UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

In The Matter Of	
CERTAIN LED PACKAGES CONTAINING PFS PHOSPHOR AND PRODUCTS CONTAINING SAME	**Investigation No. 337-TA-___**

COMPLAINT OF GENERAL ELECTRIC CO., CURRENT LIGHTING SOLUTIONS, LLC, AND CONSUMER LIGHTING (U.S.), LLC UNDER SECTION 337 OF THE TARIFF ACT OF 1930, AS AMENDED

COMPLAINANTS:
Current Lighting Solutions, LLC
1975 Noble Road
Building 338
Nela Park
East Cleveland, Ohio 44112
Tel.: +1 216 296 5887

General Electric Co.
41 Farnsworth St.
Boston, MA 02210
Tel.: +1 617 443 3000

Consumer Lighting (U.S.), LLC
d/b/a GE Lighting
1975 Noble Road
Building 338
East Cleveland, Ohio 44112
Tel.: +1 216 266 2121

PROPOSED RESPONDENTS:
Cree, Inc.
4600 Silicon Drive
Durham, N.C. 27703 USA
Tel.: +1 919 313 5300

Cree Hong Kong Ltd.
18 Science Park East Avenue
Hong Kong Science Park,
Shatin, New Territories,
Hong Kong
Tel.: +852 2424 8228

Cree Huizhou Solid State Lighting Co. Ltd.
No. 32 Zhong Kai High
Tech Development Park
830000
Huizhou, Guangdong 516006
China

COUNSEL FOR COMPLAINANTS
Richard L. Rainey
Sturgis M. Sobin
Shara L. Aranoff
Peter A. Swanson
Jay I. Alexander
Jared Frisch
Augustus Golden
COVINGTON & BURLING LLP
One CityCenter
850 Tenth Street NW
Washington, DC 20001
Tel.: +1 202 662 6000

(Listing of Counsel Continues on Next Page)

Elizabeth S. Pehrson
COVINGTON & BURLING LLP
3000 El Camino Real
5 Palo Alto Square
Palo Alto, CA 94306
Tel.: +1 650 632 4700

Sinan Utku
COVINGTON & BURLING LLP
265 Strand
London WC2R 1BH
Tel.: +44 20 7067 2000

