeger '282 patent. A true and correct copy of the Jaeger '282 patent is attached hereto as Exhibit C.

21. On June 7, 2011, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,957,146 ("the Kraus '146 patent"), entitled "Illumination Device Comprising a Substrate Plate and a Heat Sink," to Kraus et al. OSRAM GmbH is the owner by

assignment of the Kraus '146 patent. A true and correct copy of the Kraus '146 patent is attached hereto as Exhibit D.

22. On January 5, 2010, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,642,734 ("the De Anna '734 patent"), entitled "Method and System for Dimming Light Sources," to De Anna. OSRAM GmbH is the owner by assignment of the De Anna '734 patent. A true and correct copy of the De Anna '734 patent is attached hereto as Exhibit E.

23. On February 1, 2005, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,848,819 ("the Arndt '819 patent"), entitled "Light-Emitting Diode Arrangement," to Arndt et al. OSRAM Opto Semiconductors GmbH is the owner by assignment of the Arndt '819 patent. A true and correct copy of the Arndt '819 patent is attached hereto as Exhibit F.

24. On January 19, 2016, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,241,392 ("the Chemel '392 patent"), entitled "Method, Systems and Apparatus for Providing Variable Illumination," to Chemel, et al. OSRAM SYLVANIA Inc. is the owner by assignment of the Chemel '392 patent. A true and correct copy of the Chemel '392 patent is attached hereto as Exhibit G.

25. On August 9, 2011, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,994,519 ("the Fehrer '519 patent"), entitled "Semiconductor Chip and Method for Producing a Semiconductor Chip," to Fehrer, et al. OSRAM Opto Semiconductors GmbH is the owner by assignment of the Fehrer '519 patent. A true and correct copy of the Fehrer '519 patent is attached hereto as Exhibit H.

THE LSG/HEALTHE ITC COMPLAINT / DEFENDANTS' INFRINGING ACTIVITIES

26. On April 30, 2019, LSG and Healthe jointly filed a complaint alleging patent infringement with the International Trade Commission (“ITC Complaint”). The complaint and associated exhibits in that action, *in re Certain Light Emitting Diode Products, Systems, and Components Thereof*, Investigation No. 337-TA-1168, which are incorporated herein by reference, include allegations relating to LSG’s and Healthe’s claims that there exists a domestic industry protected by the patents it asserts in the ITC Complaint. Specifically, LSG’s and Healthe’s claims that one or more Healthe products are covered by the patents asserted in the ITC Complaint.

27. By way of example, in footnote 1 of Exhibit 89C to the ITC Complaint, which sets forth LSG’s and Healthe’s domestic industry allegations for the Sleepy Baby P15 LED light bulb as it relates to claims 1, 2, 6 and 10 of U.S. Patent No. 7,528,421 (“the ’421 patent”), LSG and Healthe represent that “[p]rior to January 1, 2019 the Sleepy Baby P15 LED Bulb was developed, designed, sold and supported by LSG, which incurred all domestic industry expenditures counted for this product in support of this complaint.” LSG and Healthe in footnote 1 of Exhibit 89C to their IT Complaint further represent that “[s]ince January 1, 2019, the Sleepy Baby P15 LED Bulb has been sold and supported by Healthe, a wholly-owned subsidiary of LSG and licensee to the Asserted Patents [including the ’421 patent].”

28. Similarly, in footnote 1 of Exhibit 90C of their ITC Complaint, which sets forth LSG’s and Healthe’s domestic industry allegations for the Journi Mobile LED Task Light as it relates to claims 1, 2, 6 and 10 of the ’421 patent, LSG and Healthe represent that “[p]rior to January 1, 2019 the JourniTM Mobile LED Task Light was developed, designed, sold and supported by LSG, which incurred all domestic industry expenditures counted for this product in

support of this complaint.” LSG and Healthe in footnote 1 of Exhibit 90C to their ITC Complaint further represent that “[s]ince January 1, 2019, the Journi™ Mobile LED Task Light has been sold and supported by Healthe, a wholly-owned subsidiary of LSG and licensee to the Asserted Patents [including the ’421 patent].”

29. Likewise, in footnote 1 of Exhibit 91C to their ITC Complaint, which set forth LSG’s and Healthe’s domestic industry allegations for the Cleanse Troffer as it relates to claims 1-2, 4, 10, 12 and 14 of U.S. Patent No. 8,506,118 (“the ’118 patent”), LSG and Healthe represent that “[p]rior to January 1, 2019 the Cleanse Air-Sanitizing LED Troffer was developed, designed, sold and supported by LSG, which incurred all domestic industry expenditures counted for this product in support of this complaint.” LSG and Healthe in footnote 1 of Exhibit 91C to their ITC Complaint further represent that “[s]ince January 1, 2019, the Cleanse Air-Sanitizing LED Troffer has been sold and supported by Healthe, a wholly-owned subsidiary of LSG and licensee to the Asserted Patents [including the ’118 patent].”

30. Additionally, in footnote 1 of Amended Exhibit 95C of their ITC Complaint, which sets forth LSG’s and Healthe’s domestic industry allegations for the Sun Trac System as it relates to claims 20 and 28 of the U.S. Patent No. 8,674,608 (“the ’608 patent”), LSG and Healthe represent that “[p]rior to January 1, 2019 the development, design, sales and support for the Good Day & Night® LED Downlight, the SunLync™ Wireless Control Device, and SunTrac™ App were carried out by LSG, which incurred all domestic industry expenditures counted for these products in support of this complaint.” LSG and Healthe in footnote 1 of Exhibit 95C to their ITC Complaint further represent that “[s]ince January 1, 2019, Healthe, a wholly-owned subsidiary of LSG and licensee of the Asserted Patents [including the ’608 patent], has continued development, design, sales and support for these products.”

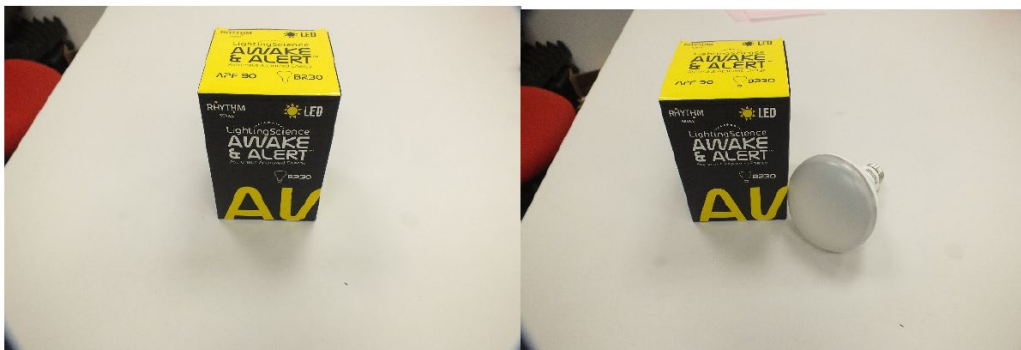
31. Prior to January 1, 2019, the Awake & Alert product was developed, designed, sold and supported by LSG. Since January 1, 2019, the Awake & Alert product has been sold and supported by Healthe, a wholly-owned subsidiary of LSG.

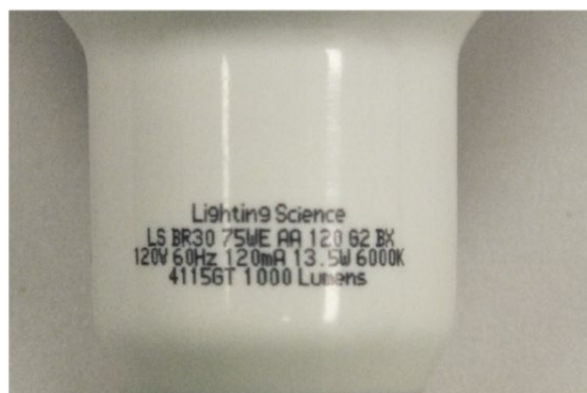
32. Prior to January 1, 2019, the Good Day product was developed, designed, sold and supported by LSG. Since January 1, 2019, the Good Day product has been sold and supported by Healthe, a wholly-owned subsidiary of LSG.

33. These allegations reflect that LSG and Healthe have engaged in concerted action with respect to at least the Sleepy Baby P15 LED Bulb, the Journi Mobile LED Task Light, the Cleanse Troffer, the SunTrac System, Awake & Alert and Good Day, and are jointly and severally liable for acts of infringement of the relevant Patents-in-Suit related to the sale, offer for sale, import and export of these Accused Product, among others.

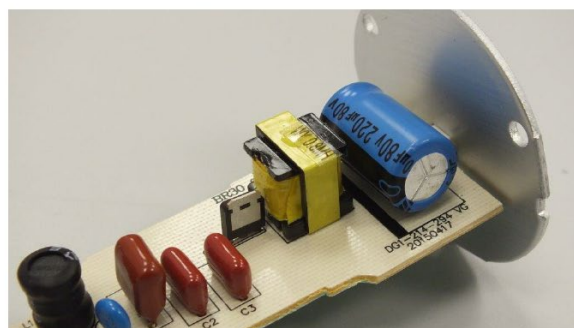
THE ACCUSED PRODUCTS

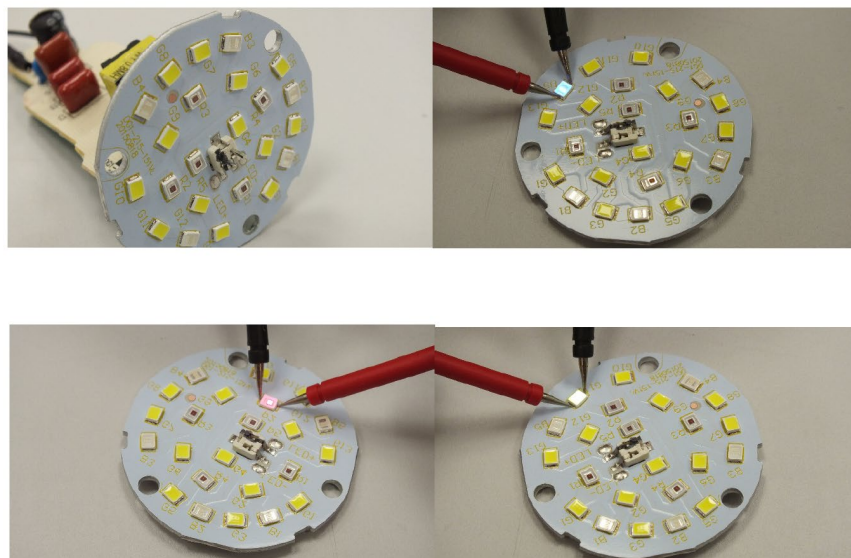
34. Representative images of the Awake & Alert BR-30 product are provided below. These images show the product next to its packaging and also a closer view of manufacturing information contained on the product:



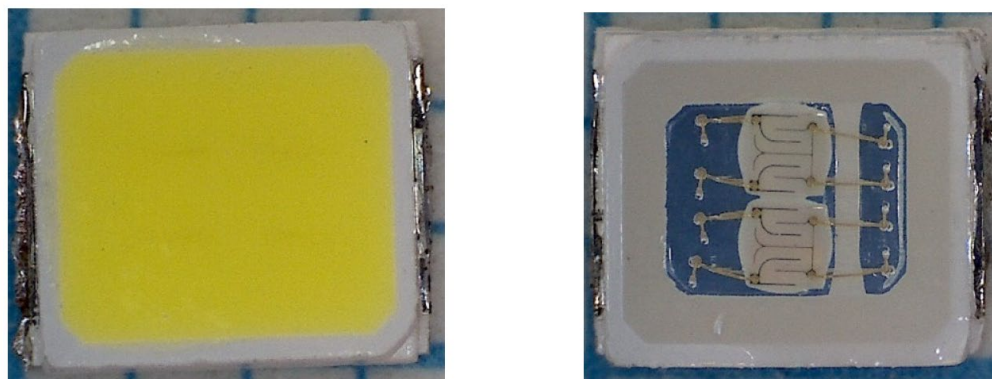


35. Images of the interior of a representative Awake & Alert BR-30 product are provided below. These images show portions of the disassembled product, including the packaged LED devices within the product:

