

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

**SEOUL SEMICONDUCTOR CO.,
LTD. and SEOUL VIOSYS CO., LTD.**

Plaintiffs,

v.

FRY'S ELECTRONICS, INC.

Defendant.

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CIVIL ACTION NO. 18-cv-386

**AMENDED COMPLAINT FOR PATENT INFRINGEMENT
AND DEMAND FOR JURY TRIAL**

Plaintiffs Seoul Semiconductor Co., Ltd. ("Seoul Semiconductor") and Seoul Viosys Co., Ltd. ("Seoul Viosys"), (collectively "Plaintiffs") for their Amended Complaint against Defendant Fry's Electronics, Inc. ("Fry's") allege as follows:

INTRODUCTION

1. Plaintiffs bring this patent infringement action to protect their valuable patented technology relating to light-emitting diodes ("LEDs") and LED technology in lighting and televisions. An LED is a semiconductor device that converts electrical energy into light. LEDs have many advantages over conventional light sources, including lower energy consumption, longer lifetime, and smaller size.

2. Seoul Semiconductor was founded in 1992 with around 30 employees in a small space of a commercial building in Bongchen-dong, Seoul. From those 30 employees, Seoul Semiconductor grew into one of the largest manufacturers of LEDs in the world. Seoul Viosys is also a leading company in the LED industry and an affiliate company of Seoul Semiconductor.

3. Seoul Semiconductor's success is in large part due to its significant investment in innovation and respect for intellectual property. Seoul Semiconductor has invested in research and

development (“R&D”) for the last two decades. Seoul Semiconductor invests over 10% of sales revenue into R&D and owns one of the largest LED patent portfolios in the world, which includes more than 10,000 patents worldwide.

THE PARTIES

4. Plaintiff Seoul Semiconductor is a company organized and existing under the laws of the Republic of Korea, with its principal place of business at 1B-25, 727, Wonsi-dong, Danwon-gu, Ansan-city, Gyeonggi-do, Korea 425-851.

5. Plaintiff Seoul Viosys is a company organized and existing under the laws of the Republic of Korea, with its principal place of business at 65-16, Sandan-ro163beon-gil, Danwon-gu, Ansan-si, Gyeonggi-do, Korea 425-851.

6. On information and belief, Fry’s is a company organized and existing under the laws of the State of California with its principal place of business at 600 East Brokaw Road, San Jose, California 95112.

7. On information and belief, Fry’s is in the business of offering for sale, selling and distributing lighting products including light products based on LED technology and offering for sale, sell and distributing televisions including televisions based on LED technology.

8. Among Fry’s television products are the RCA LED TV LED24G45RQ, the RCA LED TV LED55C55R120Q, and the RCA LED TV LED60B55R120Q.

9. An image of the packaging for the RCA LED TV LED24G45RQ television is provided below left. An image of the RCA LED TV LED24G45RQ television is provided below right.



10. An image of the packaging for the RCA LED TV LED55C55R120Q television is provided below left. An image of the RCA LED TV LED55C55R120Q television is provided below right.



11. An image of the RCA LED TV LED60B55R120Q television is provided below.



12. Among Fry's lighting products are the Ottlite LED Task Lamp 290G59, NTE LED Wall Light 69-LL-10, and the NTE LED Light Bar 69-LL-15.

13. An image of the packaging for the Ottlite LED Task Lamp 290G59 is provided below left. An image of the Ottlite LED Task Lamp 290G59 is provided below right.



14. An image of the packaging for the NTE LED Wall Light 69-LL-10 is provided below left. An image of the NTE LED Wall Light 69-LL-10 is provided below right.

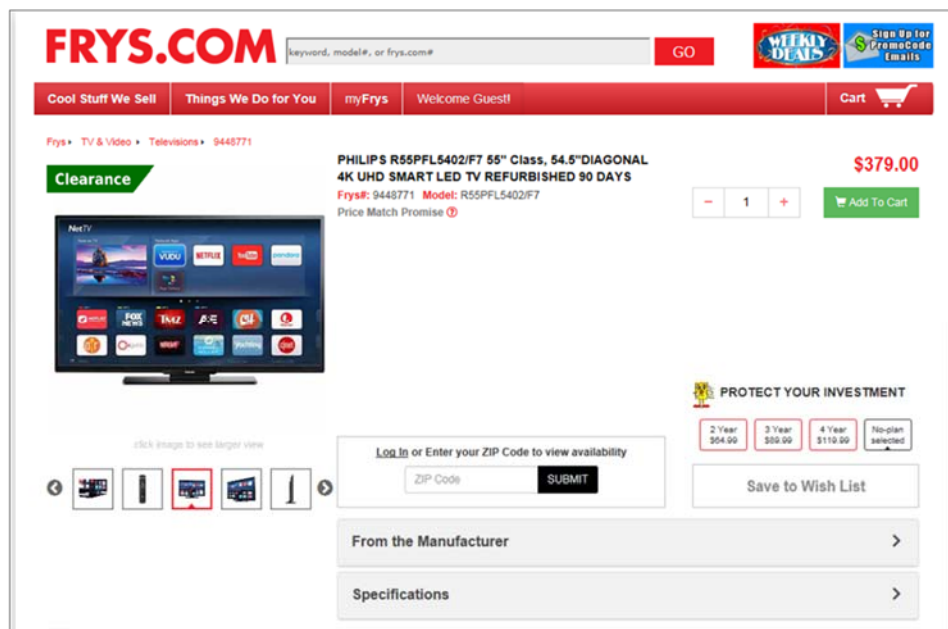


15. The first image below is of the packaging for the NTE LED Light Bar 69-LL-15. The second image below is of the NTE LED Light Bar 69-LL-15.





16. Among Fry's television products is the Philips 55PFL5402/F7.
17. An image of Fry's webpage for the 55PFL5402/F7 television is provided below.



18. An image of the front of the 55PFL5402/F7 television is provided below.



JURISDICTION AND VENUE

19. This is an action for patent infringement, under the patent laws of the United States, 35 U.S.C. § 271 *et seq.* This Court has subject matter jurisdiction under 28 U.S.C. §§1331 and 1338(a).

20. This Court has personal jurisdiction over Fry's and, upon information and belief, is amenable to service via its registered agent Phillip L. Sampson, Jr. located at Bracewell & Giuliani, L.L.P., 711 Louisiana Street, Suite 2300, Houston, Texas 77002.

21. Venue is proper within this judicial district under 28 U.S.C. §1400(b) because Fry's has committed acts of infringement in this judicial district and has a regular and established place of business within this judicial district. More specifically, a number of the infringing products were purchased at a Fry's store located at 700 E. Plano Parkway in Plano, Texas, which is within this judicial district.

PATENTS-IN-SUIT

22. On September 9, 2014, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,829,552 ("the '552 Patent"), entitled "Light Emitting Device," to Seo *et al.* Seoul Semiconductor is the owner by assignment of the '552 Patent. A true and correct copy of the '552 Patent is attached hereto as Exhibit 1.

23. On September 3, 2013, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,525,212 ("the '212 Patent"), entitled "Light-Emitting Diode Having Electrode Extensions," to Kim *et al.* Seoul Viosys is the owner by assignment of the '212 Patent. A true and correct copy of the '212 Patent is attached hereto as Exhibit 2.

24. On March 8, 2011, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,901,113 ("the '113 Patent"), entitled "Side Illumination Lens and Luminescent Device Using the Same," to Kim *et al.* Seoul Semiconductor is the owner by assignment of the '113 Patent. A true and correct copy of the '113 Patent is attached hereto as Exhibit 3.

25. On December 27, 2016, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,530,947 ("the '947 Patent"), entitled "Lens and Light Emitting Module For Surface Illumination," to Kim *et al.* Seoul Semiconductor is the owner by assignment of the '947 Patent. A true and correct copy of the '947 Patent is attached hereto as Exhibit 4.

26. On May 5, 2015, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,022,618 (“the ’618 Patent”), entitled “Aspherical LED Lens and Light Emitting Device Including the Same,” to Park *et al.* Seoul Semiconductor is the owner by assignment of the ’618 Patent. A true and correct copy of the ’618 Patent is attached hereto as Exhibit 5.

27. On December 17, 2013, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,608,328 (“the ’328 Patent”), entitled “Light Source with Secondary Emitter Conversion Element,” to Panagotacos *et al.* Seoul Semiconductor is the owner by assignment of the ’328 Patent. A true and correct copy of the ’328 Patent is attached hereto as Exhibit 6.

28. On November 17, 2009, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,618,162 (“the ’162 Patent”), entitled “Irradiance-Redistribution Lens and Its Applications to LED Downlights,” to Parkyn *et al.* Seoul Semiconductor is the owner by assignment of the ’162 Patent. A true and correct copy of the ’162 Patent is attached hereto as Exhibit 7.

29. On March 13, 2012, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,132,952 (“the ’952 Patent”), entitled “Backlight Panel Employing White Light Emitting Diode Having Red Phosphor and Green Phosphor,” to Ryu *et al.* Seoul Semiconductor is the owner by assignment of the ’952 Patent. A true and correct copy of the ’952 Patent is attached hereto as Exhibit 8.

30. On November 15, 2011, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,058,662 (“the ’662 Patent”), entitled “Light Emitting Diode and Method of Fabricating the Same,” to Kim *et al.* Seoul Semiconductor is the owner by assignment of the ’662 Patent. A true and correct copy of the ’662 Patent is attached hereto as Exhibit 9.

31. On February 21, 2017, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,577,157 (“the ’157 Patent”), entitled “Light Emitting Diode Chip Having Distributed Bragg Reflector and a Method of Fabricating the Same,” to Lee *et al.* Seoul

Viosys is the owner by assignment of the '157 Patent. A true and correct copy of the '157 Patent is attached hereto as Exhibit 10.

32. On May 17, 2016, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,343,631 ("the '631 Patent"), entitled "Light Emitting Diode Chip Having Distributed Bragg Reflector and Method of Fabricating the Same," to Lee *et al.* Seoul Viosys is the owner by assignment of the '631 Patent. A true and correct copy of the '631 Patent is attached hereto as Exhibit 11.

33. On May 31, 2011, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,951,626 ("the '626 Patent"), entitled "Light Emitting Device and Method of Manufacturing the Same," to Lee *et al.* Seoul Viosys is the owner by assignment of the '626 Patent. A true and correct copy of the '626 Patent is attached hereto as Exhibit 12.

34. On October 24, 2017, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,799,800 ("the '800 Patent"), entitled "Light Emitting Device and Method of Fabricating the Same," to Jang *et al.* Seoul Viosys is the owner by assignment of the '800 Patent. A true and correct copy of the '800 Patent is attached hereto as Exhibit 13.

35. On July 25, 2017, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,716,210 ("the '210 Patent"), entitled "Light Emitting Diode and Method of Fabricating the Same," to Kim *et al.* Seoul Viosys is the owner by assignment of the '210 Patent. A true and correct copy of the '210 Patent is attached hereto as Exhibit 14.

36. On September 13, 2005, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,942,731 ("the '731 Patent"), entitled "Method for Improving the Efficiency of Epitaxially Produced Quantum Dot Semiconductor Components," to Sellin *et al.* Seoul Semiconductor is the owner by assignment of the '731 Patent. A true and correct copy of the '731 Patent is attached hereto as Exhibit 15.

37. On March 22, 2016, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,293,664 ("the '664 Patent"), entitled "Wafer-Level Light Emitting Diode Package And Method Of Fabricating The Same," to Seo *et al.* Seoul Semiconductor is the owner

by assignment of the '664 Patent. A true and correct copy of the '664 Patent is attached hereto as Exhibit 16.

38. On December 27, 2016, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,530,939 ("the '939 Patent"), entitled "Light Emitting Diode For Surface Mount Technology, Method Of Manufacturing The Same, And Method Of Manufacturing Light Emitting Diode Module," to Chae *et al.* Seoul Viosys is the owner by assignment of the '939 Patent. A true and correct copy of the '939 Patent is attached hereto as Exhibit 17.

39. On May 30, 2017, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,664,356 ("the '356 Patent"), entitled "Illumination Lens For Short-Throw Lighting," to Pelka *et al.* Seoul Semiconductor is the owner by assignment of the '356 Patent. A true and correct copy of the '356 Patent is attached hereto as Exhibit 18.

40. On October 17, 2017, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 9,793,448 ("the '448 Patent"), entitled "Light Emitting Diode Chip Having Wavelength Converting Layer And Method Of Fabricating The Same, And Package Having The Light Emitting Diode Chip And Method Of Fabricating The Same," to Jung *et al.* Seoul Semiconductor is the owner by assignment of the '448 Patent. A true and correct copy of the '448 Patent is attached hereto as Exhibit 19.

COUNT I.

INFRINGEMENT OF THE '552 PATENT

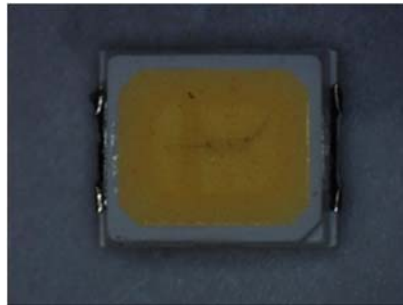
EXAMPLE CLAIM 1

41. Fry's has infringed and continues to infringe one or more claims of the '552 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the Ottlite LED Task Lamp 290G59 and NTE LED Light Bar 69-LL-15 within the United States or importing the Ottlite LED Task Lamp 290G59 and NTE LED Light Bar 69-LL-15 into the United States.