TABLE OF CONTENTS

I. INTRODUCTION 1

II. COMPLAINANTS 5

III. PROPOSED RESPONDENTS 6

A. Cree, Inc. 6

B. Cree Hong Kong Limited 6

C. Cree Huizhou Solid State Lighting Company Limited 7

IV. THE ACCUSED PRODUCTS-AT-ISSUE 8

V. THE ASSERTED PATENTS 9

A. U.S. Patent No. 7,497,973 9

1. Identification of the Patent and Ownership by Current Lighting Solutions, LLC and General Electric Co. 9

2. Non-Technical Description of the Patented Invention 10

3. Foreign Counterparts to the '973 Patent 11

B. U.S. Patent No. 9,680,067 12

1. Identification of the Patent and Ownership by Current Lighting Solutions, LLC 12

2. Non-Technical Description of the Patented Invention 13

3. Foreign Counterparts to the '067 Patent 13

VI. UNLAWFUL AND UNFAIR ACTS – PATENT INFRINGEMENT 15

A. Representative Involved Article 15

B. Infringement of the '973 Patent 18

C. Infringement of the '067 Patent 18

D. Specific Instances of Sale and Importation 19

VII. CLASSIFICATION OF THE ACCUSED PRODUCTS UNDER THE HARMONIZED TARIFF SCHEDULE 21

VIII. LICENSEES 21

IX. COMPLAINANTS SATISFY THE DOMESTIC INDUSTRY REQUIREMENT 21

A. The Technical Prong of the Domestic Industry Requirement Is Satisfied 22

1. Practice of the '973 Patent 23

2. Practice of the '067 Patent 23

B. The Economic Prong of the Domestic Industry Requirement is Satisfied 23

1. Significant Investments in Plant and Equipment for the Manufacture of a Key Component of the Patented Invention 24

2. Significant Employment of Labor and Capital for the Manufacture of a Key Component of the Patented Invention 26

3. Significant Employment of Labor and Capital in the Research and Development of the Patented Invention 27

4. Substantial Investment in the Exploitation of the '973 Patent Through Licensing 29

X. RELATED LITIGATION 30

XI. REQUESTED RELIEF 31

LIST OF EXHIBITS

Exhibit No.	Document Description
1	Certified Copy of U.S. Patent No. 7,497,973
2	Certified Copy of U.S. Patent No. 9,680,067
3	Certified Copy of Assignment for U.S. Patent No. 7,497,973 (Assignment 1)
4	Certified Copy of Assignment for U.S. Patent No. 7,497,973 (Assignment 2)
5	Certified Copy of Assignment for U.S. Patent No. 7,497,973 (Assignment 3)
6	Certified Copy of Assignment for U.S. Patent No. 7,497,973 (Assignment 4)
7	Certified Copy of Assignment for U.S. Patent No. 9,680,067
8	List of Foreign Counterparts for U.S. Patent No. 7,497,973
9	List of Foreign Counterparts for U.S. Patent No. 9,680,067
10	Tomas Kellner, *Remember the Light Bulb? LEDs are Sending the Bulb's Classic Shape the Way of the LP* (dated June 2, 2015), *available at* https://www.ge.com/reports/post/120527837870/remember-the-light-bulb-leds-are-sending-the/
11C	Declaration of William Cohen **(CONFIDENTIAL)**
12C	Tripartite License Agreement **(CONFIDENTIAL)**
13	Cree, Inc., Annual Report (Form 10-K) (Aug. 20, 2018)
14	*Cree, Inc. v. MSi Lighting, Inc.*, No. 1:15-cv-00706 (M.D.N.C. Aug. 27, 2015), ECF No. 1)
15	Cree Hong Kong Limited: Private Company Information, *Company Overview of Cree Hong Kong Limited*, *available at* BLOOMBERG, *available at* https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=23063145 (last visited Mar. 11, 2019)
16	Cree, Inc., Annual Report (Form 10-K) (Aug. 18, 2010)
17	*Cree to Acquire COTCO Luminant Device Ltd.*, CREE.COM, *available at* http://investor.cree.com/news-releases/news-release-details/cree-acquire-cotco-luminant-device-ltd (last visited Mar. 11, 2019)
18	Company Overview of Cree Huizhou Solid State Lighting Company Limited, Bloomberg, *available at* https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapid=154010064 (last visited Mar. 11, 2019)
19	Tim Whitaker, *Cree Opens LED Chip Manufacturing Facility in Huizhou*, LEDs Magazine (Dec. 13, 2010), *available at* https://www.ledsmagazine.com/articles/2010/12/cree-opens-led-chip-manufacturing-facility-in-huizhou.html.
20	A List of Accused Products
21	U.S. Patent No. 9,530,944

Exhibit No.	Document Description
22	Excerpt from U.S. Patent Application No. 15/184,104 (Information Disclosure Statement, dated June 15, 2016)
23	Excerpt from U.S. Patent Application No. 14/298,327 (Information Disclosure Statement, dated Oct. 26, 2015)
24	Excerpt from U.S. Patent Application No. 15/832,848 (Information Disclosure Statement, dated Dec. 6, 2017)
25	GE Light, *TriGain™ Phosphor: Simple, High-Performance Red for LED Backlighting, available at* https://products.currentbyge.com/sites/products.currentbyge.com/files/documents/document_file/MISC020-GE-TriGain-Phosphor-for-LED-Screens-Whitepaper.pdf (last visited Mar. 11, 2019)
26	An Excerpt from "Where to Buy" section, *available at* https://www.cree.com/led-components/where-to-buy (last visited Mar. 11, 2019)
27	Cree® XLamp® CMA1516 LED Datasheet, *available at* https://www.cree.com/led-components/media/documents/ds-CMA1516.pdf (last visited Mar. 11, 2019)
28	Declaration of Danute Abrishami
29C	Declaration of Ashfaqul Chowdhury, Ph.D. **(CONFIDENTIAL)**
30	Cree® XLamp® CMT1922 LED Datasheet, *available at* https://www.cree.com/led-components/media/documents/data-sheet-CMT1922.pdf (last visited Mar. 11, 2019)
31C	Claim Chart of Infringement of the U.S. Patent No. 7,497,973 **(CONFIDENTIAL)**
32C	Claim Chart of Infringement of the U.S. Patent No. 9,680,067 **(CONFIDENTIAL)**
33	*China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation Before the Office of the United States Trade Interagency Section 301 Committee* (May 16, 2018) (statement of Greg Merritt, Vice President of Marketing and Public Affairs, Cree, Inc.)
34C	List of Entities to which GE has licensed the U.S. Patent No. 7,497,973 **(CONFIDENTIAL)**
35C	Claim Chart re Practice of U.S. Patent No. 7,497,973 by Domestic Industry Product **(CONFIDENTIAL)**
36C	Claim Chart re Practice of U.S. Patent No. 7,497,973 by Domestic Industry Product **(CONFIDENTIAL)**
37C	Claim Chart re Practice of U.S. Patent No. 9,680,067 by Domestic Industry Product **(CONFIDENTIAL)**
38C	Declaration of Douglas J. Naab **(CONFIDENTIAL)**
39	Printout of record from Delaware Secretary of State, Division of Corporations (showing change of name from GE Lighting Solutions, LLC to Current Lighting Solutions, LLC on 4/1/2019)