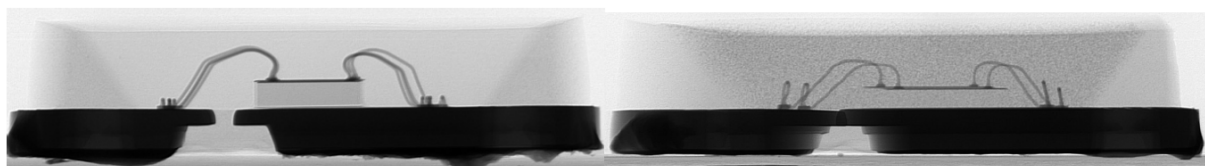




36. Microscopy images of exemplary packaged LED devices emitting yellow and bluish white light, respectively, found in the Awake & Alert BR-30 product are provided below:



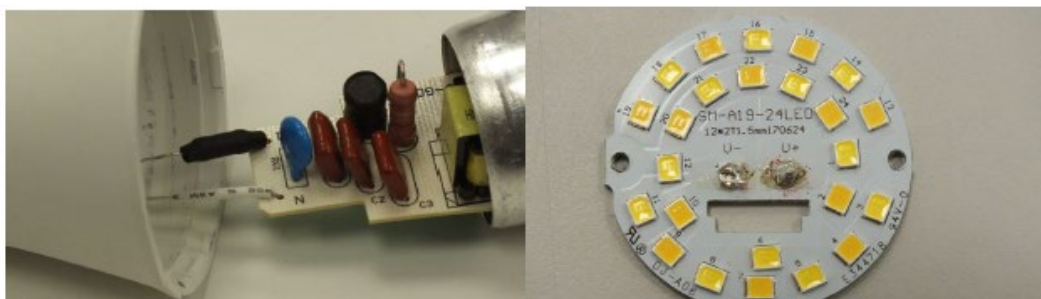
37. X-ray images of the packaged LED devices emitting yellow and bluish white light, respectively, found in the Awake & Alert BR-30 product of the representative LED devices found in the Awake & Alert BR-30 product are provided below:



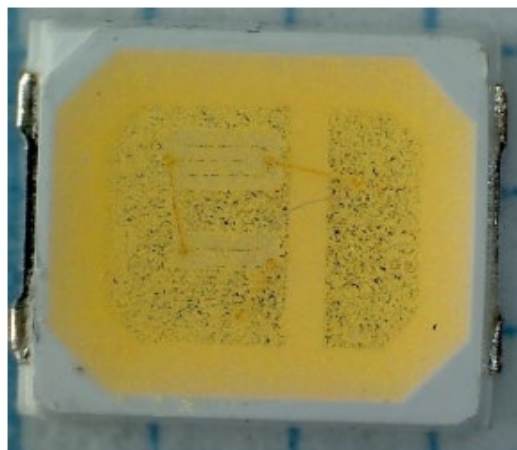
38. Images of the packaging and contents for the representative GoodDay A-19 product, including the instructions and other writing that set forth on the packaging, are provided below:



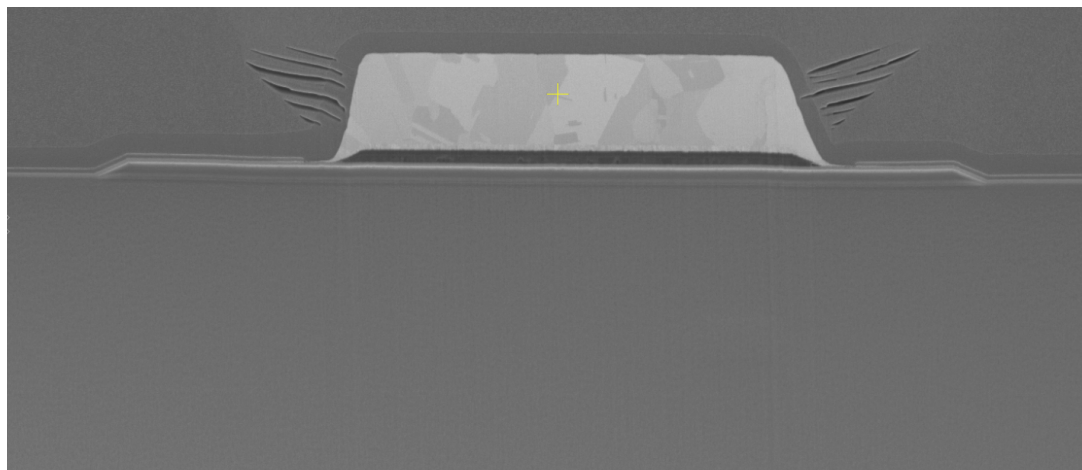
39. Representative images of the interior of the GoodDay A-19 product are provided below. These images show the disassembled product including the packaged light emitting diodes within the product:



40. A microscopic image of an exemplary packaged LED device sized 2835 and having a sedimented phosphor found in the GoodDay A-19 product is provided below:



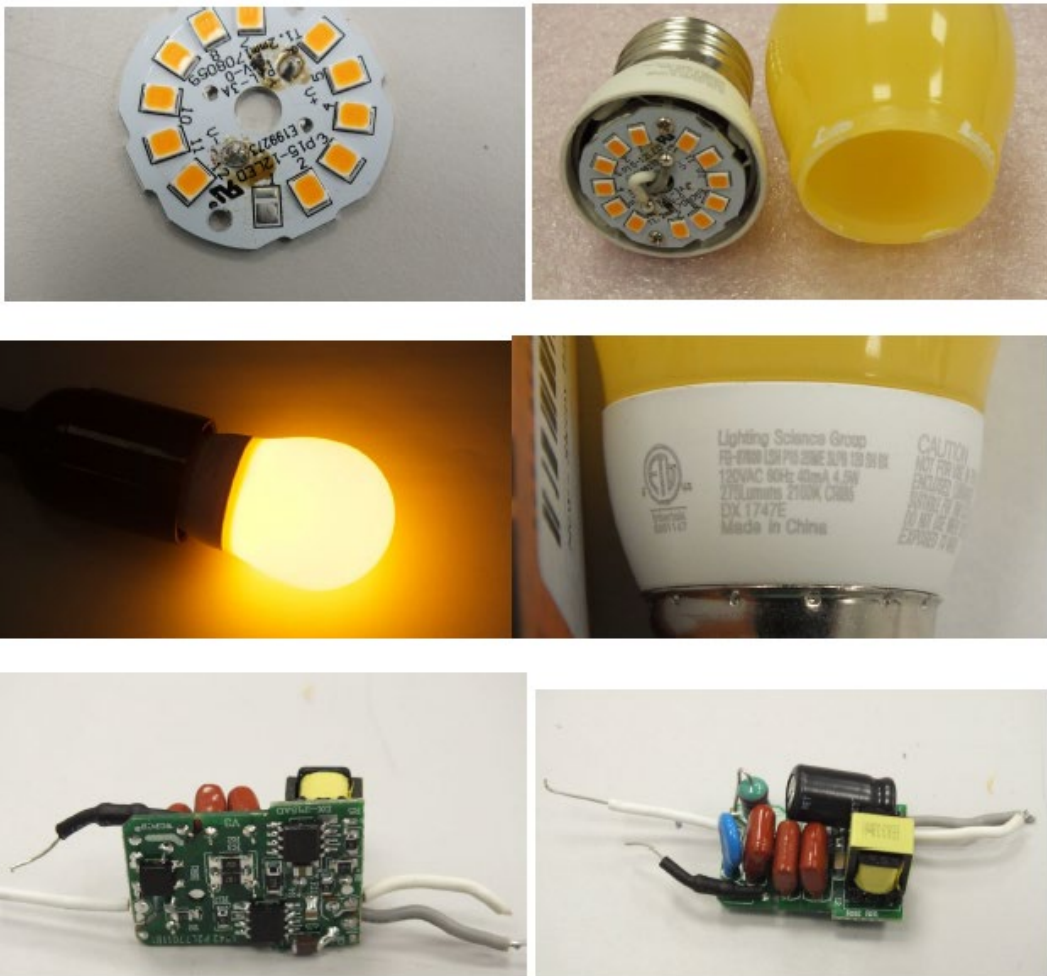
41. A scanning electron microscope image of an exemplary packaged LED device sized 2835 and having a sedimented phosphor found in the GoodDay A-19 product is provided below:



42. Images of the packaging and contents for the Sleepy Baby product are provided below:

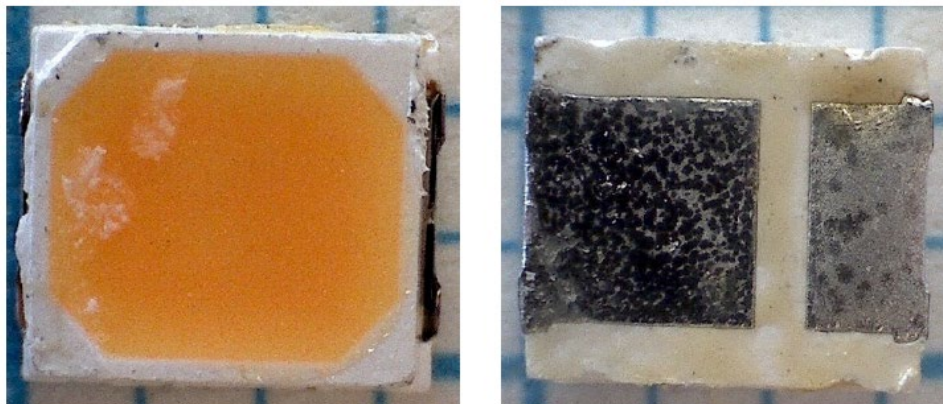


43. Images of the interior of the Sleepy Baby product are provided below. These images show the disassembled product including the packaged LED devices within the product:

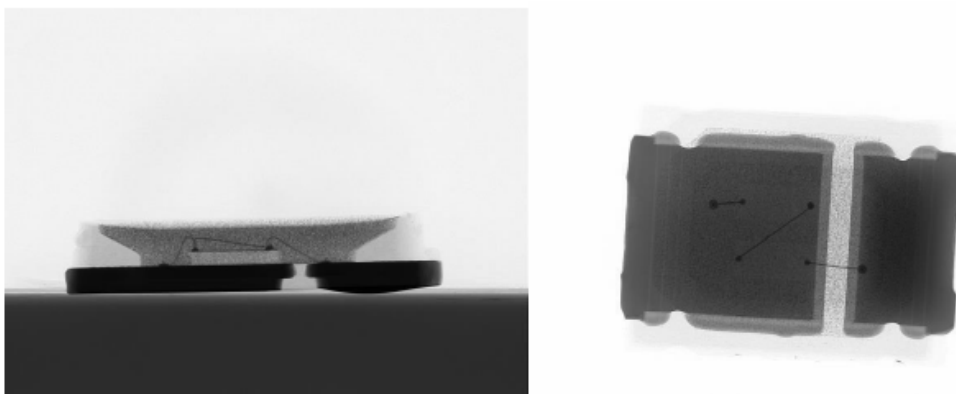


44. Upon information and believe, each of the packaged LED devices contained in the Sleepy Baby product are identical.

45. Microscopy images of an exemplary packaged LED device found in the Sleepy Baby product are provided below:

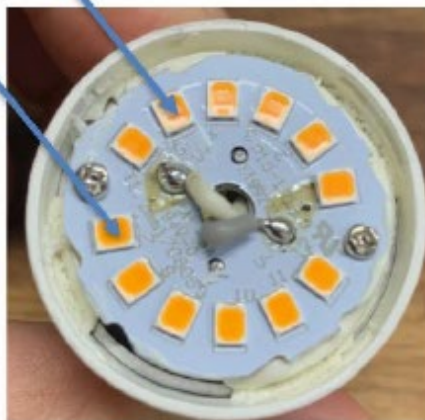


46. X-ray images of an exemplary packaged LED device found in the Sleepy Baby product are provided below, reflecting both side and bottom perspectives:



47. As reflected below, Defendants represented that various features are present in the packaged LED device found in the Sleepy Baby P15 LED Bulb in Exhibit 89C to their ITC Complaint:

SleepyBaby P15 LED Packages

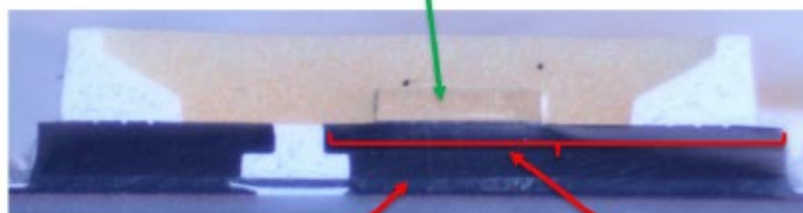


Electrically insulating layer



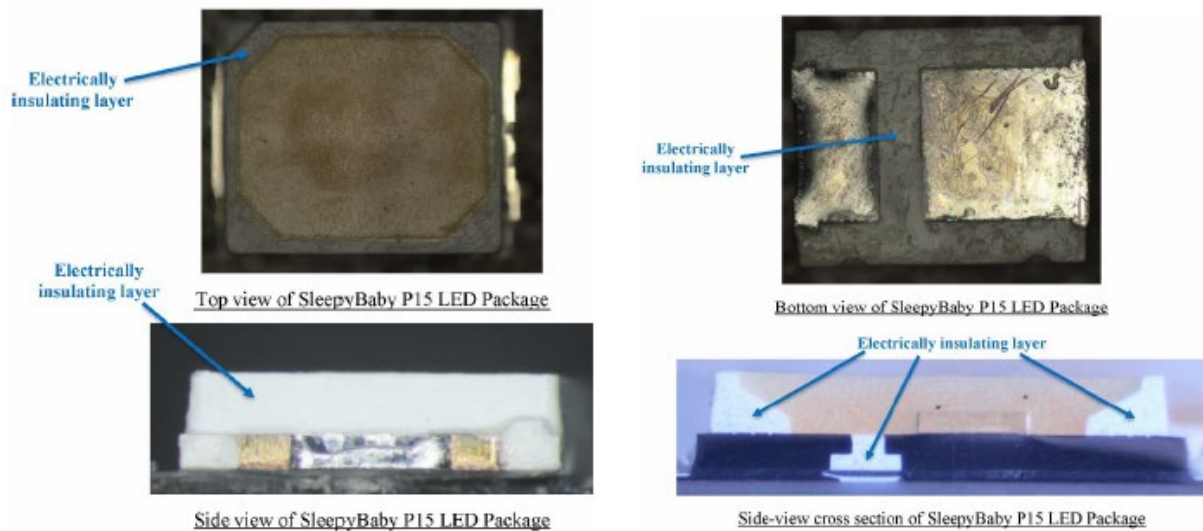
Substantially planar portion of
the thermally conducting base

LED die



Thermally conducting base

Substantially planar portion of
the thermally conducting base

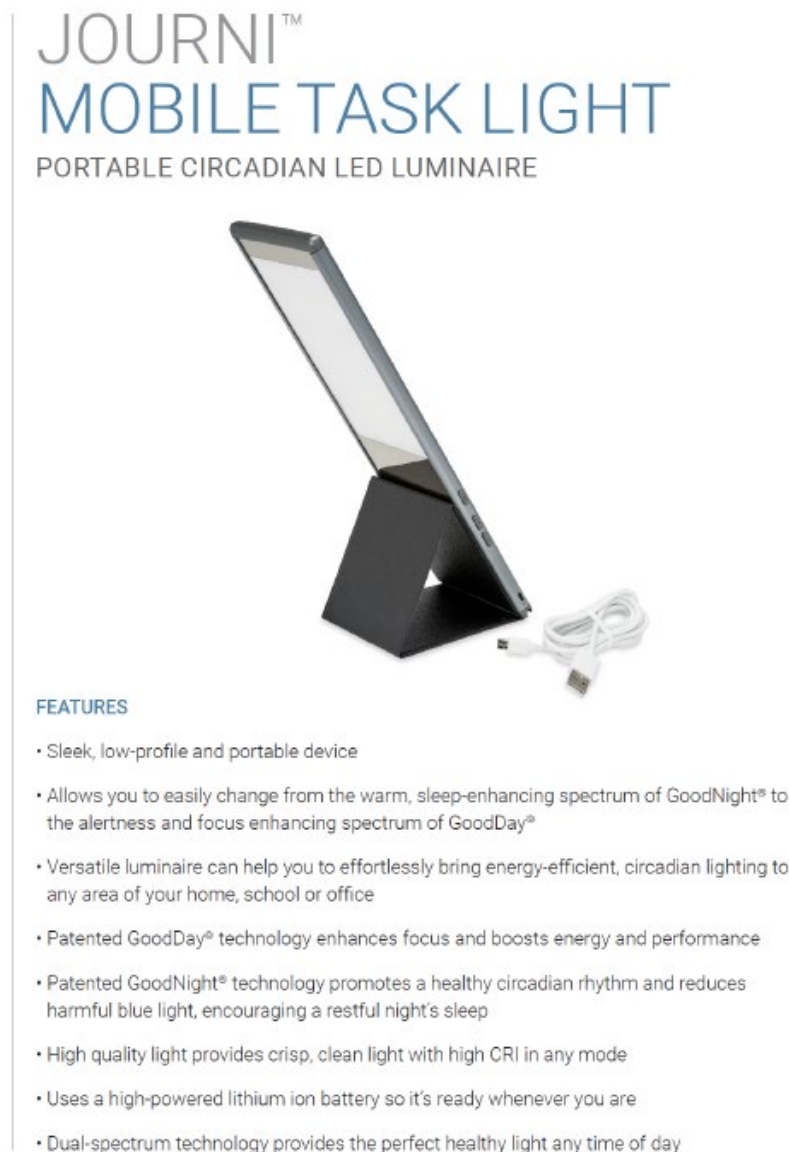


48. Upon information and belief, the packaged LED devices contained in the Sleepy Baby P15 product are substantively identical to the packaged LED devices contained in the accused Sleepy Baby product.

49. Various images of the packaging for the Journi product are set forth below:



50. On information and belief, Defendants have marketed, and continue to market, the Journi Product at least at the website with the World-Wide-Web address <https://healthelighting.com/products/journi-mobile-task-light>, which permits a website user to further access a specification sheet for the Journi device located at the World-Wide-Web address https://cdn.shopify.com/s/files/1/0774/5259/files/Healthe_Journi_Mobile_Task_Light_SpecSheet_v3.pdf?331. True and correct images of portions of the specification sheet for the Journi device available from that World-Wide-Web address is set forth below:



SPECIFICATIONS

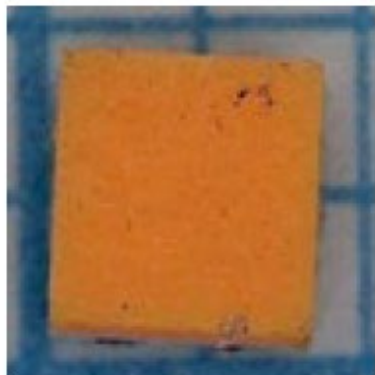
Output (Lumens)	300 lm (in GoodDay® mode, maximum intensity setting)
Light Output Mode	GoodNight® / Afternoon / GoodDay®
Color Temperature	2000K (GoodNight® mode) / 3000K (Afternoon mode) / 4500K (GoodDay® mode)
Color Rendering Index (CRI)	≤ 90
Melanopic/Photopic (M/P) Ratio	0.30–0.90 (+/-0.02)
Light Source Type	LED
Light Direction	Adjustable
Dimmable	Yes
Switch Style	Push Button
Power Source	Battery-Powered
Input	DC5V-1A
Input Wattage	5W
Input Connection Port Type	Micro USB
Fixture Body Material	Aluminum Alloy
Fixture Body Finish	Matte
Fixture Cover	Leather
Product Color	Space Gray with Black Cover
Weight	0.80 lbs
Product Dimensions (L x W x H)	11.75 x 3.40 x 0.49 in
Environment	Dry
Certification	CE, RoHS, FCC
Warranty	1 Year Limited
Package includes	Light Fixture, USB cable (MicroUSB to USB-A), User Manual

51. Additional images of the Journi product are provided below. These images show the disassembled product including the packaged LED devices within the product:

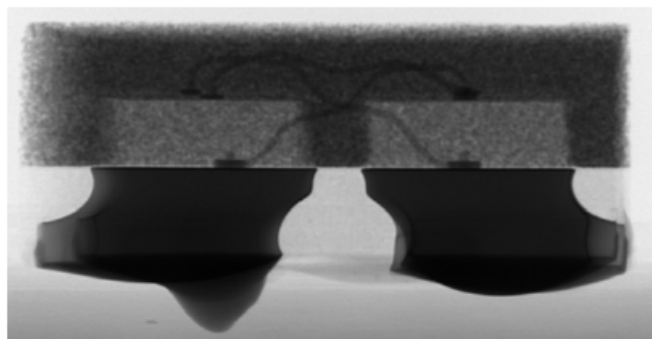
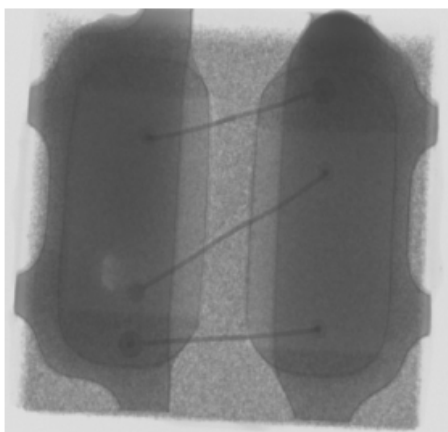




52. Microscopy images of the “flat no lead” packaged LED device found in the Journi product are provided below:



53. X-ray images of the “flat no lead” packaged LED device found in the Journi product are provided below:

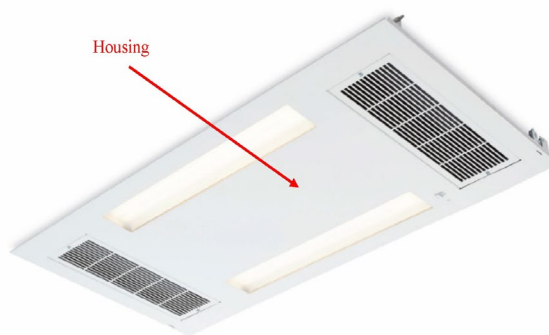


54. As reflected below, Defendants represented and illustrated what are certain of the features of the Cleanse Troffer in Exhibit 91C to the ITC Complaint:

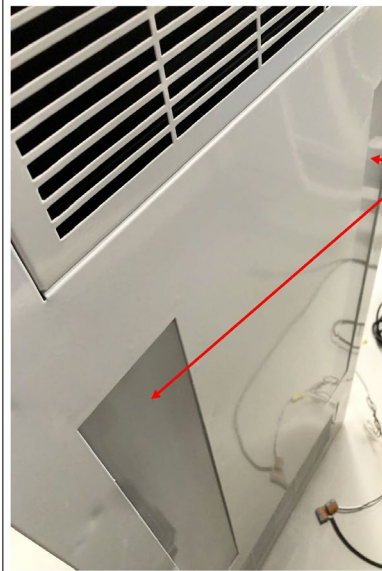
The preamble is not a limitation. To the extent the preamble is construed as a limitation the Cleanse LED Troffer is a light fixture useful for area lighting. An image of the Cleanse LED Troffer is provided below.