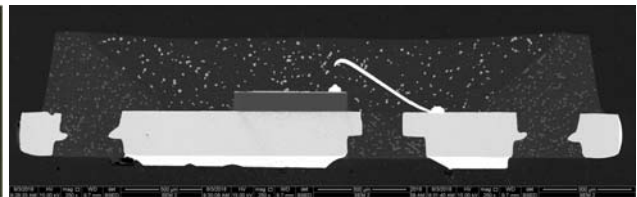
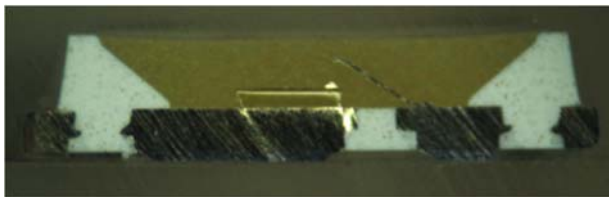
42. The Ottlite LED Task Lamp 290G59 includes 30 packaged LED, each of which comprises a light emitting diode device. An image of the packaged LEDs from a Ottlite LED Task Lamp 290G59 is reproduced below.

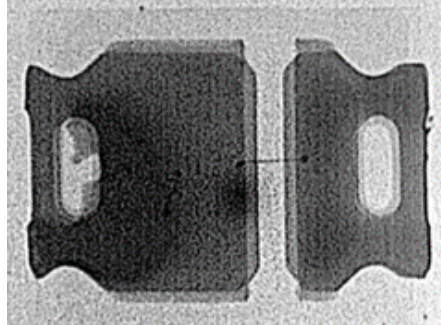


43. An image of the top of a packaged LED from an Ottlite LED Task Lamp 290G59 is reproduced below.



44. Three images are provided below. The image below left is an optical image of a cross-section through the package and the image below right is a scanning electron microscope image of a cross-section through the package. The bottom image is an x-ray image taken vertically through the pair of lead frames.





45. The images above depict a pair of spaced-apart lead frames, each having an upper and lower surface. Each of the lead frames also includes sidewalls that connect the upper and lower surfaces. All three images show a light-emitting diode chip on the top surface of the left lead frame.

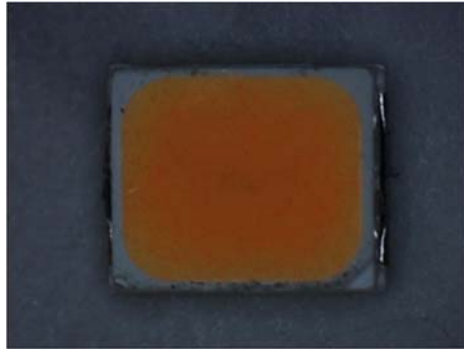
46. The x-ray image above depicts for each lead frame a central relatively dark area that encompasses the majority of each lead frame.

47. The x-ray image also depicts, for each lead frame, three relatively bright zones at the periphery. The relatively bright areas correspond to the locations with insets in the sidewalls, which can also be seen in the cross-sectional image above as small areas under each lead frame that are filled with resin. The three inset sidewalls described in the preceding paragraph at least partially define a fixing space for each of the lead frames that undercuts the upper surface. The fixing spaces are filled with resin as shown in the images above to support the two lead frames.

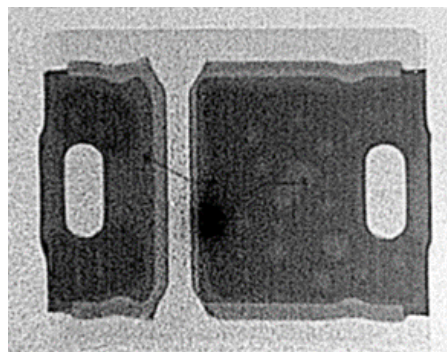
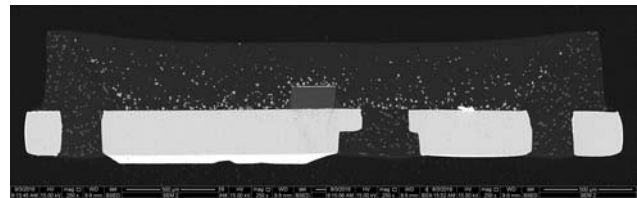
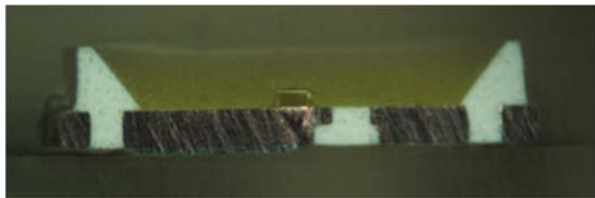
48. The NTE LED Light Bar 69-LL-15 includes 24 packaged LED, each of which comprises a light emitting diode device. An image of the packaged LEDs from a NTE LED Light Bar 69-LL-15 is reproduced below.



49. An image of the top of a packaged LED from an NTE LED Light Bar 69-LL-15 is reproduced below.



50. Three images are provided below. The image below left is an optical image of a cross-section through the package and the image below right is a scanning electron microscope image of a cross-section through the package. The bottom image is an x-ray image taken vertically through the pair of lead frames.



51. The images above depict a pair of spaced-apart lead frames, each having an upper and lower surface. Each of the lead frames also includes sidewalls that connect the upper and lower surfaces. All three images show a light-emitting diode chip on the top surface of the left lead frame.

52. The x-ray image above depicts for each lead frame a central relatively dark area that encompasses the majority of each lead frame.

53. The x-ray image also depicts, for each lead frame, three relatively bright zones at the periphery. The relatively bright areas correspond to the locations with insets in the sidewalls, which can also be seen in the cross-sectional image above as small areas under each lead frame

that are filled with resin. The three inset sidewalls described in the preceding paragraph at least partially define a fixing space for each of the lead frames that undercuts the upper surface. The fixing spaces are filled with resin as shown in the images above to support the two lead frames.

54. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

55. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

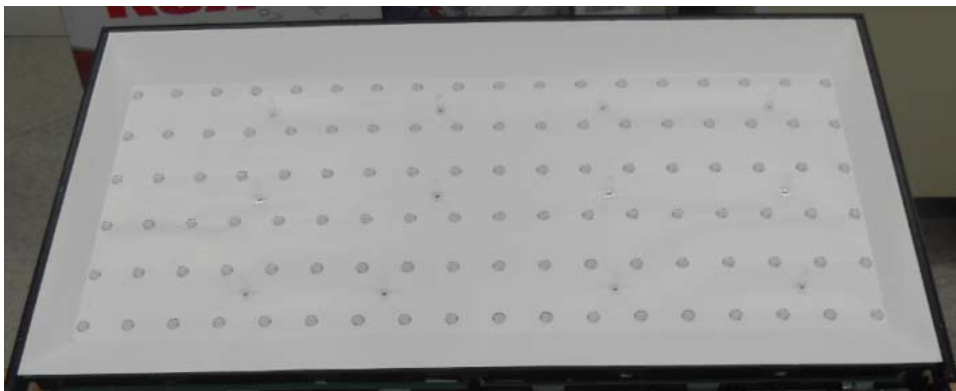
COUNT II.

INFRINGEMENT OF THE '212 PATENT

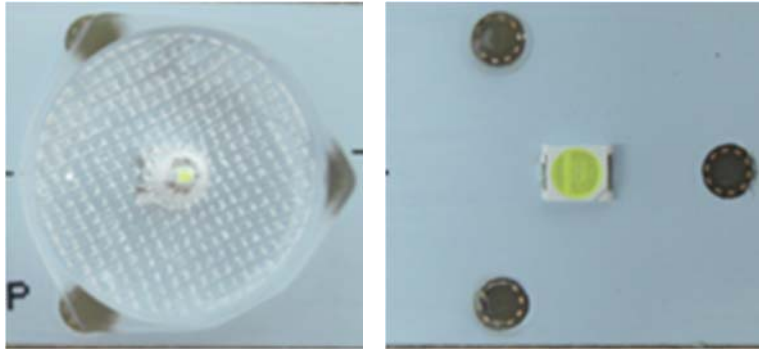
EXAMPLE CLAIM 1

56. Fry's has infringed and continues to infringe one or more claims of the '212 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the RCA LED TV LED55C55R120Q television within the United States or importing the RCA LED TV LED55C55R120Q television into the United States.

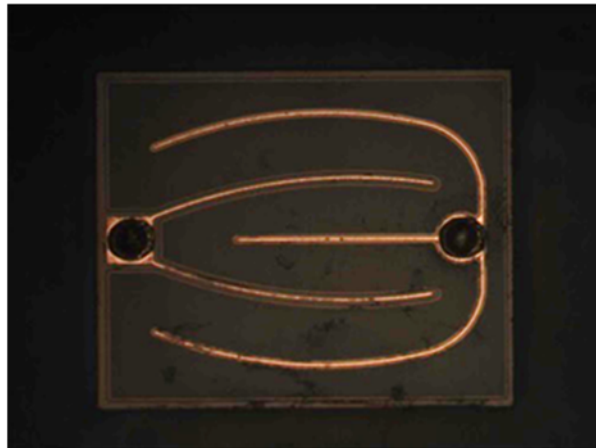
57. The RCA LED TV LED55C55R120Q television includes a plurality of LED-based light emitting devices. The image below shows the RCA LED TV LED55C55R120Q television after removal of the liquid crystal display panel, revealing 108 LED-based light emitting devices and their associated lenses.



58. Two images are provided below. The image below left is a close up view from above of a lens. The image below right is a close up view of a light emitting device after removal of its associated lens.

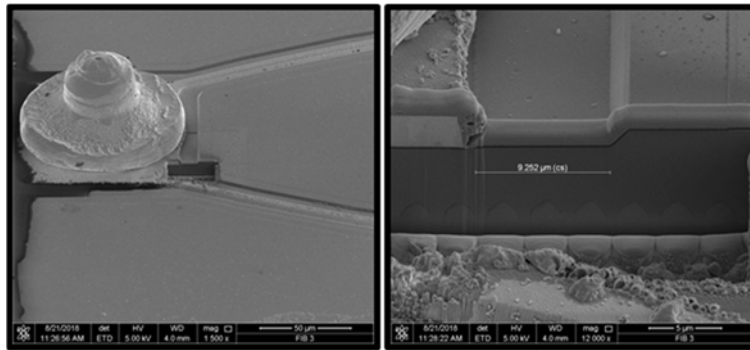


59. The image below is of the top surface of a light emitting diode from the RCA LED TV LED55C55R120Q television. Two electrode pads are shown in the image below, an n-electrode pad in the center near the left edge and a p-electrode pad in the center near the right edge. The square region around the n-electrode pad indicates an exposed portion of an n-type contact layer that extends to all four edges of the light emitting diode. The exposed portions of the n-type contact layer appears as a slightly lighter in the image. The p-electrode pad sits atop a mesa structure comprising a p-type contact layer over an active layer, the mesa structure sitting atop the n-type contact layer. The mesa structure appears slightly darker in the image.



60. The images below, which were created using a scanning electron microscope after a hole was milled into the light emitting diode using an ion beam. The image below left shows a hole created near the n-electrode pad through a portion of an exposed n-type contact layer and a

portion of the mesa. The image below right provides an enlarged view of the side of the milled hole, again showing the n-type contact layer and the mesa comprising the active and p-type contact layers.



61. As the above top-surface view of the light emitting diode shows, two n-extensions extend from the n-electrode pad toward the right edge. The far right ends of the n-extensions are further apart than the far left ends that connect to the n-electrode pad. The top n-extension is convexly bent towards the top edge and the bottom n-extension is convexly bent toward the bottom edge.

62. The top-surface view of the light emitting diode also shows three p-extensions extending from the p-electrode pad toward the left edge. The top and bottom p-extensions enclose the two n-extensions. The third central p-extension extends between the two n-extensions.

63. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

64. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT III.

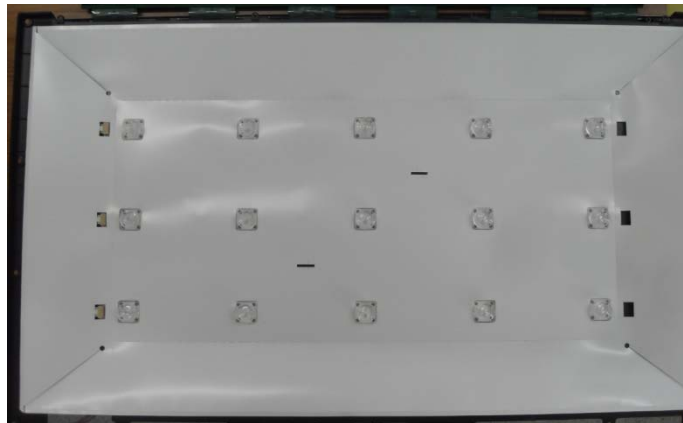
INFRINGEMENT OF THE '113 PATENT

EXAMPLE CLAIM 1

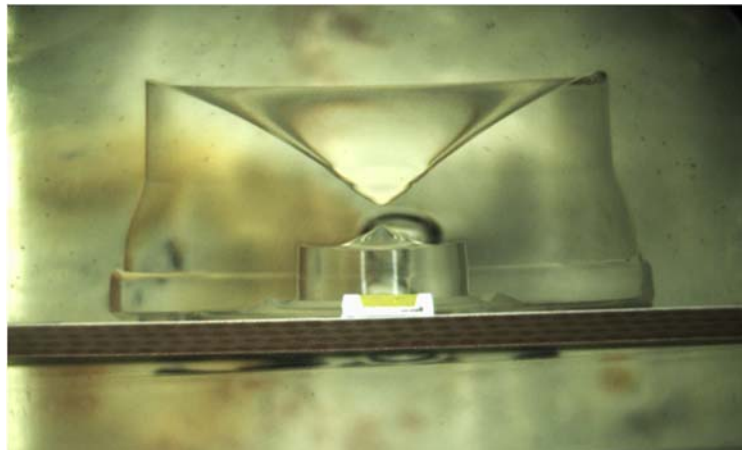
65. Fry's has infringed and continues to infringe one or more claims of the '113 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without

authority using, offering to sell, and/or selling the RCA LED TV LED24G45RQ television within the United States or importing the RCA LED TV LED24G45RQ television into the United States.