Exhibit No.	Document Description
Physical Exhibit A	Two physical specimens of Cree CMA1516-0000-00PN0U0A30G (Cree® XLamp® CMA1516 LED) LED package

LIST OF APPENDICES

Appendix No.	Document Description
A	U.S. Patent No. 7,497,973 Certified Prosecution History
B	U.S. Patent No. 7,497,973 References
C	U.S. Patent No. 9,680,067 Certified Prosecution History
D	U.S. Patent No. 9,680,067 References

I. INTRODUCTION

1. Complainants Current Lighting Solutions, LLC ("Current"), General Electric Company ("GE"), and Consumer Lighting (U.S.), LLC ("Consumer Lighting") (collectively, "Complainants") request that the United States International Trade Commission institute an investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("Section 337"), to remedy the unlawful importation, sale for importation, and/or sale after importation of certain LED ("Light Emitting Diode") packages containing PFS phosphor and products containing the same (collectively, the "Accused Products"). The Accused Products infringe Complainants' patent rights under one or more claims of United States Patent No. 7,497,973 (the "'973 Patent") and one or more claims of United States Patent No. 9,680,067 (the "'067 Patent") (collectively, the "Asserted Patents").[1]

2. The proposed Respondents are: (a) Cree, Inc., (b) Cree Hong Kong Limited, and (c) Cree Huizhou Solid State Lighting Company Limited (collectively, "Respondents").

3. GE's engineers have worked at the forefront of innovation in the lighting and illumination field for over 125 years. Building on the first carbon filament light bulb invented by Thomas Edison in 1879 (as shown in the image below), GE pioneered the machine-blown light bulb (1892), the ductile tungsten filament used in modern incandescent bulbs (1909), the

[1] Certified copies of the Asserted Patents accompany this Complaint as Exhibits 1 and 2.

fluorescent lamp (1938), the halogen lamp (1959), and the first LED to emit visible light (1962).[2]

4. GE bulbs have illuminated numerous historic settings and events including the first commercial lighting on a steamship (1890), the first large-scale application of electronic lighting controls, installed for the Chicago Civic Opera (1929), the first night game in major league baseball (1935), and the first lighting of Niagara Falls (1979). Indeed, the shape of the

[2] *See* Exhibit 10, Tomas Kellner, *Remember the Light Bulb? LEDs are Sending the Bulb's Classic Shape the Way of the LP* (dated June 2, 2015), *available at* https://www.ge.com/reports/post/120527837870/remember-the-light-bulb-leds-are-sending-the/.

incandescent light bulb—which still resembles Thomas Edison's original design—has become a cultural symbol for innovation and bright ideas.

5. Current, a former subsidiary of GE, is a separate business as of April 1, 2019, and carries with it much of the legacy of GE's lighting innovation. GE's remaining lighting business is conducted by its Consumer Lighting subsidiary. Consumer Lighting focuses on residential and consumer applications, such as residential light bulbs, while Current focuses on applications for the commercial and industrial markets. Together, Current and Consumer Lighting earned revenue of over $1.7 billion in 2018.

6. In recent years, Current and GE have had particular success with their patented TriGain™ LED technology. This technology, which is protected by the Asserted Patents (among others), addresses the longstanding problem of how to deliver improved LED color rendering at the higher efficiencies required by commercial customers. Color rendering—*i.e.*, how a light source makes the color of an object appear to human eyes—is important to many commercial and industrial customers, because more accurate color rendering can make food look fresher or clothes more attractive (thus driving increased sales), enable precise mixing and selection of paint colors in a factory, or enhance visual inspection of a finished product. Prior to TriGain™, high levels of color rendering generally came at the cost of lower efficiency (*i.e.*, lower light output per energy input), meaning that the fixtures did not provide enough light for commercial purposes and/or were too expensive for commercial applications.

7. First introduced to the commercial market in 2015, TriGain™ represents the culmination of over ten years of research. Since their release, sales of TriGain™ fixtures have grown at a rapid pace, representing an exponentially increasing portion of Current and GE's revenue for the relevant market segment. Exhibit 11C (Declaration of William Cohen) ¶ 23.

8. On information and belief, Complainants assert that Respondents have engaged in unfair acts in violation of Section 337 through and in connection with the unlicensed importation into the United States, sale for importation into the United States, and/or sale within the United States after importation of the Accused Products.