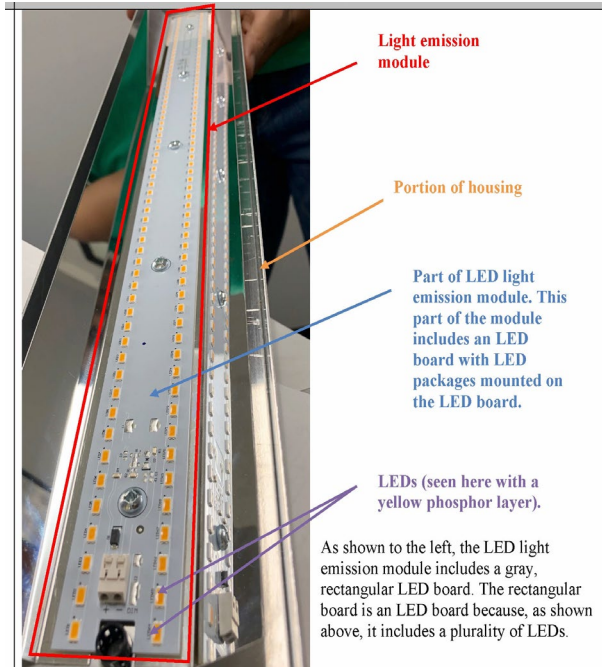
The Cleanse LED Troffer contains a housing, as shown in the image below.



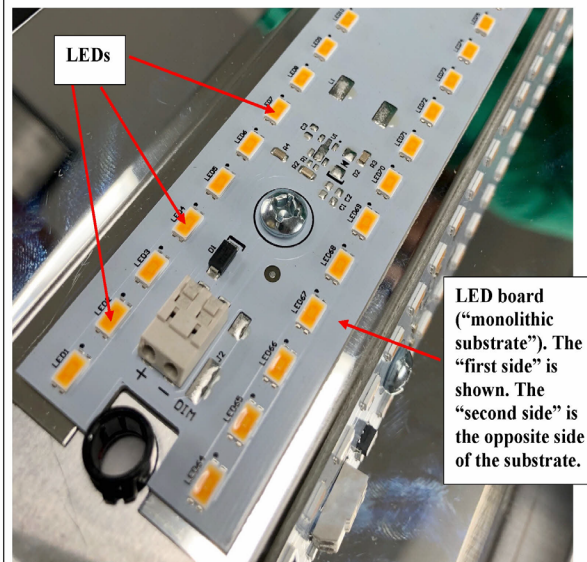
The Cleanse LED Troffer contains a light emitting diode (LED) light emission module disposed within the housing, the light emission module having an LED board. Images of the housing, both before and after being removed from the housing, are shown below.



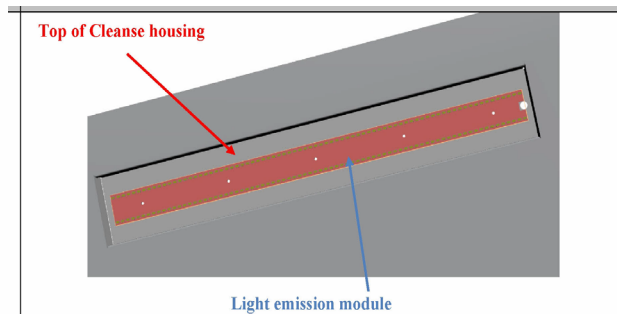
LED light emission module disposed within housing (underneath lens). When the Cleanse LED Troffer is mounted on the ceiling, this is the side facing down and emits light to the room.



The light emission module of the Cleanse LED Troffer contains a monolithic substrate having a first side and a second side. The substrate is monolithic because it is one continuous piece of material.



The side on which the LEDs are disposed (the side facing the viewer in the image above) is the "first side" of the monolithic substrate. The "second side" of the monolithic substrate is the side opposite of the LEDs, i.e., the back side.



As shown in the image above with the base of the housing hidden, the light emission module is disposed at least partially within the top of the housing.

Because the light emission module faces toward the ground when the Cleanse is mounted, the light emission module is oriented in a downward direction toward the ground.

55. As reflected below, Defendants represented and illustrated what are certain of the features of the SunTrac System in Exhibit 95C to the ITC Complaint:

The SunTrac System contains a controller including a processor and memory to analyze data and to control a light source to emit light.

The Good Day&Night® LED Downlight includes a controller, which controls the operation of the luminaire. For example, the Good Day&Night® LED Downlight includes both a processor and memory embedded within the luminaire. Specifically, the Good Day&Night® LED Downlight includes a MESHTEK-H52 Smart Mesh Module,⁴ which includes a “32-bit ARM® Cortex™ M4F nRF52832 CPU” as well as “512KB flash and 64KB RAM.” This MESHTEK-H52 Smart Mesh Module is thus the claimed “controller including a processor and memory.”

The controller of the Good Day&Night® LED Downlight analyzes data received from the SunLync™ Wireless Control Device (e.g., local time data) and controls a light source (e.g., the Good Day&Night® LED Downlight) to emit light based on that data. For example, “Lights [such as the Good Day&Night® LED Downlight] respond by generating the appropriate spectrum and intensity based on a pre-configured SunShow™, providing the right light at the right time.”⁵

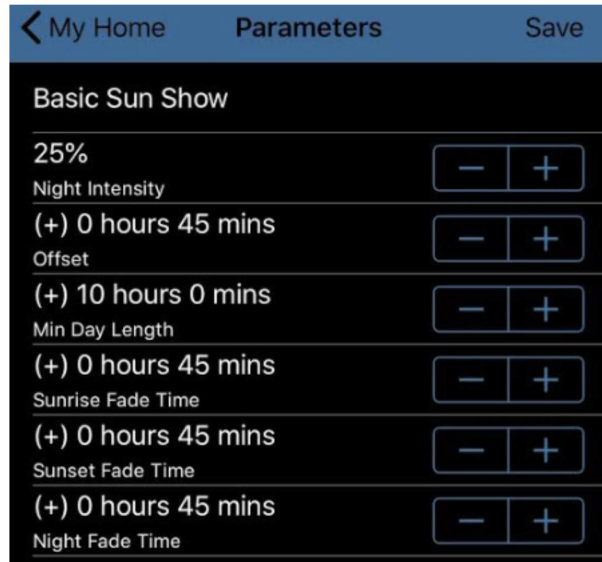
The SunTrac System has sensors in communication with the controller to detect a condition in the environment and generate the data relating to the condition, the data being transmittable to the controller for analysis.

For example, the SunLync™ Wireless Control Device has a GPS sensor that detects where the device is located, along with the date and time of day. This time/date data (i.e., the data relating to a detected condition in the environment) is transmitted to the controller within the Good Day&Night® LED Downlight for analysis.

The SunTrac System has an interface that is manipulable to cause a signal to be sent to the controller, wherein the signal relates to a state of the interface.

The SunTrac System has an interface that is manipulable to cause a signal to be sent to the controller of the SunLync™ Wireless Control Device. For example, the SunTrac™ App is an interface that is manipulable to cause a signal to be sent to the controller of the Good Day&Night® LED Downlight. In both cases, the signal relates to a state of the interface (e.g., a command to adjust the timing of spectrum changes within the Good Day&Night® LED Downlight).

An example of the interface on the SunTrac™ App is shown below, wherein a user can set the timing of the light transitions within the Good Day&Night® Downlight.



56. Based on the representations concerning Healthe made by LSG in the ITC complaint, and further based on the references to LSG on the packaging materials pictured above in paragraphs 35 to 56, Healthe products were manufactured, offered for sale, and/or sold by or on behalf of both Healthe and LSG.

COUNT I

(INFRINGEMENT OF THE BRAUNE '956 PATENT)

57. OSRAM re-alleges and incorporates the allegations of all prior paragraphs of this Complaint as if set forth in their entirety herein.

58. Defendants have infringed and continue to infringe at least claim 1 of the Braune '956 patent in violation of 35 U.S.C. § 271(a) and/or 271(g). The infringing activities include,

but are not limited to, the use, sale, importation, and/or offer for sale, without authority, of LED packages covered by the claims of the Braune '956 patent, and products incorporating such LED packages.

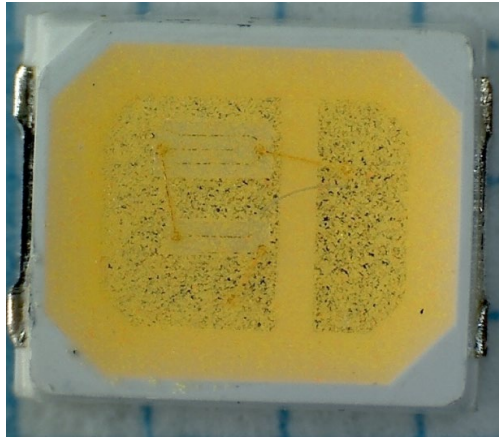
59. At least one packaged LED device in the Awake & Alert product is representative of how each of at least the Awake & Alert, Sleepy Baby and Journi devices infringe the Braune '956 patent. For example, the packaged Awake and Alert BR-30 LED device containing a yellow phosphor.

60. By way of example, in the event that the preamble of claim 1 of the Braune '956 patent is limiting, the Awake and Alert BR-30 LED device includes a combination of phosphors and a thixotropic agent (in the form of nanoparticles), i.e., a wavelength-converting reaction resin compound comprising a mixture of a wavelength-converting luminescent material and thixotropic agent, wherein the luminescent material contains inorganic luminescent particles:



61. At least part of the thixotropic agents in the Awake and Alert BR-30 LED device are in the form of nanoparticles having a d_{50} value, measured in Q3, that is greater than or equal to 5nm and less than or equal to 15nm, as required by claim 1 of the Braune '956 patent. Such thixotropic agents are evidenced by the lack of sedimentation in the phosphor. An example of

such sedimentation can be found in the packaged LED device sized 2835 found in the GoodDay A-19 product as can be seen below:



62. As a direct and proximate result of Defendants' acts of infringement as set forth in paragraphs 58 through 62 herein, of the claims of the Braune '956 patent, OSRAM has suffered and continues to suffer damages and irreparable harm. Unless Defendants' acts of infringement are enjoined by this Court, OSRAM will continue to be damaged and irreparably harmed.