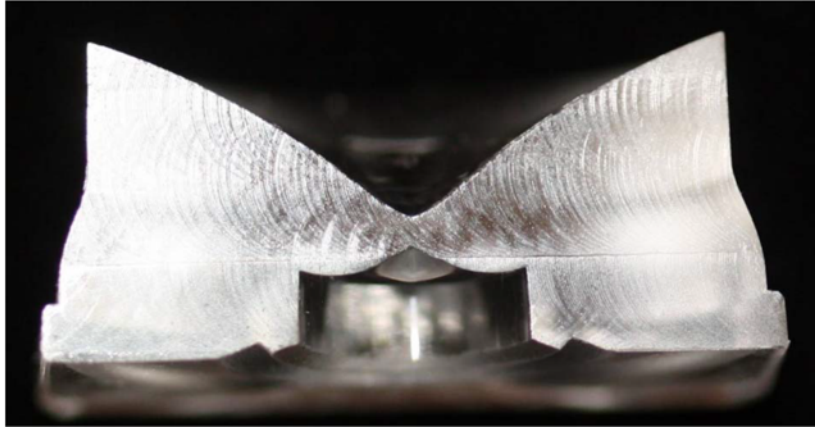
66. The RCA LED TV LED24G45RQ television includes a plurality of LED-based light emitting devices. The image below shows the RCA LED TV LED24G45RQ television after removal of the liquid crystal display panel, revealing fifteen light emitting devices, each including a light emitting diode and a lens arranged to receive light from its associated light emitting diode.



67. Below is an image of cross-section of an example light emitting device from a RCA LED TV LED24G45RQ television. This image shows with a packaged light emitting diode as well as a lens above the light-emitting surface of the light emitting diode.



68. Below is an image of a cross-section through a lens removed from a RCA LED TV LED24G45RQ television. The lens comprises a solid of revolution of the cross-section around the central axis of the lens.



69. The upper surface of the lens includes a total reflection surface having a total reflection slope with respect to a central axis of the light emitting diode. The side surfaces of the lens include a curved refractive surfaces that extends away from the central axis and beyond a periphery of the total reflection surface of the lens.

70. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

71. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT IV.

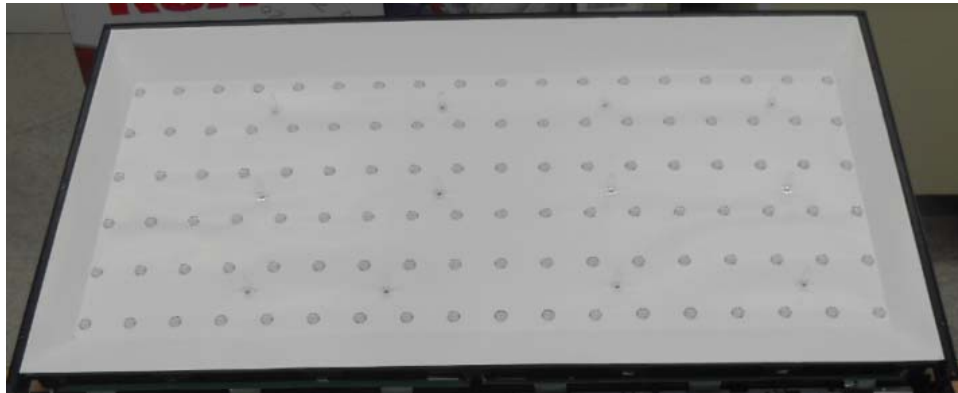
INFRINGEMENT OF THE '618 PATENT

EXAMPLE CLAIM 1

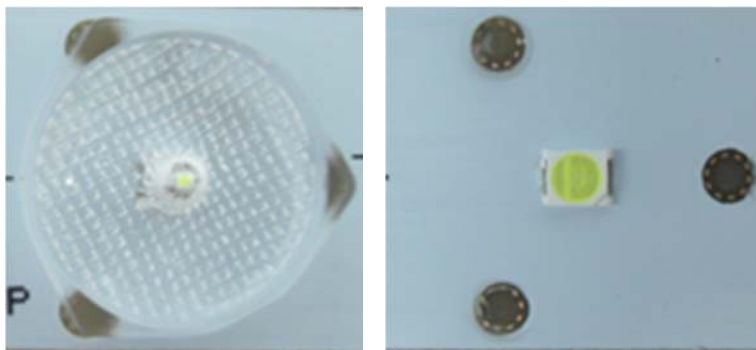
72. Fry's has infringed and continues to infringe one or more claims of the '618 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority using, offering to sell, and/or selling the RCA LED TV LED55C55R120Q television within the United States or importing the RCA LED TV LED55C55R120Q television into the United States.

73. The RCA LED TV LED55C55R120Q television includes a plurality of LED-based light emitting devices. The image below shows the RCA LED TV LED55C55R120Q television

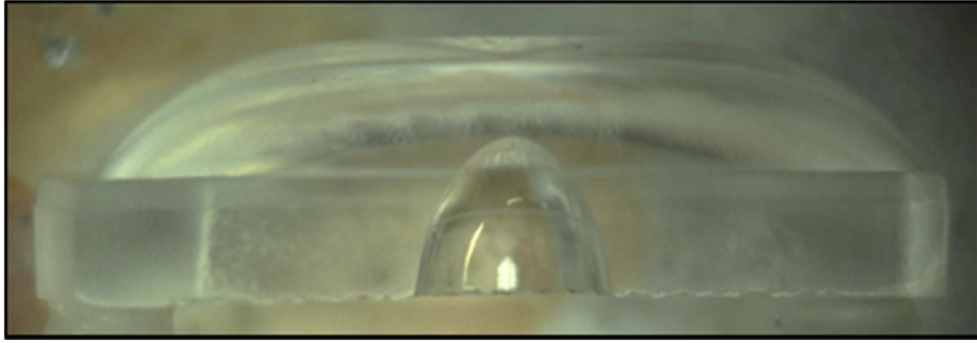
after removal of the liquid crystal display panel, revealing 108 LED-based light emitting devices and their associated lenses.



74. Two images are provided below. The image below left is a close up view from above of a lens. The image below right is a close up view of a light emitting device after removal of its associated lens.



75. The image below is a side-view of a lens from the RCA LED TV LED55C55R120Q television. As the images show, the lens is aspherical and rotationally symmetrical. The lens includes a central cavity within which an associated light emitting device is provided. The surface of the central cavity comprises a light entrance plane configured to receive light emitted from the associated light emitting device. The upper and side surfaces comprise a light exit plane configured to radiate the light received by the light entrance plane.



76. As the above image shows, the substantially vertical portions of the side surfaces, which comprise part of the light exit plane, are textured, resulting in protrusions extending above the surface of the lens. The side surface of the lens also includes a curved surface.

77. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

78. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

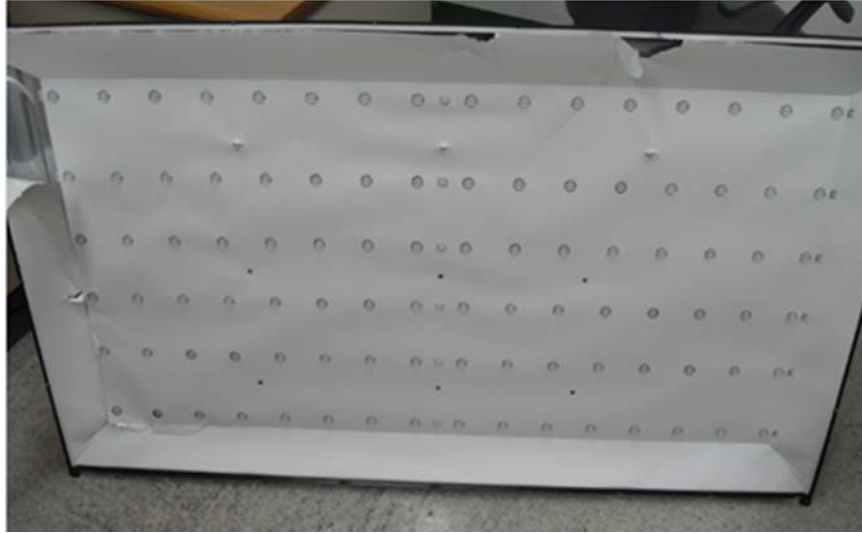
COUNT V.

INFRINGEMENT OF THE '328 PATENT

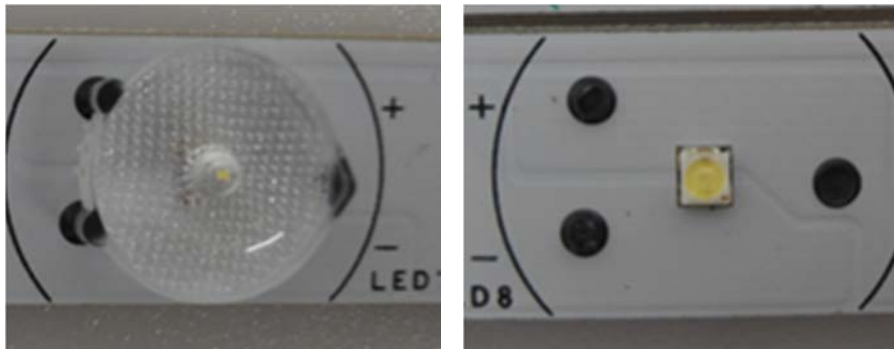
EXAMPLE CLAIM 33

79. Fry's has infringed and continues to infringe one or more claims of the '328 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the RCA LED TV LED60B55R120Q television within the United States or importing the RCA LED TV LED60B55R120Q television into the United States.

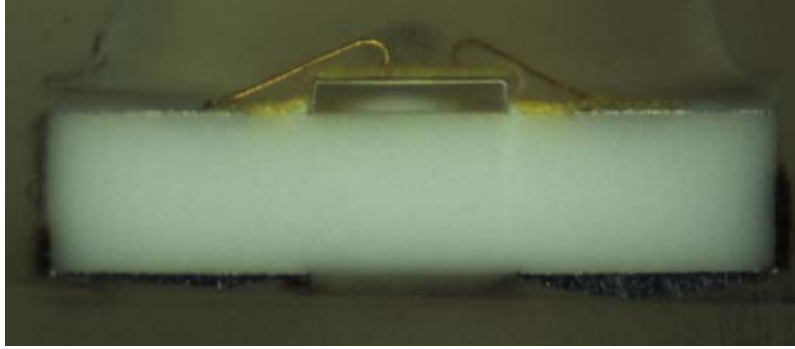
80. The RCA LED TV LED60B55R120Q television includes a plurality of LED-based light emitting devices. The image below shows the RCA LED TV LED60B55R120Q television after removal of the liquid crystal display panel, revealing 96 LED-based light emitting devices and their associated lenses.



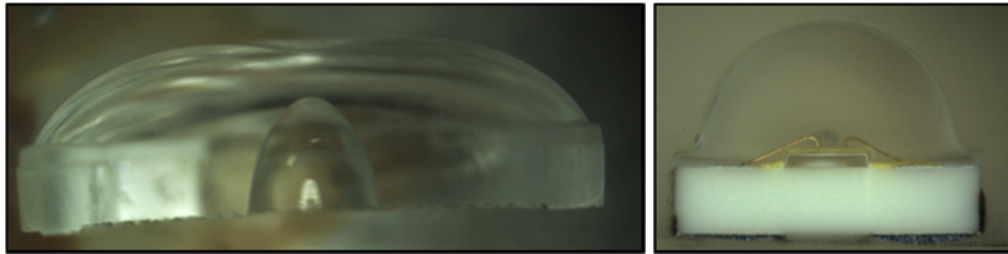
81. Two images are provided below. The image below left is a close up view from above of a lens from a RCA LED TV LED60B55R120Q television. The lens is a non-imaging type. The image below right is a close up view of a light emitting device from a RCA LED TV LED60B55R120Q television after removal of its associated lens.



82. The image below is a side view of a light emitting device from a RCA LED TV LED60B55R120Q television. The primary excitation source is shown as a LED connected on its top surface by a pair of wires. The image also shows a layer of phosphor coating the top surface of the LED. The phosphor appears yellow in color in the image. The phosphor comprises a second emitter conversion element that is optically coupled to the LED and absorbs some of the blue light emitted from the LED to emit light at a longer wavelength part of the spectrum. The light emitted by the phosphor has a peak and a band of wavelengths around the peak.



83. Two images are provided below. The image below left is of a lens from a RCA LED TV LED60B55R120Q television taken from the side. As the image shows, the lens has a central cavity. The image below right is a side view of a light emitting device, with a rounded encapsulating material formed over the LED. When affixed within a RCA LED TV LED60B55R120Q, the encapsulated LED fits into the central cavity of the lens, with the encapsulated material existing in the gap between the layer of phosphor and the lens.



84. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

85. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT VI.

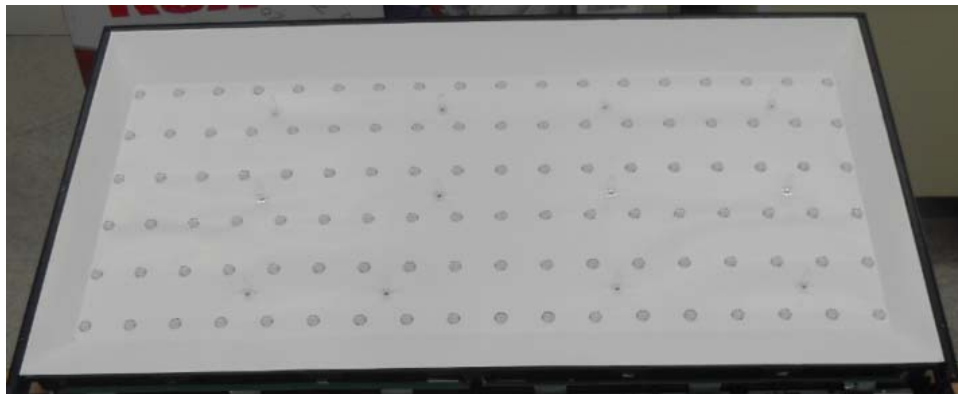
INFRINGEMENT OF THE '162 PATENT

EXAMPLE CLAIM 1

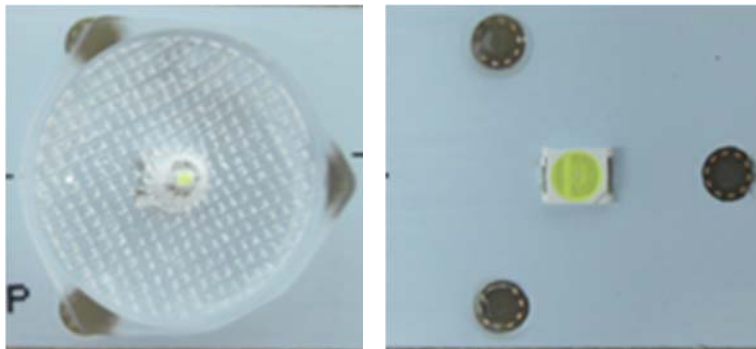
86. Fry's has infringed and continues to infringe one or more claims of the '162 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the RCA LED TV LED55C55R120Q

television within the United States or importing the RCA LED TV LED55C55R120Q television into the United States.

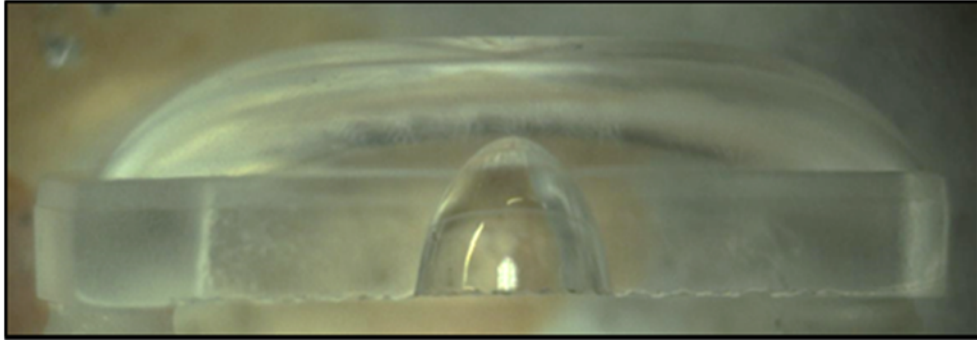
87. The RCA LED TV LED55C55R120Q television includes a plurality of LED-based light emitting devices. The image below shows the RCA LED TV LED55C55R120Q television after removal of the liquid crystal display panel, revealing 108 LED-based light emitting devices and their associated lenses.



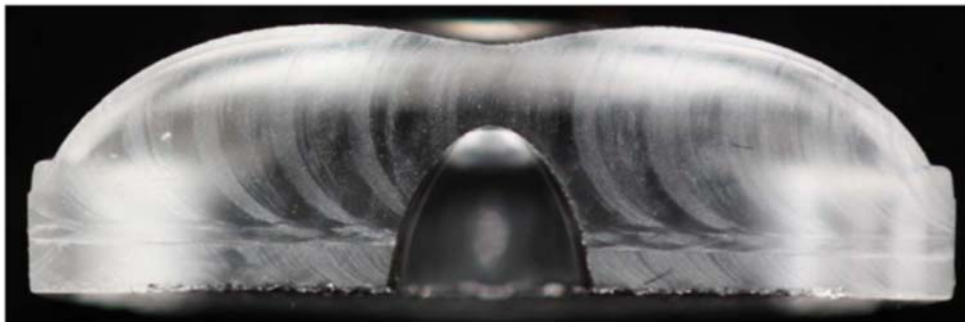
88. Two images are provided below. The image below left is a close up view from above of a lens, which comprises a transparent dielectric. The image below right is a close up view of a light emitting device after removal of its associated lens.



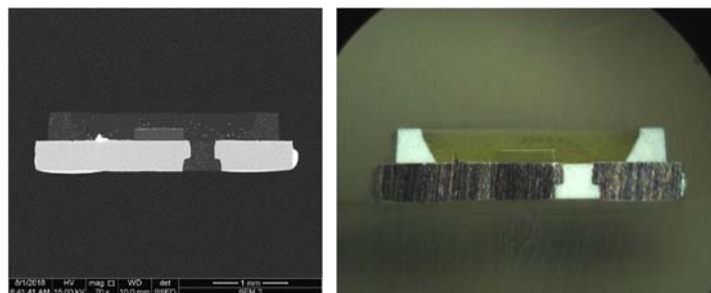
89. The image below is a side-view of a lens from the RCA LED TV LED55C55R120Q television. As this image and the one above show, the lens comprises a solid of revolution about a central axis of the lens. The lens includes a central cavity within which the light emitting device is provided. The surface of the central cavity comprises a light entry surface for light emitted from the light emitting device. The upper and side surfaces comprise a light exit surface configured to radiate the light received by the light entrance surface into a diverging output beam.



90. The image below is of a cross-section of a lens, which shows the profile of both the light entry surface and the light exit surface. The profile of the light entry surface results in refraction of the entering light, which results in light incident at the light exit surface having a predominantly uniform irradiance. The predominantly uniform irradiance incident at the light exit surface is then refracted to create an output beam. The light entry surface comprises a first concave shape relative to the light source and the light exit surface comprises a second concave shape relative to the light source, with the light exit surface being substantially larger than the light entry surface.



91. Two images are provided below. The left and right images show a side view of a light source from the RCA LED TV LED55C55R120Q television created using a microscope and scanning electron microscope. The light source has a width of approximately 3 millimeters.



92. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

93. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

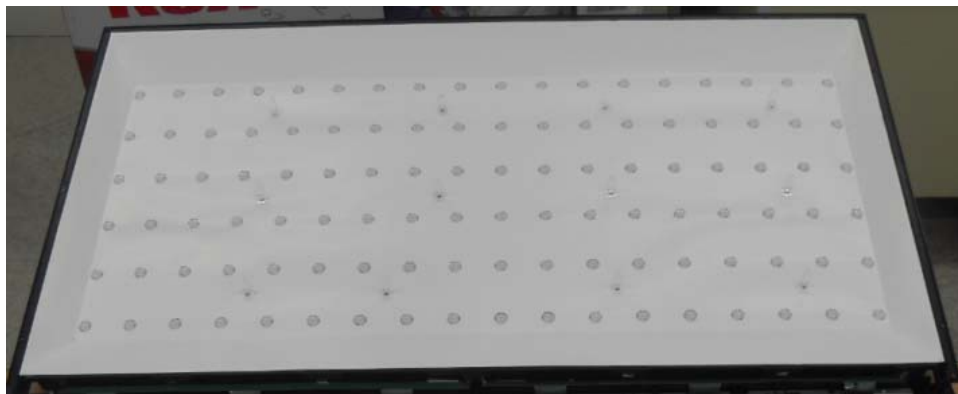
COUNT VII.

INFRINGEMENT OF THE '947 PATENT

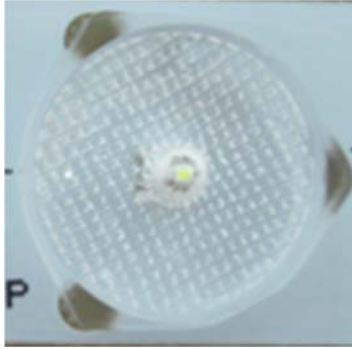
EXAMPLE CLAIM 11

94. Fry's has infringed and continues to infringe one or more claims of the '947 Patent, including but not limited to exemplary claim 11, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the RCA LED TV LED55C55R120Q television within the United States or importing the RCA LED TV LED55C55R120Q television into the United States.

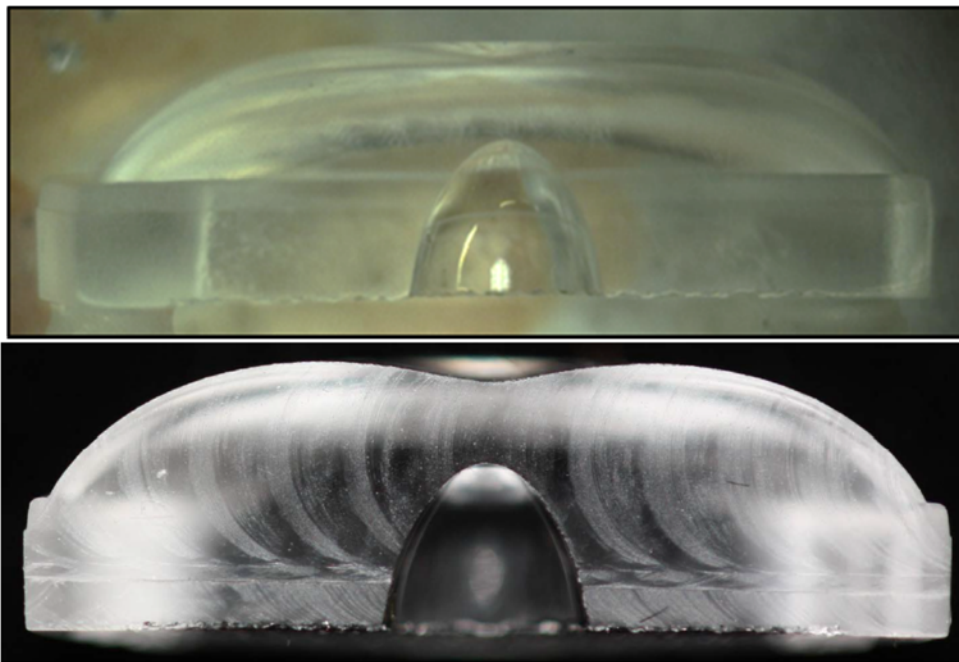
95. The RCA LED TV LED55C55R120Q television includes a plurality of lenses for diffusing light. The image below shows the RCA LED TV LED55C55R120Q television after removal of the liquid crystal display panel, revealing six rows of 18 lenses each.



96. The image below left is a close up view from above of a lens.



97. Two images are provided below. The top image is a side-view of a lens from the RCA LED TV LED55C55R120Q television. The bottom image was taken after a lens was cross-sectioned. As the images show, the lens has a concavity at its center. The surface of the concavity forms a light incident surface. The images below also show the upper surface of the lens through which light is emitted.



98. Light is emitted through the upper surface of the lens.

99. As seen in the cross-sectional image, the portion of the upper surface beyond 15 degrees has at least three sequential sections. The sections can be discerned based on the change in curvature of the upper surface.

100. Fry's infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT VIII.

INFRINGEMENT OF THE '952 PATENT

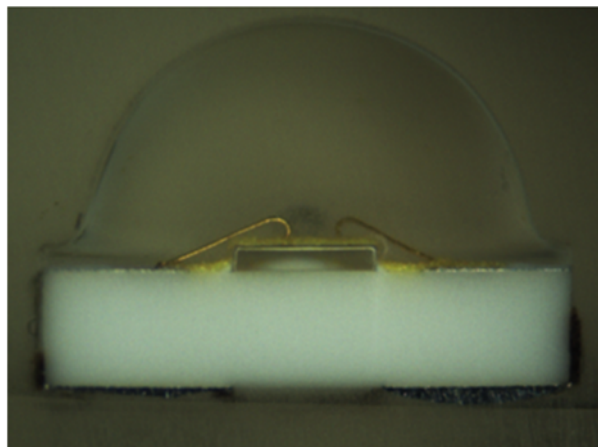
EXAMPLE CLAIM 1

101. Fry's has infringed and continues to infringe one or more claims of the '952 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority using, offering to sell, and/or selling the RCA LED TV LED60B55R120Q television within the United States or importing the RCA LED TV LED60B55R120Q television into the United States.