63. OSRAM has no adequate remedy at law for the irreparable harm suffered as a direct and proximate result of Defendants' acts of infringement of the Braune '956 patent.

COUNT II

(INFRINGEMENT OF THE EBERHARD '191 PATENT)

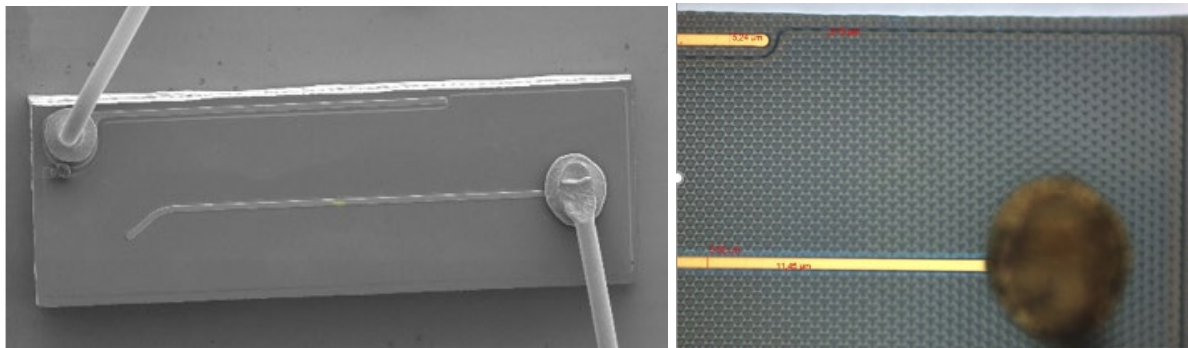
64. OSRAM re-alleges and incorporates the allegations of all prior paragraphs of this Complaint as if set forth in their entirety herein.

65. Defendants have infringed and continue to infringe at least claim 1 of the Eberhard '191 patent in violation of 35 U.S.C. § 271(a) and/or 271(g). The infringing activities include, but are not limited to, the use, sale, importation, and/or offer for sale, without authority, of LED packages that fall within the scope of the claims of the Eberhard '191 patent, and

products incorporating such LED packages, including, but not limited to, the Awake & Alert, GoodDay, and Journi products.

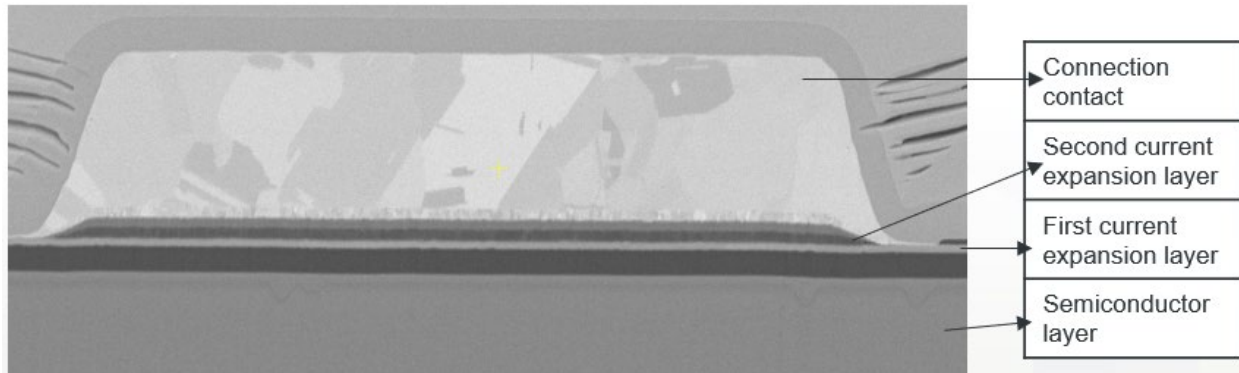
66. The packaged LED device in the Good Day product having a sedimented phosphor is representative of how each of at least the Awake & Alert, GoodDay, and Journi devices infringe the Eberhard '191 patent.

67. By way of example, in the event that the preamble of claim 1 of the Eberhard '191 patent is limiting, as reflected both by the contents of the device and scanning electron microscopy images of the product, the packaged LED device in the Good Day product having a sedimented phosphor includes an optoelectronic component having a semiconductor chip containing a semiconductor layer sequence (6) with a radiation-emitting active zone (4), the semiconductor layer sequence (6) having sidewalls (10), and a connection contact (9) for impressing current into the active zone (4):



68. As further reflected by additional Scanning Electron Microscope images at a FIB (Focused Ion Beam) cut through the p-current spreader structure below of the packaged LED device in the GoodDay product, in accordance with claim 1 of the Eberhard '191 patent, the packaged LED device in the GoodDay having a sedimented phosphor is an optoelectronic component wherein a first current expansion layer (7) adjoining a semiconductor layer (5) of the semiconductor layer sequence (6) and a second current expansion layer (8) are arranged between

the semiconductor layer sequence (6) and the connection contact (9), the first current expansion layer (7) having a larger sheet resistance than the second current expansion layer (8) and forming an ohmic contact with the adjoining semiconductor layer (5), and the second current expansion layer (8) being applied to a partial region of the first current expansion layer (7) which is at a distance from the sidewalls (10):



69. As a direct and proximate result of Defendants' acts of infringement of the claims of the Eberhard '191 patent as set forth in paragraphs 65 to 69 herein, OSRAM has suffered and continues to suffer damages and irreparable harm. Unless Defendants' acts of infringement are enjoined by this Court, OSRAM will continue to be damaged and irreparably harmed.

70. OSRAM has no adequate remedy at law for the irreparable harm suffered as a direct and proximate result of Defendants' acts of infringement of the Eberhard '191 patent.

COUNT III

(INFRINGEMENT OF THE JAEGER '282 PATENT)

71. OSRAM re-alleges and incorporates the allegations of all prior paragraphs of this Complaint as if set forth in their entirety herein.

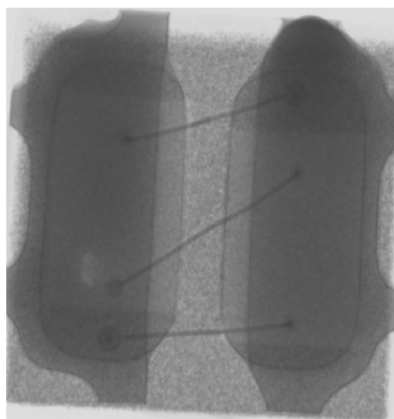
72. Defendants have infringed and continue to infringe at least claim 1 of the Jaeger '282 patent in violation of 35 U.S.C. § 271(a) and/or 271(g). The infringing activities include,

but are not limited to, the use, sale, importation, and/or offer for sale, without authority, of LED packages that fall within the scope of the claims of the Jaeger '282 patent, and products incorporating such light emitting devices, including, but not limited to, the “flat no lead” packaged LED device in the Journi product.

73. By way of example, in the event that the preamble of claim 1 of the Jaeger '282 patent is limiting, as reflected by the contents of the device, the “flat no lead” packaged LED device in the Journi product includes an optoelectronic component:

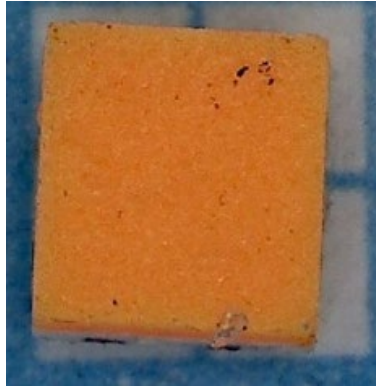


74. The “flat no lead” packaged LED device in the Journi product, in accordance with claim 1 of the Jaeger '282 patent, includes a cavity-free connection carrier comprising a structured carrier strip in which interspaces are filled with an electrically insulating material:

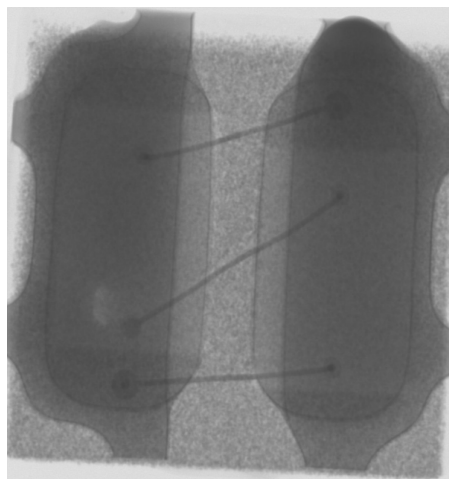


75. The “flat no lead” packaged LED device in the Journi product, in accordance with claim 1 of the Jaeger '282 patent, includes an optoelectronic semiconductor chip attached and

electrically connected to a top portion of the connection carrier, wherein the electrically insulating material terminates substantially flush with the carrier strip in places or the carrier strip projects beyond the electrically insulating material:

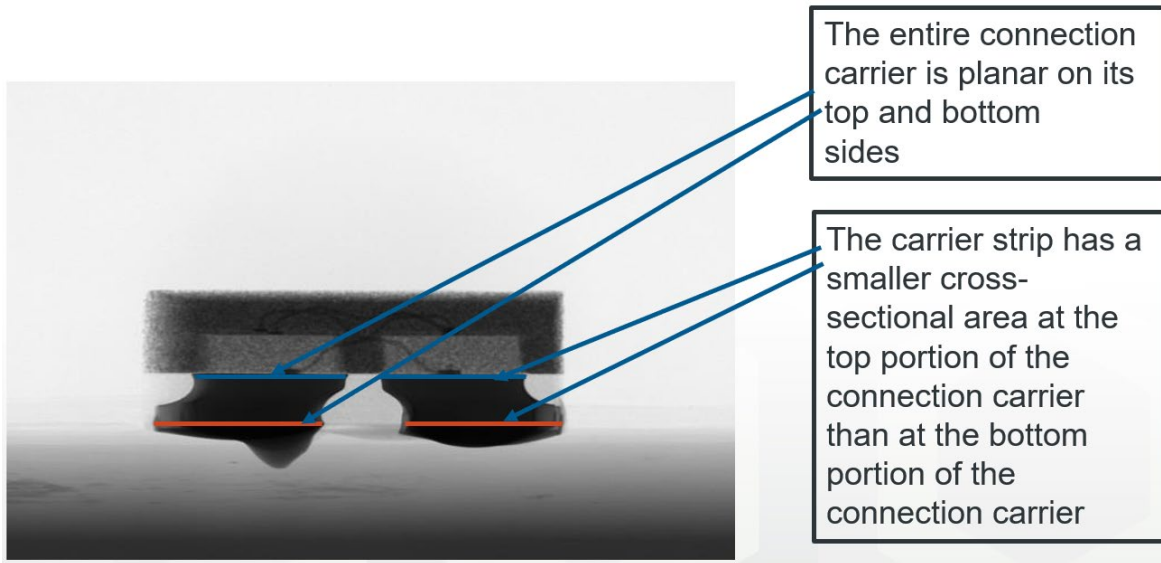


76. As reflected in x-ray images, the light emitting LED chips in the “flat no lead” packaged LED device in the Journi product, in accordance with claim 1 of the Jaeger ’282 patent, include a carrier strip that is not covered by the electrically insulating material on the top portion and on a bottom portion of the connection carrier, and in which the carrier strip is a lead frame which consists of an electrically conductive material:



77. As reflected by x-ray images of the “flat no lead” packaged LED device in the Journi product, in accordance with claim 1 of the Jaeger ’282 patent, the entire connection carrier

is planar on its top and bottom sides, and the carrier strip has a smaller cross-sectional area at the top portion of the connection carrier than at the bottom portion of the connection carrier:



78. As a direct and proximate result of Defendants' acts of infringement of the claims of the Jaeger '282 patent as set forth in paragraphs 72 to 78 herein, OSRAM has suffered and continues to suffer damages and irreparable harm. Unless Defendants' acts of infringement are enjoined by this Court, OSRAM will continue to be damaged and irreparably harmed.