102. Three images are provided below showing a deconstructed RCA LED TV LED60B55R120Q television. The images below left and right show the television after the front panel components (image at right) have been separated from the back of the television (image at left). The left image shows 96 white LED-based white light emitting devices with a reflection sheet surrounding and below the LED-based white light emitting devices. The image at the bottom shows the back of the television after removal of the reflection sheet. The components from the front of the television, which are shown from back to front in the image below right, include a diffusion plate. The bottom surface of the diffusion plate is the uppermost surface in the image and has a frosted appearance.



103. The image below is a side view of a LED-based white light emitting device from the RCA LED TV LED60B55R120Q television. The LED, which emits light predominantly in the blue spectrum, is shown with two wires connected to its top surface. A layer of phosphor is shown covering the top surface of the LED. The phosphor layer includes particles of green phosphor and red phosphor.



104. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

105. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT IX.

INFRINGEMENT OF THE '662 PATENT

EXAMPLE CLAIM 1

106. Fry's has infringed and continues to infringe one or more claims of the '662 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the RCA LED TV LED60B55R120Q television within the United States or importing the RCA LED TV LED60B55R120Q television into the United States.

107. The RCA LED TV LED60B55R120Q television includes a plurality of LED-based light emitting devices. The image below shows the RCA LED TV LED60B55R120Q television after removal of the liquid crystal display panel, revealing 96 LED-based light emitting devices and their associated lenses.



108. The image is provided below. The image is a cross-section through the frame, chip, and molded resin formed on the frame. As the image shows, the molded resin extends to and is substantially flush with the edges of the frame. The cross-sectional image also shows a layer of particles comprising a fluorescent material covering the LED chip. The fluorescent converts the wavelength emitted by the LED chip to a longer wavelength.



109. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

110. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT X.

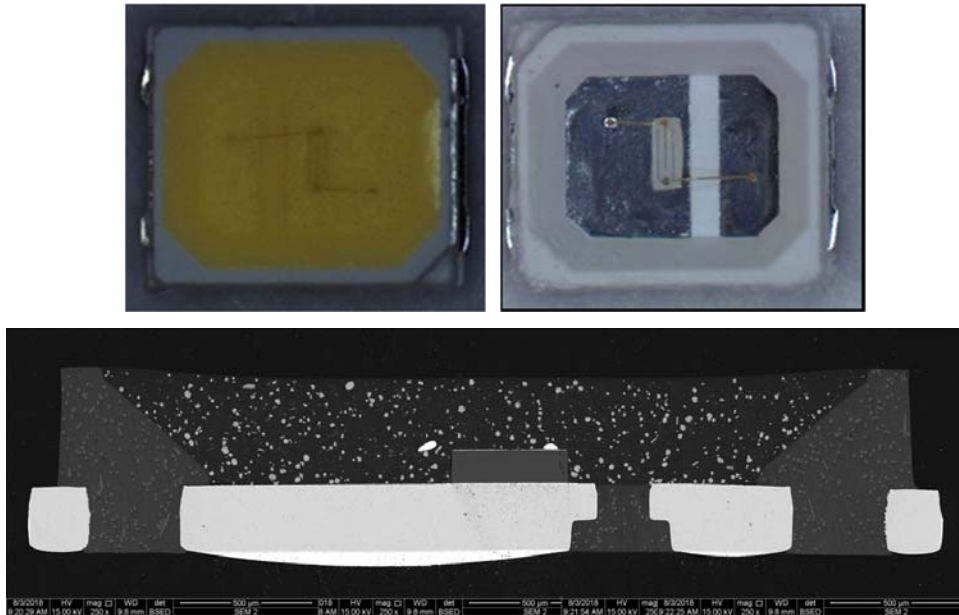
INFRINGEMENT OF THE '157 PATENT

EXAMPLE CLAIM 1

111. Fry's has infringed and continues to infringe one or more claims of the '157 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a), at least by without authority making, using, offering to sell, and/or selling the NTE LED Wall Light 69-LL-10 within the United States or importing the NTE LED Wall Light 69-LL-10 into the United States.

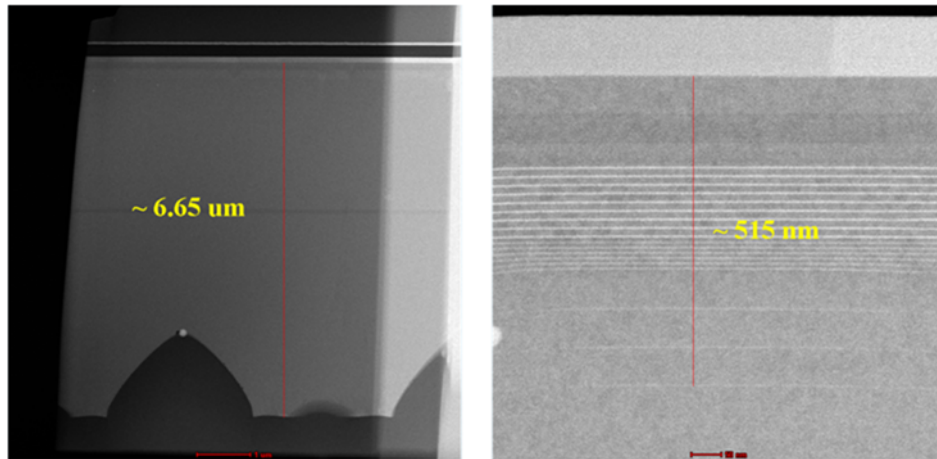
112. The NTE LED Wall Light 69-LL-10 includes a plurality of LED packages, each of which includes a light emitting structure. Three image of a package from an NTE LED Wall Light 69-LL-10 are reproduced below. The image below left shows the package after removal from the

NTE LED Wall Light 69-LL-10. The image below right shows the package after removal of the resin encapsulant. The image at bottom shows a scanning electron microscope image of a cross-section through the package.

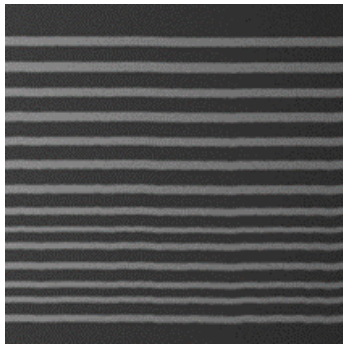


113. The images show the LED mounted on the body of the package and connected to leads. The light emitting diode chip is shown covered by a member comprised of resin. The resin member contains phosphor particles, which can be seen as relatively bright spots within the darker resin.

114. Two transmission electron microscope images of a light emitting structure from the NTE LED Wall Light 69-LL-10 are reproduced below. The image below left shows the entire vertical epi-structure formed above a patterned sapphire substrate. The image below right shows a portion of the epi-structure including from bottom to top, a portion of the n-type semiconductor layer, a multi-quantum well active layer, and a p-type semiconductor layer.



115. The transmission electron microscope image below shows a portion of the distributed Bragg reflector located on the bottom of the substrate. As shown in the below image, the distributed Bragg reflector comprises two portions., an upper portion comprising relatively thick layers of silicon dioxide (“SiO₂”) and titanium dioxide (“TiO₂”) and a lower portion comprising relatively thin layers of SiO₂ and TiO₂. The relatively dark layers comprise SiO₂ and the relatively bright layers comprise TiO₂. The optical thickness of the layers comprising the upper portion are greater than the optical thickness of the layers comprising the lower portion.



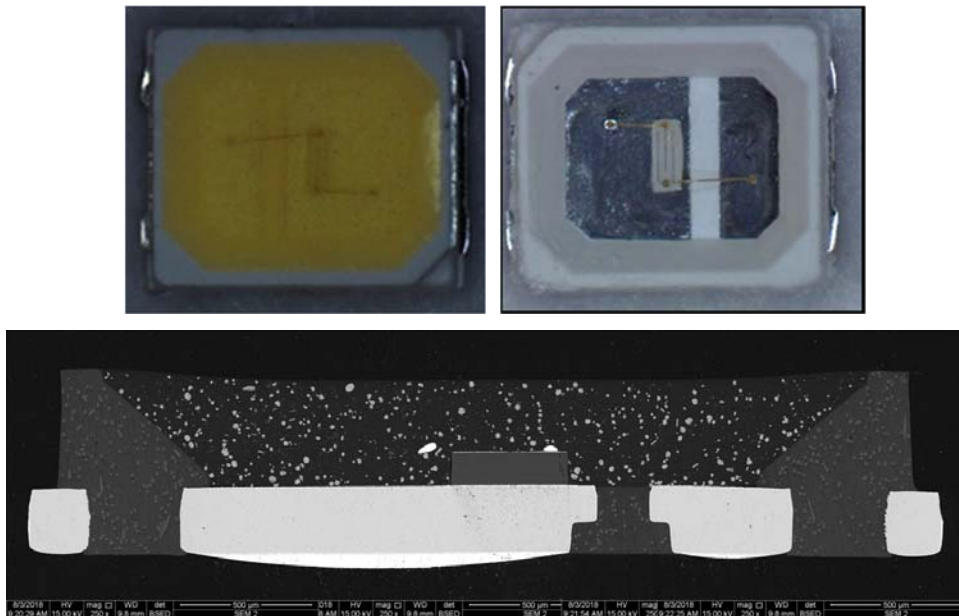
116. Fry’s’ infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

117. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT XI.**INFRINGEMENT OF THE '631 PATENT****EXAMPLE CLAIM 1**

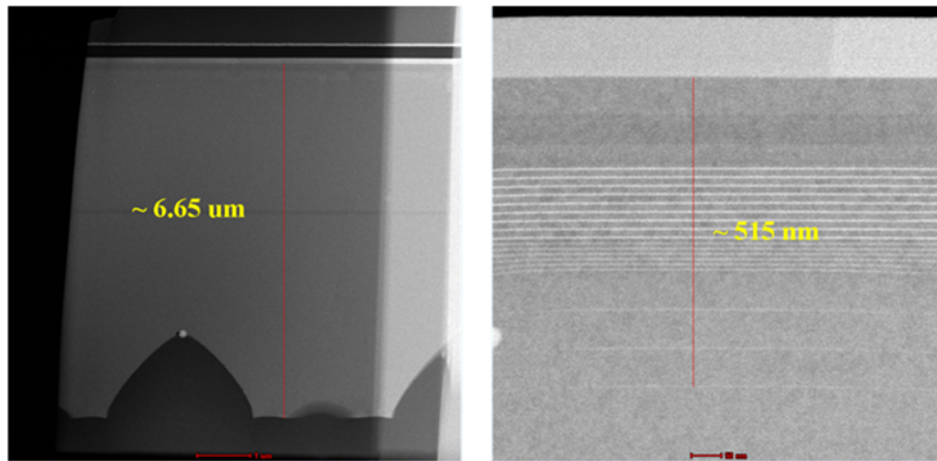
118. Fry's has infringed and continues to infringe one or more claims of the '631 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a), at least by without authority making, using, offering to sell, and/or selling the NTE LED Wall Light 69-LL-10 within the United States or importing the NTE LED Wall Light 69-LL-10 into the United States.

119. The NTE LED Wall Light 69-LL-10 includes a plurality of LED packages, each of which includes a light emitting diode chip. Three images a package from an NTE LED Wall Light 69-LL-10 are reproduced below. The image below left shows the package after removal from the NTE LED Wall Light 69-LL-10. The image below right shows the package after removal of the resin encapsulant. The image at bottom shows a scanning electron microscope image of a cross-section through the package.

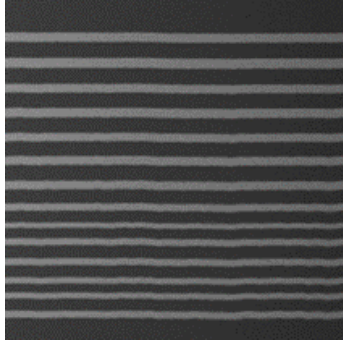


120. The cross-section image above show the LED covered by a member comprised of resin. The resin member contains phosphor particles, which can be seen as relatively bright spots within the darker resin.

121. Two transmission electron microscope images of a light emitting structure from the NTE LED Wall Light 69-LL-10 are reproduced below. The image below left shows the entire vertical epi-structure formed above a patterned sapphire substrate, which comprises a light-emitting structure. The image below right shows a portion of the epi-structure including from bottom to top, a portion of the n-type semiconductor layer, a multi-quantum well active layer, and a p-type semiconductor layer. The multi-quantum well active layer emits light in the shorter blue wavelength range. The above-described phosphor converts a portion of the emitted light to a longer wavelength.



122. The transmission electron microscope image below shows a portion of the distributed Bragg reflector located on the bottom of the substrate. As shown in the below image, the distributed Bragg reflector comprises two portions, an upper portion closer to the substrate comprising relatively thick layers of SiO₂ and TiO₂ and a lower portion further from the substrate comprising relatively thin layers of SiO₂ and TiO₂. The relatively dark layers comprise SiO₂ and the relatively bright layers comprise TiO₂. The upper DBR provides higher reflectivity for the shorter wavelength blue light emitted by the light emitting structure. The lower DBR provides higher reflectivity for the longer wavelength light converted by the phosphor.



123. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

124. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

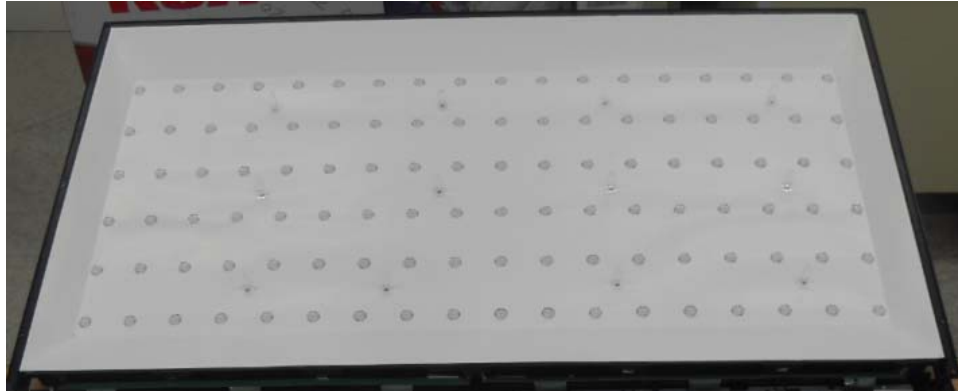
COUNT XII.

INFRINGEMENT OF THE '626 PATENT

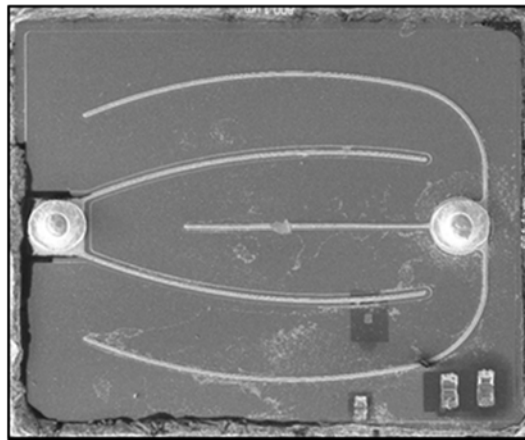
EXAMPLE CLAIM 9

125. On information and belief, Fry's has infringed and continues to infringe at least exemplary claim 9 of the '626 Patent pursuant to 35 U.S.C. § 271(g) at least by without authority importing into the United States or offering to sell, selling, and/or using within the United States the RCA LED TV LED55C55R120Q television, which on information and belief are made by a process that infringes that claim and are not materially changed by subsequent processes and do not become a trivial and nonessential component of another product.

126. The RCA LED TV LED55C55R120Q television includes a plurality of LED-based light emitting devices. The image below shows the RCA LED TV LED55C55R120Q television after removal of the liquid crystal display panel, revealing 108 LED-based light emitting devices and their associated lenses.

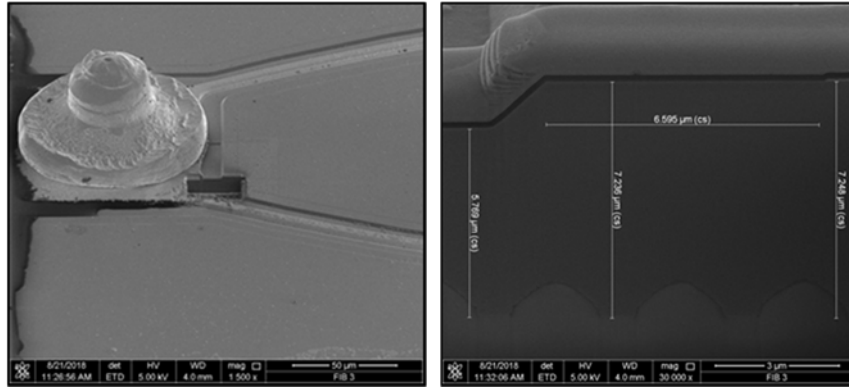


127. Below is a scanning electron microscope image of the top surface of an LED from a RCA LED TV LED55C55R120Q television.



128. The n-pad of the LED is shown as a circular structure toward the center of the left side of the image. The n-pad is formed over an n-type semiconductor layer. The P-pad of the LED is shown as a circular structure toward the center of the right side of the image. The P-pad is formed over a p-type semiconductor layer.

129. As shown in the scanning electron microscope images below, which were created after milling a hole in the LED chip near the n-pad, a mesa having a sloped edge exists at the surface of the LED chip. The mesa comprises a layer of P-type material toward the top, an active layer under the P-type layer, and a layer of n-type material under the active layer. The patterned sapphire substrate can be seen at the bottom of the image below right.



130. In view of the angular slope of the mesa edge, and upon information and belief regarding the process used to manufacture the LED chip, the mesa edge shape was created by forming an etching pattern on the surface, hard-baking the photoresist to create an inclined edge, and etching the photoresist and portions of the surface.

131. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

132. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT XIII.

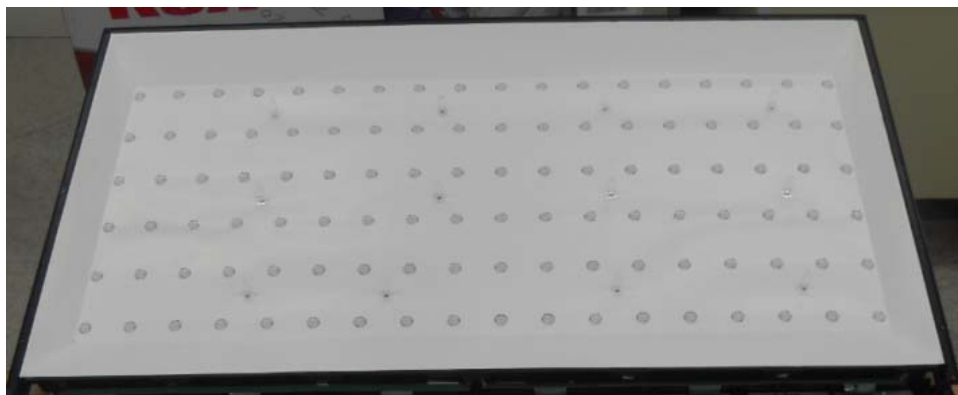
INFRINGEMENT OF THE '800 PATENT

EXAMPLE CLAIM 1

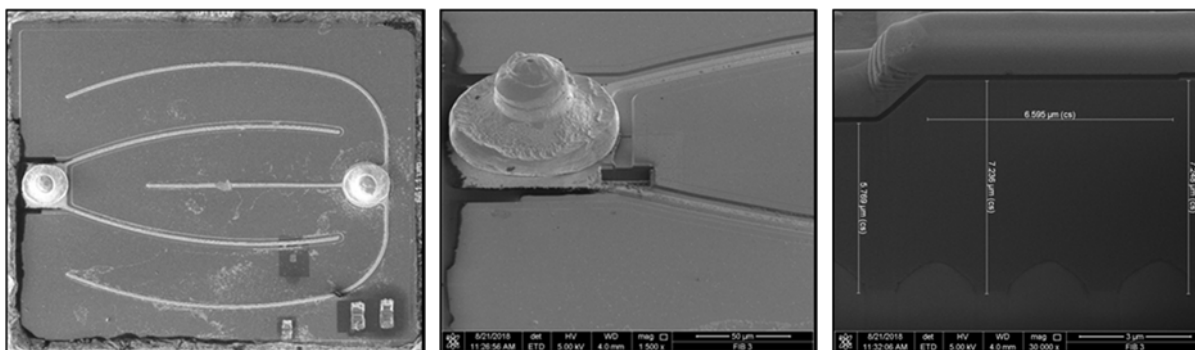
133. Fry's has infringed and continues to infringe one or more claims of the '800 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the RCA LED TV LED55C55R120Q television within the United States or importing the RCA LED TV LED55C55R120Q television into the United States.

134. The RCA LED TV LED55C55R120Q television includes a plurality of LED-based light emitting devices. The image below shows the RCA LED TV LED55C55R120Q television

after removal of the liquid crystal display panel, revealing 108 LED-based light emitting devices and their associated lenses.



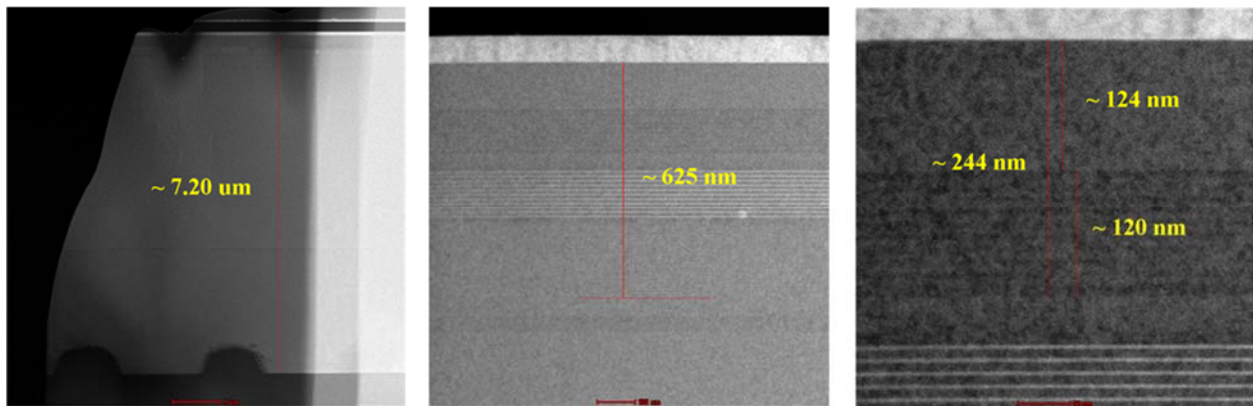
135. Three images of an LED from a RCA LED TV LED55C55R120Q television are reproduced below. The left image is a scanning electron microscope image of the top surface of the LED. The center and right images are scanning electron microscope images created after the creation of a hole in the LED using ion milling. The structure shown on the left side of the first and second images is an n-pad, which sits on top of and in contact with an n-type semiconductor layer. Above the n-type semiconductor layer are an active layer, an electron blocking layer and a p-type semiconductor layer. The active layer comprises a multi-quantum well, with the layers distinguishable by differing levels of Indium dopant. Between the active layer and the p-type layer is an electron blocking layer, which is distinguishable by being relatively free of both Magnesium and Indium dopants.



136. The p-type semiconductor layer of the LED comprises a number of layers. From top to bottom, the layers include a p-type contact layer, a hole transport layer, and a hole injection

layer. The p-type contact layer is distinguishable by a relatively high level of Magnesium dopant near the surface of the LED. Next, a hole transport layer has varying levels of the dopant Magnesium, a first layer with relatively low Magnesium doping, an intermediate layer with relatively high Magnesium doping, and second layer with relatively low Magnesium doping. The level of Magnesium within the first layer with relatively low level doping increases at both ends and decreases toward the middle. The hole injection layer is again distinguishable by relatively high Magnesium doping.

137. Three tunneling electron microscope images of the LED are reproduced below. The image below left shows the full epi-structure above a patterned sapphire substrate. The center image indicates a plurality of layers including from bottom to top an n-type semiconductor layer, a multi-quantum well active layer, and a p-type semiconductor layer. The image below right focusses in on the p-type semiconductor layer and a portion of the multi-quantum well active layer. As the image shows, the p-type semiconductor layer includes a number of layers as described above.



138. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

139. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

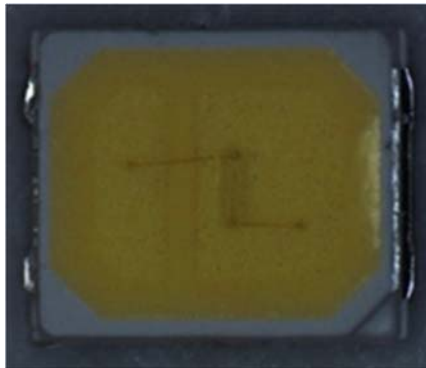
COUNT XIV.

INFRINGEMENT OF THE '210 PATENT

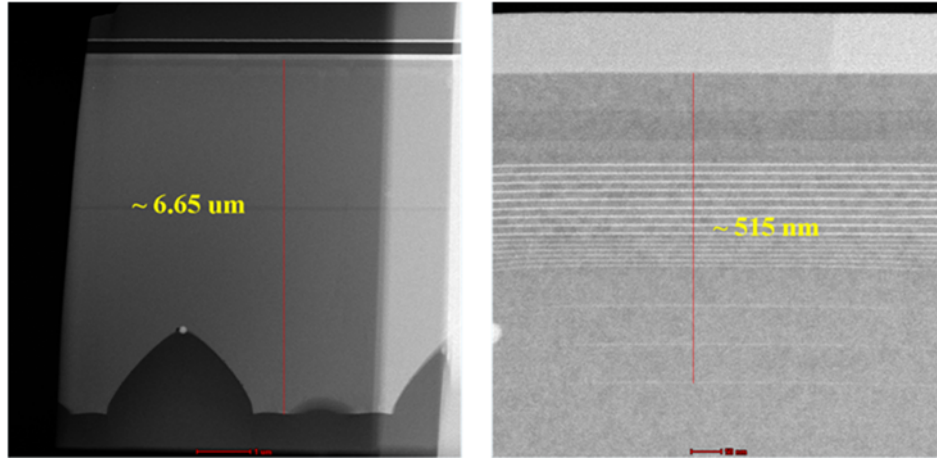
EXAMPLE CLAIM 1

140. Fry's has infringed and continues to infringe one or more claims of the '210 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the NTE LED Wall Light 69-LL-10 within the United States or importing the NTE LED Wall Light 69-LL-10 into the United States.