79. OSRAM has no adequate remedy at law for the irreparable harm suffered as a direct and proximate result of Defendants' acts of infringement of the Jaeger '282 patent.

COUNT IV

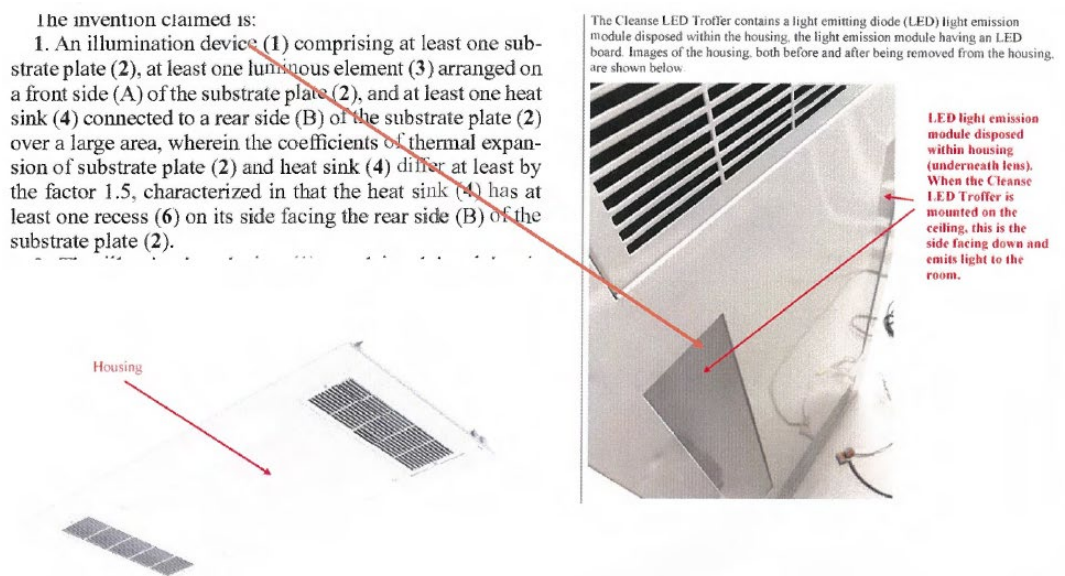
(INFRINGEMENT OF THE KRAUS '146 PATENT)

80. OSRAM re-alleges and incorporates the allegations of all prior paragraphs of this Complaint as if set forth in their entirety herein.

81. Defendants have infringed and continue to infringe at least claim 1 of the Kraus '146 patent in violation of 35 U.S.C. § 271(a) and/or 271(g). The infringing activities include,

but are not limited to, the use, sale, importation, and/or offer for sale, without authority, of light emitting devices that are made by a process that falls within the scope of the claims of the Kraus '146 patent, and products incorporating such light emitting devices, including, but not limited to, the Cleanse Troffer product.

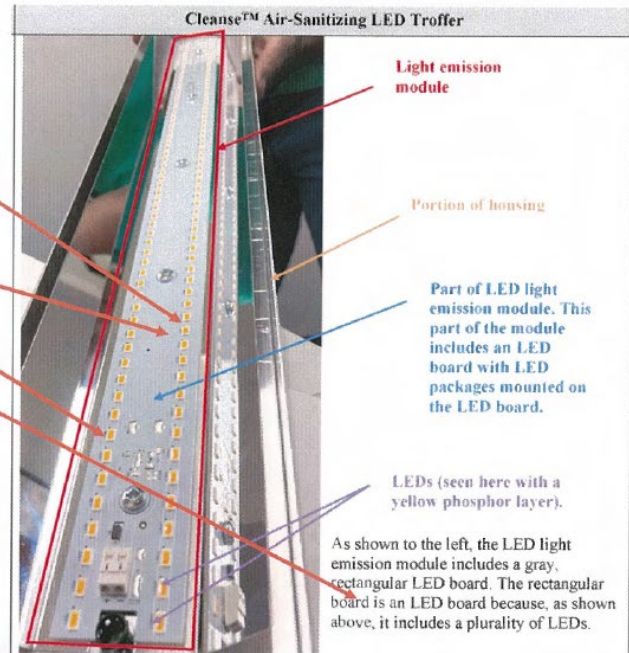
82. By way of example, in the event that the preamble of claim 1 of the Kraus '146 patent is limiting, as reflected by the representations of the Defendants from the ITC complaint, the Cleanse Troffer product includes an illumination device as annotated in the image below:



83. As reflected by Defendants' representations from the ITC complaint, the illumination device included within Cleanse Troffer product, in accordance with claim 1 of the Kraus '146 patent, the illumination device comprises at least one substrate plate (2), at least one luminous element (3) arranged on a front side (A) of the substrate plate (2), and at least one heat sink (4) connected to a rear side (B) of the substrate plate (2) over a large area as annotated in the image below:

The invention claimed is:

1. An illumination device (1) comprising at least one substrate plate (2), at least one luminous element (3) arranged on a front side (A) of the substrate plate (2), and at least one heat sink (4) connected to a rear side (B) of the substrate plate (2) over a large area, wherein the coefficients of thermal expansion of substrate plate (2) and heat sink (4) differ at least by the factor 1.5, characterized in that the heat sink (4) has at least one recess (6) on its side facing the rear side (B) of the substrate plate (2).

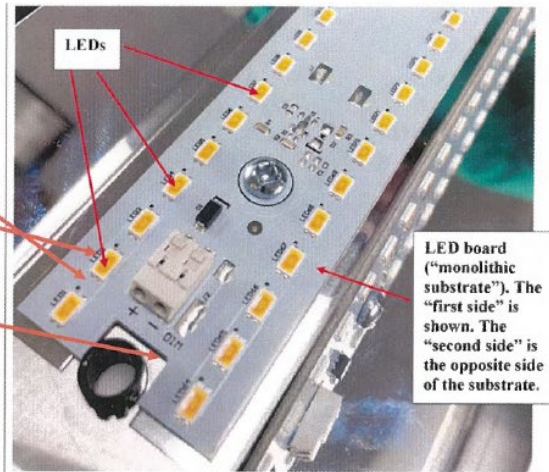


84. As reflected by Defendants' representations from the ITC complaint, the illumination device included within the Cleanse Troffer product, in accordance with claim 1 of the Kraus '146 patent, in the illumination device the coefficients of thermal expansion of substrate plate (2) and heat sink (4) differ at least by the factor 1.5, characterized in that the heat sink (4) has at least one recess (6) on its side facing the rear side (B) of the substrate plate (2) as

annotated in the image below:

The invention claimed is:

1. An illumination device (1) comprising at least one substrate plate (2), at least one luminous element (3) arranged on a front side (A) of the substrate plate (2), and at least one heat sink (4) connected to a rear side (B) of the substrate plate (2) over a large area, wherein the coefficients of thermal expansion of substrate plate (2) and heat sink (4) differ at least by the factor 1.5, characterized in that the heat sink (4) has at least one recess (6) on its side facing the rear side (B) of the substrate plate (2).



The side on which the LEDs are disposed (the side facing the viewer in the image above) is the "first side" of the monolithic substrate. The "second side" of the monolithic substrate is the side opposite of the LEDs, i.e., the back side.

85. As a direct and proximate result of Defendants' acts of infringement of the claims of the Kraus '146 patent as set forth in paragraphs 81 to 85 herein, OSRAM has suffered and continues to suffer damages and irreparable harm. Unless Defendants' acts of infringement are enjoined by this Court, OSRAM will continue to be damaged and irreparably harmed.

86. OSRAM has no adequate remedy at law for the irreparable harm suffered as a direct and proximate result of Defendants' acts of infringement of the Kraus '146 patent. patent.

COUNT V

(INFRINGEMENT OF THE DE ANNA '734 PATENT)

87. OSRAM re-alleges and incorporates the allegations of all prior paragraphs of this Complaint as if set forth in their entirety herein.

88. Defendants have infringed and continue to infringe at least claim 1 of the De Anna '734 patent in violation of 35 U.S.C. § 271(a) and/or 271(g). The infringing activities include, but are not limited to, the use, sale, importation, and/or offer for sale, without authority, of light emitting devices that are made by a process that falls within the scope of the claims of

the De Anna '734 patent, and products incorporating such light emitting devices, including, but not limited to, the Journi product.

89. By way of example, in the event that the preamble of claim 1 of the De Anna '734 patent is limiting, the Journi product operates using a method for powering a light source at selectable brightness levels over a dimming range:

A method for powering a light source at selectable brightness levels over a dimming range, the method comprising the steps of:

SPECIFICATIONS

Output (Lumens)	300 lm (In GoodDay® mode, maximum intensity setting)
Light Output Mode	GoodNight® / Afternoon / GoodDay®
Color Temperature	2000K (GoodNight® mode) / 3000K (Afternoon mode) / 4500K (GoodDay® mode)
Color Rendering Index (CRI)	≥ 90
Melanopic/Photopic (M/P) Ratio	0.30–0.90 (4:1–6:02)
Light Source Type	LED
Light Direction	Adjustable
Dimmable	Yes
Switch Style	Push Button
Power Source	Battery-Powered
Input	DC5V-1A
Input Wattage	5W
Input Connection Port Type	Micro USB
Fixture Body Material	Aluminum Alloy
Fixture Body Finish	Matte
Fixture Cover	Leather
Product Color	Space Gray with Black Cover
Weight	0.80 lbs
Product Dimensions (L x W x H)	11.75 x 3.40 x 0.49 in
Environment	Dry
Certification	CE, RoHS, FCC
Warranty	1 Year Limited
Package includes	Light Fixture, USB cable (MicroUSB to USB-A), User Manual

90. The Journi product, as required by claim 1 of the De Anna '734 patent, partitions the dimming range (0% -100%) into a plurality of portions, and feeding a current to the light source in dependence upon both: (a) a selected brightness level, wherein, for a selected

brightness level that is within at least one of the portions of the dimming range:

SPECIFICATIONS

Output (Lumens)	300 lm (in GoodDay® mode, maximum intensity setting)
Light Output Mode	GoodNight® / Afternoon / GoodDay®
Color Temperature	2000K (GoodNight® mode) / 3000K (Afternoon mode) / 4500K (GoodDay® mode)
Color Rendering Index (CRI)	≥ 90
Melanopic/Photopic (M/P) Ratio	0.30–0.90 (+/-0.02)
Light Source Type	LED
Light Direction	Adjustable
Dimmable	Yes
Switch Style	Push Button
Power Source	Battery-Powered
Input	DC5V-1A
Input Wattage	5W
Input Connection Port Type	Micro USB
Fixture Body Material	Aluminum Alloy
Fixture Body Finish	Matte
Fixture Cover	Leather
Product Color	Space Gray with Black Cover
Weight	0.80 lbs
Product Dimensions (L x W x H)	11.75 x 3.40 x 0.49 in
Environment	Dry
Certification	CE, RoHS, FCC
Warranty	1 Year Limited
Package Includes	Light Fixture, USB cable (Micro USB to USB-A), User Manual

partitioning the dimming range (0%-100%) into a plurality of portions; and

feeding a current to the light source in dependence upon both: (a) a selected brightness level; and (b) the portion of the dimming range corresponding to the selected brightness level, wherein, for a selected brightness level that is within at least one of the plurality of portions of the dimming range:

JOURNI™ MOBILE TASK LIGHT

PORTABLE CIRCADIAN LED LUMINAIRE



FEATURES

- Sleek, low-profile and portable device
- Allows you to easily change from the warm, sleep-enhancing spectrum of GoodNight® to the alertness and focus enhancing spectrum of GoodDay®
- Versatile luminaire can help you to effortlessly bring energy-efficient, circadian lighting to any area of your home, school or office
- Patented GoodDay® technology enhances focus and boosts energy and performance
- Patented GoodNight® technology promotes a healthy circadian rhythm and reduces harmful blue light, encouraging a restful night's sleep
- High quality light provides crisp, clean light with high CRI in any mode
- Uses a high-powered lithium ion battery so it's ready whenever you are
- Dual-spectrum technology provides the perfect healthy light any time of day

partitioning the dimming range (0%-100%) into a plurality of portions; and

feeding a current to the light source in dependence upon both: (a) a selected brightness level; and (b) the portion of the dimming range corresponding to the selected brightness level, wherein, for a selected brightness level that is within at least one of the plurality of portions of the dimming range:

91. In the Journi product, as required by claim 1 of the De Anna '734 patent, (i) the current fed to the light source is a discontinuous, switched current that is switched at a duty cycle between an on value and an off value; and (ii) the on value is a fraction of a rated current for the light source, and is adjusted in dependence upon the selected brightness level.