141. The NTE LED Wall Light 69-LL-10 includes a plurality of LED packages, each of which includes a light emitting diode. The image of an LED from an NTE LED Wall Light 69-LL-10 are reproduced below. The image below shows the LED within package.



142. Below are two transmission electron microscope images of the epi-structure of the LED. The image to the left shows the entire epi-structure above a patterned sapphire substrate. The image below right enlarges the region of the epi-structure around the multi-quantum well active layer. The epi-structure includes from top to bottom in relevant part a p-type contact layer, a multi-quantum well active region, and an n-type contact layer. The active region, which appears as a relatively bright repeating pattern of Indium doped layers separated by relatively dark barrier layers near the center of the image. Below the active region is a superlattice layer, which includes a plurality of layers, and appears as a relatively faint and closely spaced pattern. Below the superlattice is a spacer layer, which includes a plurality of layers, and appears as a relatively faint and widely spaced pattern.



143. Based on the level of Indium doping in the active region, the superlattice layer, and the spacer layer, the spacer layer will have a bandgap smaller than the barrier layers of the multi-quantum well, but higher than the bandgap of the quantum well layers.

144. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

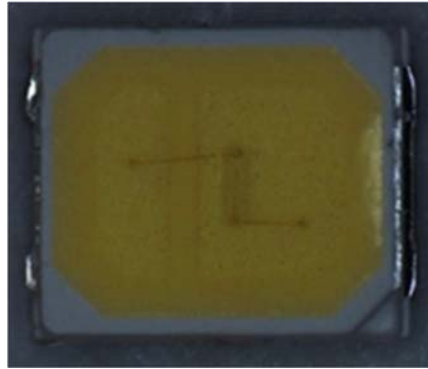
COUNT XV.

INFRINGEMENT OF THE '731 PATENT

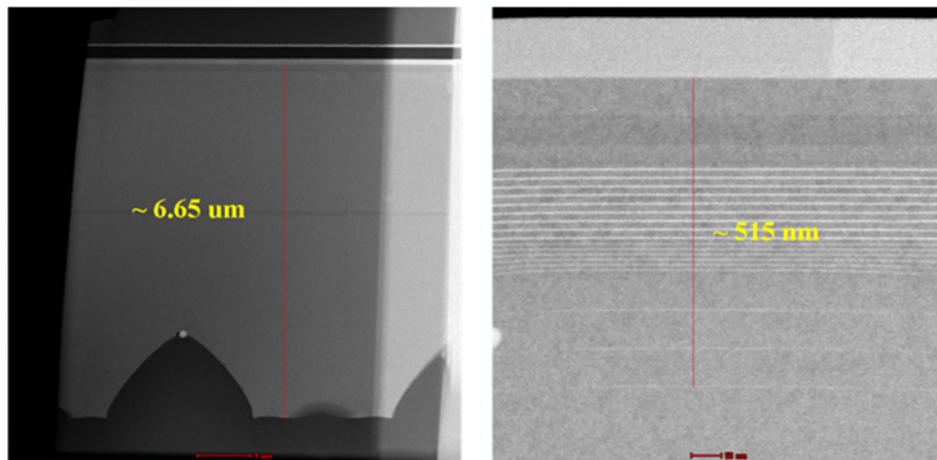
EXAMPLE CLAIM 1

145. On information and belief, Fry's has infringed and continues to infringe at least exemplary claim 1 of the '731 Patent pursuant to 35 U.S.C. § 271(g) at least by without authority importing into the United States or offering to sell, selling, and/or using within the United States the NTE LED Wall Light 69-LL-10, which on information and belief are made by a process that infringes that claim and are not materially changed by subsequent processes and do not become a trivial and nonessential component of another product.

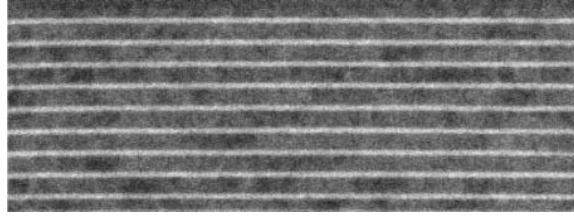
146. The NTE LED Wall Light 69-LL-10 includes a plurality of LED packages, each of which includes a light emitting diode. The image of an LED from an NTE LED Wall Light 69-LL-10 are reproduced below. The image below shows the LED within package.



147. Below are two transmission electron microscope images of the epi structure of the LED. The image to the left shows the entire epi-structure above a patterned sapphire substrate. The image below right enlarges the region of the epi-structure around the multi-quantum well active region.



148. The transmission electron microscope image below further enlarges the multi-quantum well active region, which comprises a plurality of quantum dot layers separated by a plurality of barrier layers. The plurality of quantum dot layers appear as relatively thin and bright layers separated by relatively thick and dark barrier layers.



149. In view of the shape of the individual quantum dot layers, and upon information and belief regarding the process used to manufacture the LED chip, the manufacturing process included growth interruption after each layer of coherent quantum dots had been overgrown with a layer of semiconductor material at least thick enough to completely cover all the quantum dots.

150. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

151. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT XVI.

INFRINGEMENT OF THE '664 PATENT

EXAMPLE CLAIM 1

152. Fry's has infringed and continues to infringe one or more claims of the '664 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the Philips 55PFL5402/F7 television within the United States or importing the Philips 55PFL5402/F7 television into the United States.

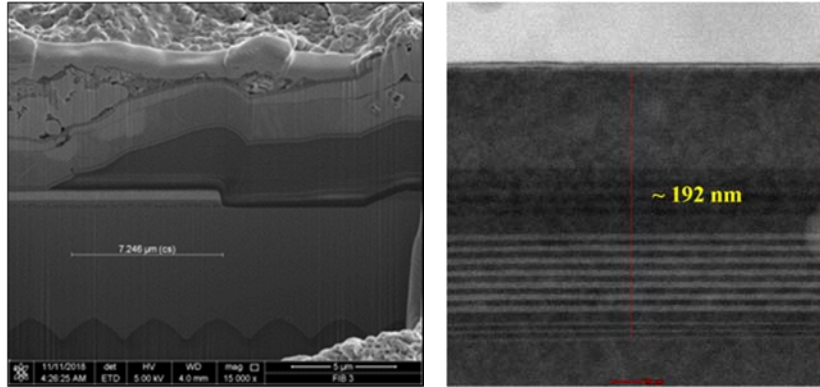
153. The 55PFL5402/F7 television includes a plurality of packaged light emitting diodes. An image of the inside of the back surface of the 55PFL5402/F7 television is reproduced below showing packaged LEDs.



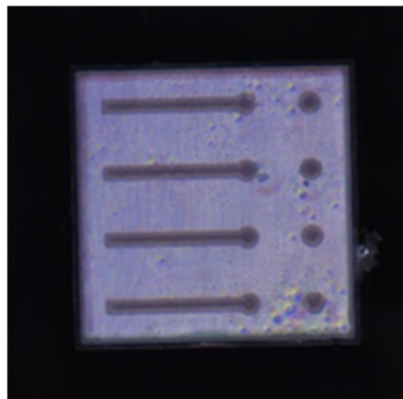
154. A single packaged LED is shown below left after the removal of a covering lens and an enlarged view is shown below right.



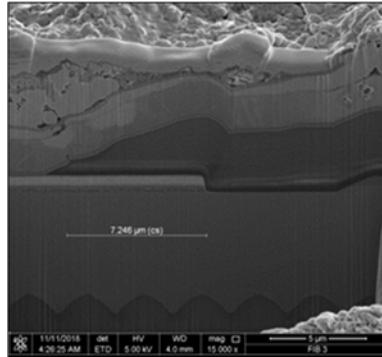
155. The image below shows an electron microscope image of the side surface of a hole milled into the light emitting diode chip removed from the 55PFL5402/F7 television. The middle of the far right side of the image shows a pair of conductive type semiconductor layers positioned above and below a multi-quantum well active layer. An enlarged view of the layers is provided in the transmission electron microscope image below right.



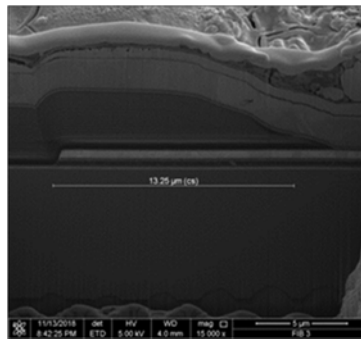
156. The image below shows the locations of a plurality of contact holes that extend through the first conductive type semiconductor layer and active layer of a light emitting diode chip removed from the 55PFL5402/F7 television. The plurality of holes expose the second conductive type semiconductor layer.



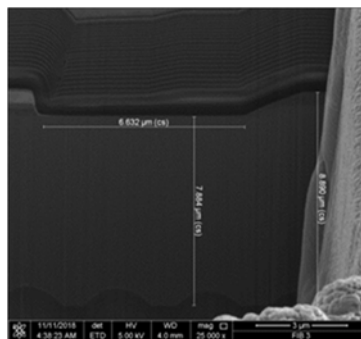
157. The image below shows an electron microscope image of the side surface of a hole milled into the light emitting diode chip removed from the 55PFL5402/F7 television. The relatively lightly colored rectangle in the center of the left side of the image is a first electrode pad arranged over a first side of the semiconductor stack. The first electrode pad is electrically connected to the first conductive type semiconductor layer via contact holes.



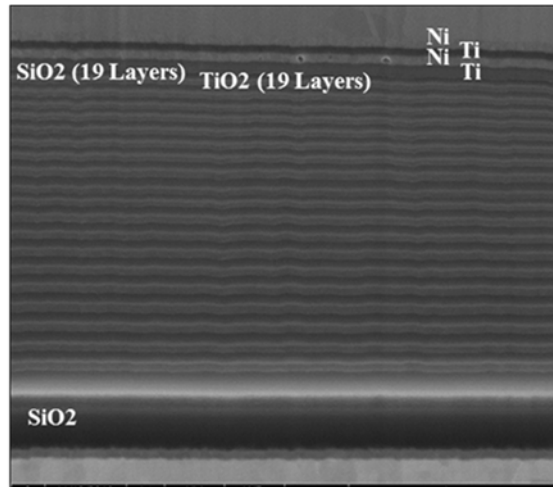
158. Similarly, the image below shows an electron microscope image of the side surface of a hole milled into the light emitting diode chip removed from the 55PFL5402/F7 television. The relatively lightly colored rectangle extending across the middle of the image is a second electrode pad arranged over the first side of the semiconductor stack. The second electrode pad is electrically connected to the second conductive type semiconductor layer.



159. The image below shows an electron microscope image of the side surface of a hole milled into the light emitting diode chip removed from the 55PFL5402/F7 television. The top of the image shows multiple layers of a protective insulation layer covering a sidewall of the first conductive type semiconductor layer and the second conductive type semiconductor layer.



160. The image below focusses in on a portion of the protective layer showing a plurality of interleaved insulation layers. The interleaved layers comprise relatively thick layers of SiO₂ and relatively thin layers of TiO₂, which have different indices of refraction.



161. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

162. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT XVII.

INFRINGEMENT OF THE '939 PATENT

EXAMPLE CLAIM 1

163. Fry's has infringed and continues to infringe one or more claims of the '939 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the Philips 55PFL5402/F7 television within the United States or importing the Philips 55PFL5402/F7 television into the United States.

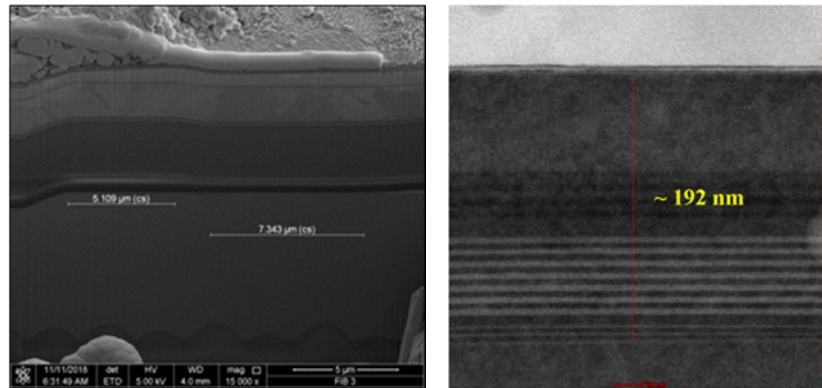
164. The 55PFL5402/F7 television includes a plurality of light emitting diodes. An image of the inside of the back surface of the 55PFL5402/F7 television is reproduced below showing a plurality of LEDs.