SPECIFICATIONS

Output (Lumens)	300 lm (in GoodDay® mode, maximum intensity setting)
Light Output Mode	GoodNight® / Afternoon / GoodDay®
Color Temperature	2000K (GoodNight® mode) / 3000K (Afternoon mode) / 4500K (GoodDay® mode)
Color Rendering Index (CRI)	≥ 90
Melanopic/Photopic (M/P) Ratio	0.30–0.90 (+/-0.02)
Light Source Type	LED
Light Direction	Adjustable
Dimmable	Yes
Switch Style	Push Button
Power Source	Battery Powered
Input	DC5V-1A
Input Wairage	5W
Input Connection Port Type	Micro USB
Fixture Body Material	Aluminum Alloy
Fixture Body Finish	Matte
Fixture Cover	Leather
Product Color	Space Gray with Black Cover
Weight	0.80 lbs
Product Dimensions (L x W x H)	11.75 x 3.40 x 0.49 in
Environment	Dry
Certification	CE, RoHS, FCC
Warranty	1 Year Limited
Package includes	Light Fixture, USB cable (MicroUSB to USB-A), User Manual

(i) the current fed to the light source is a discontinuous, switched current that is switched at a duty cycle between an on value and an off value; and
(ii) the on value is a fraction of a rated current for the light source, and is adjusted in dependence upon the selected brightness level.

92. As a direct and proximate result of Defendants' acts of infringement of the claims of the De Anna '734 patent as set forth in paragraphs 88 to 92 herein, OSRAM has suffered and

continues to suffer damages and irreparable harm. Unless Defendants' acts of infringement are enjoined by this Court, OSRAM will continue to be damaged and irreparably harmed.

93. OSRAM has no adequate remedy at law for the irreparable harm suffered as a direct and proximate result of Defendants' acts of infringement of the De Anna '734 patent.

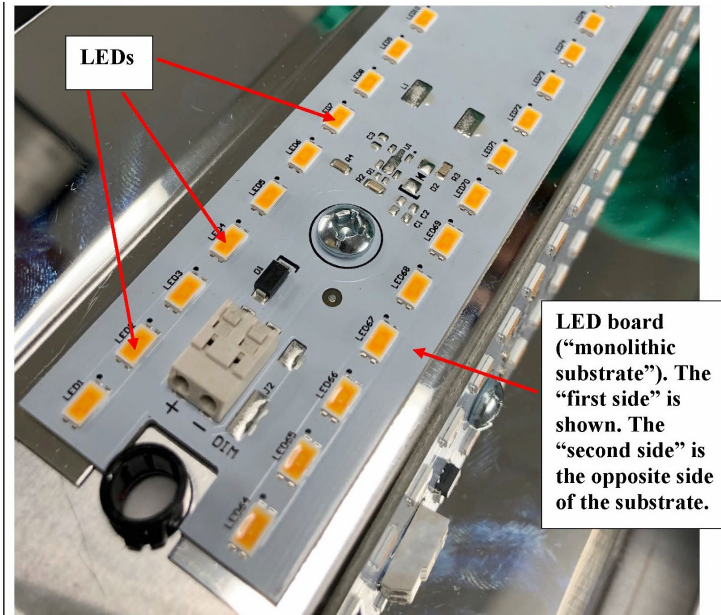
COUNT VI

(INFRINGEMENT OF THE ARNDT '819 PATENT)

94. OSRAM re-alleges and incorporates the allegations of all prior paragraphs of this Complaint as if set forth in their entirety herein.

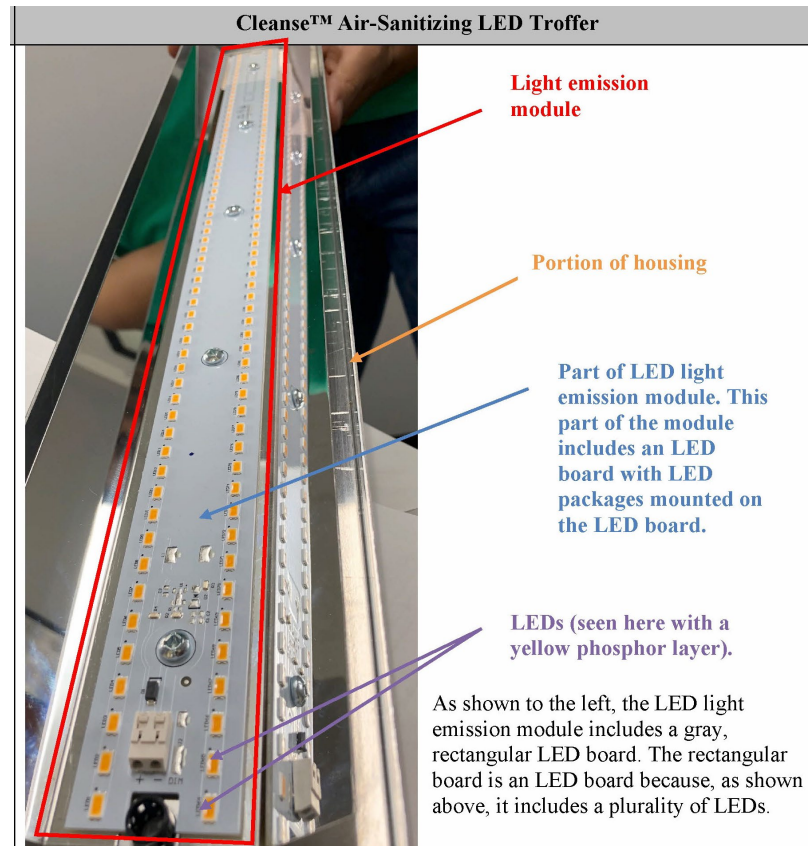
95. Defendants have infringed and continue to infringe at least claim 1 of the Arndt '819 patent in violation of 35 U.S.C. § 271(a) and/or 271(g). The infringing activities include, but are not limited to, the use, sale, importation, and/or offer for sale, without authority, of products that fall within the scope of the claims of the Arndt '819 patent, including, but not limited to, the Cleanse Troffer product.

96. By way of example, in the event that the preamble of claim 1 of the Arndt '819 patent is limiting, as reflected by the representations of the Defendants from the ITC complaint, the Cleanse Troffer product includes a surface-mounted LED arrangement, comprising a printed circuit board having a principal surface and a secondary surface, said printed circuit board comprising a plastic material, with a plurality of LEDs arranged on the principal surface, with a metallic layer provided on said secondary surface that is electrically insulated from said plurality of LEDs:



The side on which the LEDs are disposed (the side facing the viewer in the image above) is the "first side" of the monolithic substrate. The "second side" of the monolithic substrate is the side opposite of the LEDs, i.e., the back side.

97. As reflected by Defendants' representations from the ITC complaint, the surface mounted LED arrangement included within Cleanse Troffer product, in accordance with claim 1 of the Arndt '819 patent, also comprises a cooling member connected to said secondary surface, wherein said printed circuit board is secured to said cooling member with at least one of a thermally conductive paste, a thermally conductive adhesive and a thermally conductive film, and wherein said secondary surface is applied to a target surface that is at least one of a curved surface, a singly angled surface comprising at least two planes that are not co-planar, and a multiply angled surface of: a) said cooling member, b) a thermally conductive partial region of a device housing, or c) an automobile chassis, such that said plurality of LEDs are arranged in a spatial form determined by said target surface.



98. As a direct and proximate result of Defendants' acts of infringement of the claims of the Arndt '819 patent as set forth in paragraphs 95 to 98 herein, OSRAM has suffered and continues to suffer damages and irreparable harm. Unless Defendants' acts of infringement are enjoined by this Court, OSRAM will continue to be damaged and irreparably harmed.

99. OSRAM has no adequate remedy at law for the irreparable harm suffered as a direct and proximate result of Defendants' acts of infringement of the Arndt '819 patent. patent.

COUNT VII

(INFRINGEMENT OF THE CHEMEL '392 PATENT)

100. OSRAM re-alleges and incorporates the allegations of all prior paragraphs of this Complaint as if set forth in their entirety herein.

101. Defendants have infringed and continue to infringe at least claim 1 of the Chemel '392 patent in violation of 35 U.S.C. § 271(a) and/or 271(g). The infringing activities include, but are not limited to, the use, sale, importation, and/or offer for sale, without authority, of light emitting devices that are made by a process that falls within the scope of the claims of the Chemel '392 patent, and products incorporating such light emitting devices, including, but not limited to, the SunTrac System.

102. By way of example, in the event that the preamble of claim 1 of the Chemel '392 patent is limiting, as reflected by the representations of the Defendants from the ITC complaint, the SunTrac System includes an apparatus for controlling at least one digital control ready (DCR) lighting fixture, the apparatus comprising at least one sensor to provide at least one sensor signal representative of the at least one change in the environment:

The SunTrac System is a system (e.g., the SunLync™ Wireless Control Device, SunTrac™ App, and Good Day&Night® LED Downlight) for controlling a luminaire (e.g., the Good Day&Night® LED Downlight). For example, the SunLync™ provides time and geolocation to the processor of the Good Day&Night® LED Downlight, which uses that information to control the luminaire, as shown below.

As noted in the SunLync™ Wireless Control Device press release: “SunLync contains a GPS locator that captures local time and continuously broadcasts a system-wide mesh command to all Healthe lights within range. Lights respond by generating the appropriate spectrum and intensity, providing the right light at the right time. The frequent time signal generation from SunLync allows for a subtle response and fluid transition between light settings from the luminaires.”³

The SunTrac System contains a controller including a processor and memory to analyze data and to control a light source to emit light.

The Good Day&Night® LED Downlight includes a controller, which controls the operation of the luminaire. For example, the Good Day&Night® LED Downlight includes both a processor and memory embedded within the luminaire. Specifically, the Good Day&Night® LED Downlight includes a MESHTEK-H52 Smart Mesh Module,⁴ which includes a “32-bit ARM® Cortex™ M4F nRF52832 CPU” as well as “512KB flash and 64KB RAM.” This MESHTEK-H52 Smart Mesh Module is thus the claimed “controller including a processor and memory.”