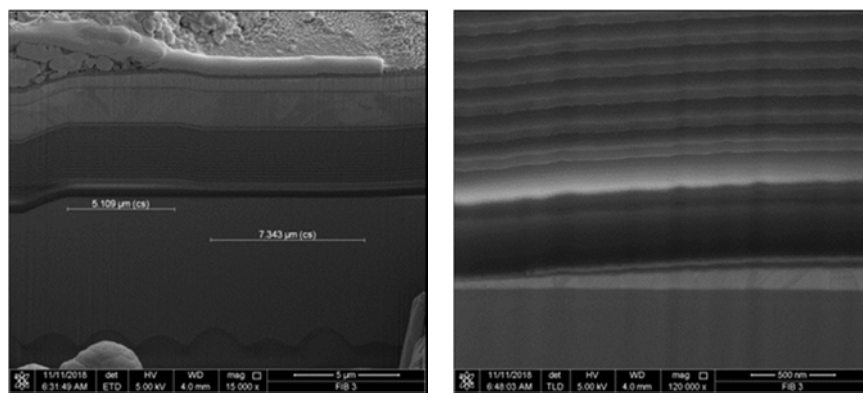
165. A single LED is shown below left after the removal of a covering lens and an enlarged view is shown below right.



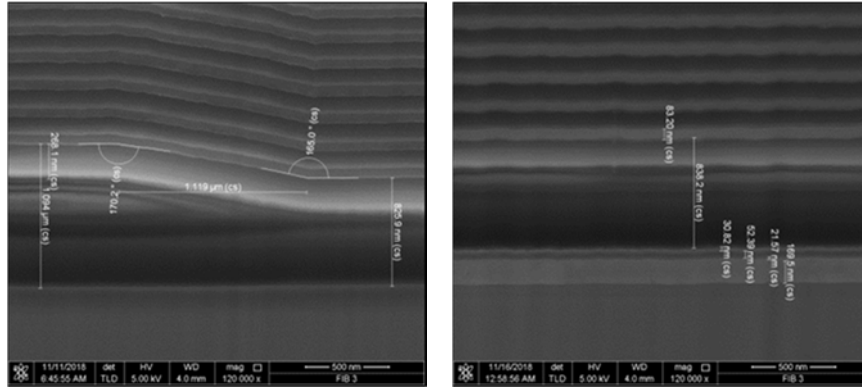
166. The image below left shows an electron microscope image of the side surface of a hole milled into the light emitting diode chip removed from the 55PFL5402/F7 television. The image shows, in relevant part, from bottom to top: a substrate, a first semiconductor layer, an active layer, and a second semiconductor layer. An enlarged view of portions of the first semiconductor layer, multi-quantum well active layer, and second semiconductor layer is provided in the transmission electron microscope image below right.



167. The image below left again shows the side surface of the milled hole. The image below right focusses in on the center of the far right side of the left image. The bottom layer in the image below right is a portion of the second semiconductor layer. Above the second semiconductor layer is a reflection pattern.



168. The images below again show the side surface of the milled hole at different locations. In both images, the bottom most layer comprises the second semiconductor layer. The images also show an insulating layer having different thicknesses. In particular, the insulating layer is thicker in the left image below than in the right image below. In addition, the image below right includes the reflective pattern between the insulating layer and the semiconductor layer, whereas the image below left does not include the reflective pattern between the insulating layer and the semiconductor layer.



169. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

170. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

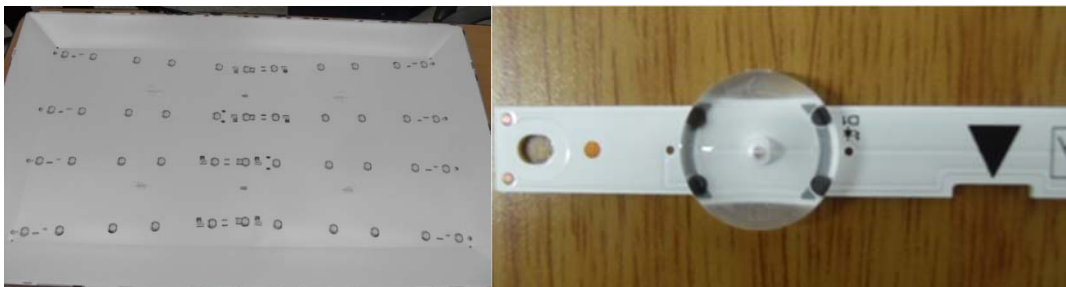
COUNT XVIII.

INFRINGEMENT OF THE '356 PATENT

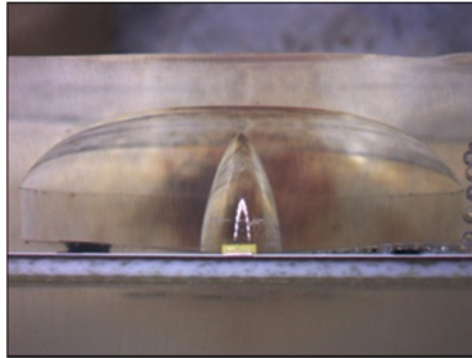
EXAMPLE CLAIM 1

171. Fry's has infringed and continues to infringe one or more claims of the '356 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the Philips 55PFL5402/F7 television within the United States or importing the Philips 55PFL5402/F7 television into the United States.

172. The 55PFL5402/F7 television includes a plurality of illumination lenses. An image of the inside of the back surface of the 55PFL5402/F7 television is reproduced below left showing a plurality of lens-covered LEDs. The image below right shows a single lens mounted over an light emitting element.



173. The image below is a cross-section through a lens and its associated light emitting element. The open space between the light emitting element and the lens is a rotationally symmetric cavity. Light from the light emitting element intersects the surface of the cavity to pass into the lens, with the cavity surface acting as a light incident surface.



174. As shown in the cross-sectional image above, the lens also has an light exit surface comprising the sides and upper surface of the lens. At the center of the light output surface is an area comprising a flat surface. When viewed in cross-section, the flat surface, which appears as a short horizontal line, has an infinite intersecting point with a horizontal axis vertical (*i.e.*, perpendicular) to the central axis. Moving laterally away from the central flat area, the light exit surface becomes a convex surface.

175. The cross-sectional image above also shows that the lens has a bottom surface that connects the light incident surface at the center of the bottom of the lens to the light exiting surface. The lowest points of the bottom surface, when viewed in cross-section, are the two points where the bottom surface intersects the light incident surface. In addition, rather than a flat bottom surface, the bottom surface is an inclined surface with respect to the horizontal axis.

176. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

177. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

COUNT XIX.

INFRINGEMENT OF THE '448 PATENT

EXAMPLE CLAIM 1

178. Fry's has infringed and continues to infringe one or more claims of the '448 Patent, including but not limited to exemplary claim 1, pursuant to 35 U.S.C. § 271(a) at least by without authority making, using, offering to sell, and/or selling the Philips 55PFL5402/F7 television within the United States or importing the Philips 55PFL5402/F7 television into the United States.

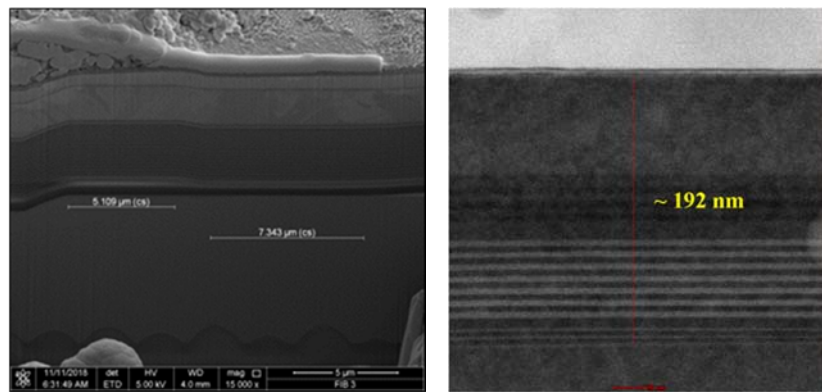
179. The 55PFL5402/F7 television includes a plurality of light emitting diodes. An image of the inside of the back surface of the 55PFL5402/F7 television is reproduced below showing a plurality of light emitting diodes.



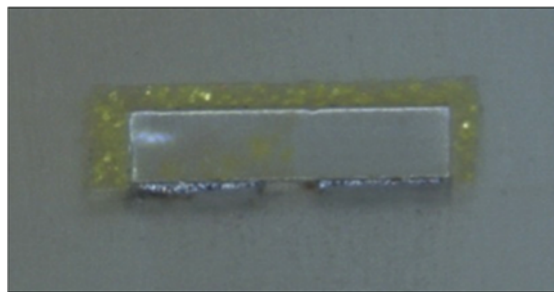
180. A single light emitting diode is shown below left after the removal of a covering lens and an enlarged view is shown below right.



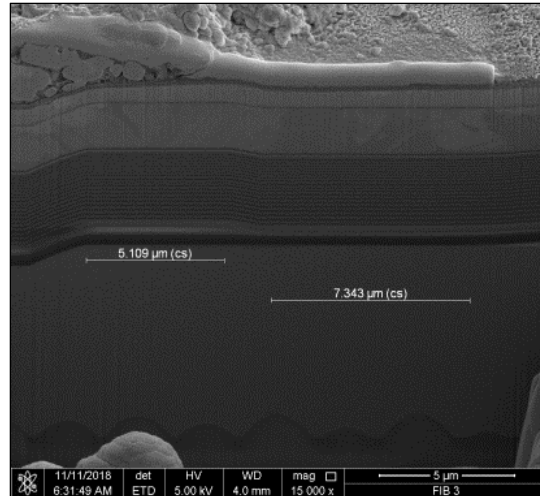
181. The image below left shows an electron microscope image of the side surface of a hole milled into the light emitting diode chip removed from the 55PFL5402/F7 television. The image shows, in relevant part, from bottom to top: a substrate, a first conductivity-type semiconductor layer, an active layer, and a second conductivity-type semiconductor layer. The final three together are a semiconductor stacked structure. An enlarged view of portions of the first conductivity-type semiconductor layer, multi-quantum well active layer, and second conductivity-type semiconductor layer is provided in the transmission electron microscope image below right.



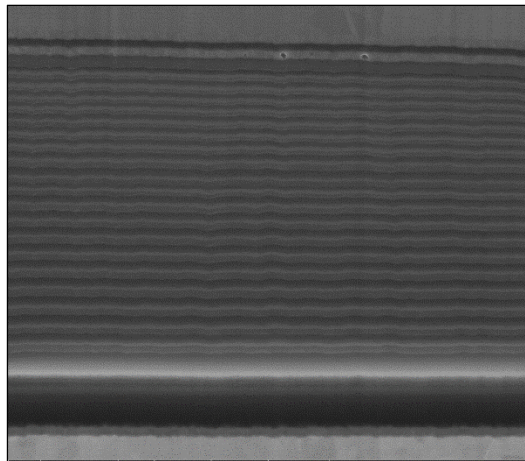
182. The image below is a cross section through the light emitting diode. The yellow material above and on the sides of the light emitting diode is a wavelength converting layer, which converts the wavelength of light emitted from the semiconductor stacked structure



183. The image below shows an electron microscope image of the side surface of a hole milled into the light emitting diode chip removed from the 55PFL5402/F7 television. The image shows thin interleaved layers of SiO_2 and TiO_2 that comprise a distributed Bragg reflector. The layers of SiO_2 and TiO_2 have different indices of refraction. The layers comprising the distributed Bragg reflector reflect the light output by the wavelength converting layer.



184. Focusing in on a portion of the above side surface, a metal layer is shown covering a portion of the distributed Bragg reflector to reflect light transmitted through the distributed Bragg reflector.



185. Fry's' infringement has caused and is continuing to cause damage and irreparable injury to Plaintiffs. Plaintiffs will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

186. Plaintiffs are entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs respectfully requests that this Court enter judgment in its favor and against Fry's as follows:

A. A declaration that Fry's has infringed the '552 Patent, '212 Patent, '113 Patent, '947 Patent, '618 Patent, '328 Patent, '162 Patent, '952 Patent, '662 Patent, '157 Patent, '631 Patent, '626 Patent, '800 Patent, '210 Patent, and '731 Patent under 35 U.S.C. § 271, and a final judgment incorporating the same;

B. A permanent injunction, enjoining Fry's and its officers, agents, servants, employees, representatives, successors, and assigns, and all others acting in concert or participation with them from continued infringement under 35 U.S.C. § 271 of the '552 Patent, '212 Patent, '113 Patent, '947 Patent, '618 Patent, '328 Patent, '162 Patent, '952 Patent, '662 Patent, '157 Patent, '631 Patent, '626 Patent, '800 Patent, '210 Patent, and '731 Patent;

C. An award of damages adequate to compensate Plaintiffs for Fry's' infringement the '552 Patent, '212 Patent, '113 Patent, '947 Patent, '618 Patent, '328 Patent, '162 Patent, '952 Patent, '662 Patent, '157 Patent, '631 Patent, '626 Patent, '800 Patent, '210 Patent, and '731 Patent, together with prejudgment and post-judgment interest and costs pursuant to 35 U.S.C. § 284;

D. An accounting of all infringing sales and other infringing acts by Fry's, and an order compelling an accounting for infringing acts not presented at trial and an award by the Court of additional damages for such acts; and

E. Any other relief to which Plaintiffs are entitled or that the Court seems just and proper.

JURY DEMAND

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiffs hereby demand trial by jury of all issues so triable.

DATED: November 20, 2018

Respectfully submitted,
HOLLAND & KNIGHT LLP

By /s/ Michael B. Eisenberg
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