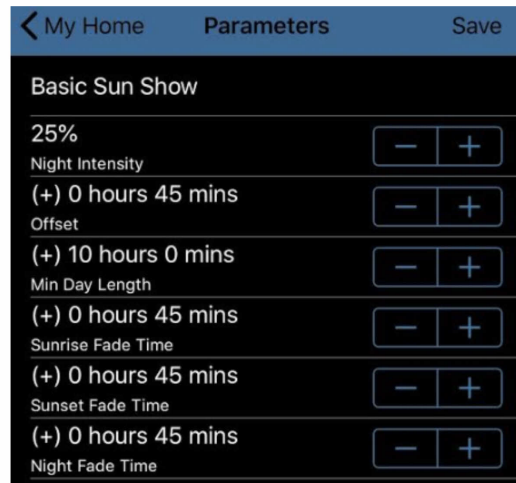
The controller of the Good Day&Night® LED Downlight analyzes data received from the SunLync™ Wireless Control Device (e.g., local time data) and controls a light source (e.g., the Good Day&Night® LED Downlight) to emit light based on that data. For example, “Lights [such as the Good Day&Night® LED Downlight] respond by generating the appropriate spectrum and intensity based on a pre-configured SunShow™, providing the right light at the right time.”⁵

103. As further reflected by Defendants’ representations from the ITC complaint, the apparatus for controlling at least one digital ready control ready lighting fixture in the SunTrac System, in accordance with claim 1 of the Chemel ’392 patent, also comprises a memory to store at least one rule governing a change in the variable illumination provided by the at least one DCR lighting fixture based at least in part on the at least one change in the environment; and a processor, operably coupled to the at least one sensor and to the memory, to generate the at least one digital control signal based on the at least one rule and the at least one sensor signal:

The SunTrac System has an interface that is manipulable to cause a signal to be sent to the controller, wherein the signal relates to a state of the interface.

The SunTrac System has an interface that is manipulable to cause a signal to be sent to the controller of the SunLync™ Wireless Control Device. For example, the SunTrac™ App is an interface that is manipulable to cause a signal to be sent to the controller of the Good Day&Night® LED Downlight. In both cases, the signal relates to a state of the interface (e.g., a command to adjust the timing of spectrum changes within the Good Day&Night® LED Downlight).

An example of the interface on the SunTrac™ App is shown below, wherein a user can set the timing of the light transitions within the Good Day&Night® Downlight.



104. As further reflected by Defendants' representations from the ITC complaint, the apparatus for controlling at least one digital ready control ready lighting fixture in the SunTrac System, in accordance with claim 1 of the Chemel '392 patent, also comprises an input/output bus, operably coupled to the processor, to receive the at least one digital reporting signal and direct current (DC) power from the at least one DCR lighting fixture and to provide the at least one digital control signal to the at least one DCR lighting fixture and to at least one other DCR lighting fixture serially coupled to the at least one DCR lighting fixture:

The SunTrac System contains a controller including a processor and memory to analyze data and to control a light source to emit light.

The Good Day&Night® LED Downlight includes a controller, which controls the operation of the luminaire. For example, the Good Day&Night® LED Downlight includes both a processor and memory embedded within the luminaire. Specifically, the Good Day&Night® LED Downlight includes a MESHTEK-H52 Smart Mesh Module,⁴ which includes a “32-bit ARM® Cortex™ M4F nRF52832 CPU” as well as “512KB flash and 64KB RAM.” This MESHTEK-H52 Smart Mesh Module is thus the claimed “controller including a processor and memory.”

The controller of the Good Day&Night® LED Downlight analyzes data received from the SunLync™ Wireless Control Device (e.g., local time data) and controls a light source (e.g., the Good Day&Night® LED Downlight) to emit light based on that data. For example, “Lights [such as the Good Day&Night® LED Downlight] respond by generating the appropriate spectrum and intensity based on a pre-configured SunShow™, providing the right light at the right time.”⁵

The SunTrac System has sensors in communication with the controller to detect a condition in the environment and generate the data relating to the condition, the data being transmittable to the controller for analysis.

For example, the SunLync™ Wireless Control Device has a GPS sensor that detects where the device is located, along with the date and time of day. This time/date data (i.e., the data relating to a detected condition in the environment) is transmitted to the controller within the Good Day&Night® LED Downlight for analysis.

105. As a direct and proximate result of Defendants’ acts of infringement of the claims of the Chemel ’392 patent as set forth in paragraphs 101 to 105 herein, OSRAM has suffered and continues to suffer damages and irreparable harm. Unless Defendants’ acts of infringement are enjoined by this Court, OSRAM will continue to be damaged and irreparably harmed.

106. OSRAM has no adequate remedy at law for the irreparable harm suffered as a direct and proximate result of Defendants’ acts of infringement of the Chemel ’392 patent.

COUNT VIII

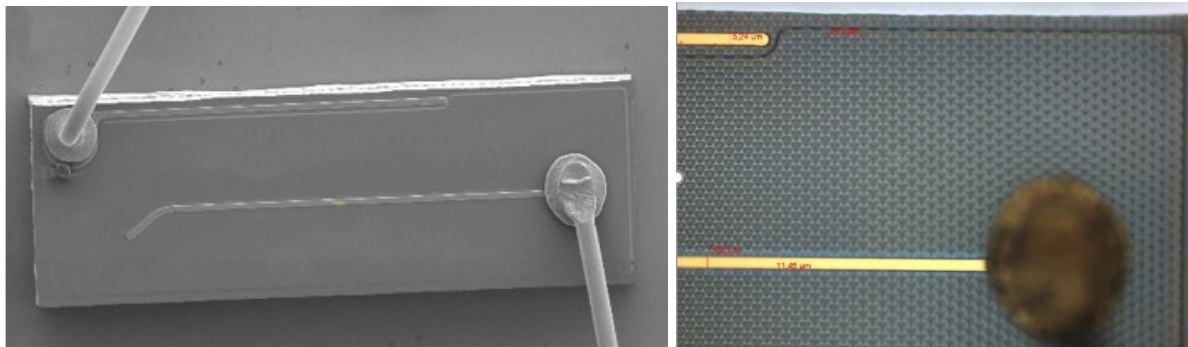
(INFRINGEMENT OF THE FEHRER ’519 PATENT)

107. OSRAM re-alleges and incorporates the allegations of all prior paragraphs of this Complaint as if set forth in their entirety herein.

108. Defendants have infringed and continue to infringe at least claim 24 of the Fehrer '519 patent in violation of 35 U.S.C. § 271(a) and/or 271(g). The infringing activities include, but are not limited to, the use, sale, importation, and/or offer for sale, without authority, of LED packages that fall within the scope of the claims of the Fehrer '519 patent, and products incorporating such LED packages, including, but not limited to the GoodDay product.

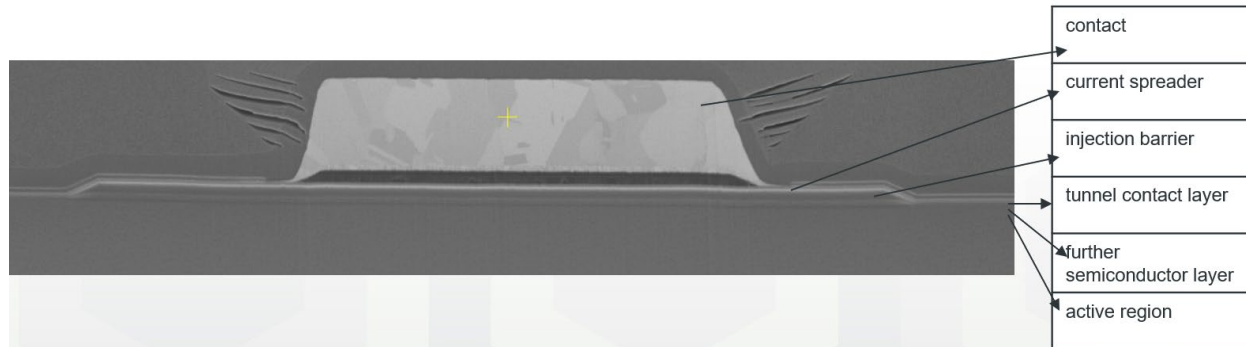
109. The packaged LED device in the GoodDay product having a sedimented phosphor is representative of how the GoodDay device infringes the Fehrer '519 patent.

110. By way of example, in the event that the preamble of claim 24 of the Fehrer '519 patent is limiting, as reflected both by the contents of the device and scanning electron microscopy images of the product, the packaged LED device in the GoodDay product includes a semiconductor chip, comprising: a semiconductor body having a semiconductor layer sequence that includes an active region provided for generating radiation; and a contact arranged on the semiconductor body:



111. As further reflected by additional Scanning Electron Microscope images at a FIB (Focused Ion Beam) cut through the p-current spreader structure below of the packaged LED device in the GoodDay product, in accordance with claim 24 of the Fehrer '519 patent, the GoodDay product has an injection barrier formed between the contact and the active region; a current spreading layer, which is electrically conductively connected to the contact and which is

provided for injecting charge carriers into the active region during operation of the semiconductor chip in a lateral direction outside the injection barrier; and a tunnel contact layer arranged between the current spreading layer and the active region; wherein the tunnel contact layer is different with regard to its conduction type than a further semiconductor layer arranged between the tunnel contact layer and the active region:



112. As a direct and proximate result of Defendants' acts of infringement of the claims of the Fehrer '519 patent as set forth in paragraphs 108 to 112 herein, OSRAM has suffered and continues to suffer damages and irreparable harm. Unless Defendants' acts of infringement are enjoined by this Court, OSRAM will continue to be damaged and irreparably harmed.

113. OSRAM has no adequate remedy at law for the irreparable harm suffered as a direct and proximate result of Defendants' acts of infringement of the Fehrer '519 patent.

PRAYER FOR RELIEF

WHEREFORE, OSRAM respectfully requests that this Court:

A. Enter judgment that Defendants have infringed one or more claims of the Braune '956 patent, the Eberhard '191 patent, the Jaeger '282 patent, the Kraus '146 patent, the De Anna '734 patent, the Arndt '819 patent, the Chemel '392 patent, and the Fehrer '519 patent;

B. Award OSRAM damages to compensate it for Defendants' infringement of the Braune '956 patent, the Eberhard '191 patent, the Jaeger '282 patent, the Kraus '146 patent, the

De Anna '634 patent, the Arndt '819 patent, the Chemel '392 patent, and the Fehrer '519 patent, together with pre- and post-judgment interest;

C. Enjoin Defendants and their officers, agents, servants, employees, and representatives, and all others in active concert or participation with Defendants, from further infringing the Braune '956 patent, the Eberhard '191 patent, the Jaeger '282 patent, the Kraus '146 patent, the De Anna '734 patent, the Arndt '819 patent, the Chemel '392 patent, and the Fehrer '519 patent;

D. Declare this case to be an exceptional case and award OSRAM its attorneys' fees pursuant to 35 U.S.C. § 285;

E. Award OSRAM attorneys' fees, costs, and expenses incurred by OSRAM in bringing this action, together with pre- and post-judgment interest; and

F. Award such other and further relief as the Court deems just and proper.

JURY DEMAND

Pursuant to Rules 38 and 39 of the Federal Rules of Civil Procedure, OSRAM respectfully demands a jury trial on all issues and claims so triable.

Respectfully submitted,

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