9. The Accused Products directly infringe at least the following claims of the Asserted Patents: claims 1, 2, 3, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, and 22 of the '973 Patent, either literally or under the doctrine of equivalents; and claims 1, 3, 4, 7, 11, and 12 of the '067 Patent, either literally or under the doctrine of equivalents (collectively, the "Asserted Claims").

10. Current and GE each own an undivided one-half right, title and interest in and to the '973 Patent, and thus together jointly own by assignment the entire right, title, and interest in and to this patent. Current owns by assignment the entire right, title, and interest in and to the '067 Patent.[3] The '973 Patent is subject to a license agreement defining certain rights as between Current, GE, and Consumer Lighting. *See* Exhibit 12C (Tripartite License Agreement).

11. Complainants request a permanent limited exclusion order, pursuant to Section 337(d), excluding from entry into the United States all of the Accused Products that infringe one or more of the Asserted Claims of the Asserted Patents. Complainants also seek a permanent cease and desist order, pursuant to Section 337(f), directing all Respondents to cease and desist from activities that include, but are not limited to, offering for sale, selling, importing, transferring, distributing, warehousing inventory for distribution, using, assembling, advertising, marketing, demonstrating, qualifying for use in the products of others, testing, or installing the

[3] Certified copies of the recorded assignments for the '973 Patent and the '067 Patent accompany this Complaint as Exhibits 3, 4, 5, 6 and 7.

Accused Products and/or products containing the Accused Products that infringe one or more of the Asserted Claims of the Asserted Patents. Complainants further request that the Commission impose a bond during the 60-day Presidential review period pursuant to 19 U.S.C. § 1337(j)(3) to prevent further injury to Complainants' domestic industry relating to the Asserted Patents.

II. COMPLAINANTS

12. Complainant Current Lighting Solutions, LLC ("Current") is a Delaware Limited Liability Company having its principal place of business located at 1975 Noble Road, Nela Park, East Cleveland, Ohio 44112. Current is a leading provider of energy efficiency and digital productivity solutions for commercial facilities and offices, retail stores, and industrial sites. Its commercial technology portfolio includes LED and traditional lighting solutions, plus a wide variety of connected sensors, controls and software.

13. Complainant General Electric Company ("GE") is a New York corporation with its principal place of business at 41 Farnsworth Street, Boston, Massachusetts 02210. General Electric Company is a global digital industrial company that leads new paradigms in additive manufacturing, materials science, and data analytics.

14. Complainant Consumer Lighting (U.S.), LLC, d/b/a GE Lighting ("Consumer Lighting") is a Delaware Limited Liability Company having its principal place of business located at 1975 Noble Road, Nela Park, East Cleveland, Ohio 44112, and is a subsidiary of General Electric Company. Consumer Lighting focuses on driving innovation and growth in LED and connected home technology in the consumer market.

III. PROPOSED RESPONDENTS

A. Cree, Inc.

15. Cree, Inc. is a publicly traded corporation organized under the laws of North Carolina, with its principal place of business at 4600 Silicon Drive, Durham, North Carolina. Exhibit 13 (Cree, Inc., Annual Report (Form 10-K) (Aug. 20, 2018)).

16. Cree, Inc. designs, develops, and manufactures LED lighting components, and sells such LED lighting components to retailers and other manufacturers of lighting products in the United States and abroad. *See* Exhibit 14 (Complaint ¶ 11, *Cree, Inc. v. MSi Lighting, Inc.*, No. 1:15-cv-00706 (M.D.N.C. Aug. 27, 2015), ECF No. 1).

17. On information and belief, Cree, Inc. designs, develops, imports into the United States, sells for importation into the United States, and/or sells after importation into the United States the Accused Products, and/or knowingly induces such activity.

B. Cree Hong Kong Limited

18. Cree Hong Kong Limited is organized under the laws of Hong Kong with its principal place of business in Shatin, New Territories, Hong Kong. Exhibit 14 (Complaint ¶ 12, *Cree, Inc. v. MSi Lighting, Inc.*, No. 1:15-cv-00706 (M.D.N.C. Aug. 27, 2015), ECF No. 1).

19. Cree Hong Kong Limited is a wholly owned subsidiary of Cree, Inc.

20. On information and belief, Cree Hong Kong Limited manufactures LED lighting components, and sells such components to retailers and manufacturers throughout Asia. *Id.*; *see also* Exhibit 15 (*Company Overview of Cree Hong Kong Limited, available at* BLOOMBERG, https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=23063145 (last visited Mar. 11, 2019) ("Cree Hong Kong Limited operates as a LED manufacturer in China.")). Cree acquired COTCO Luminant Device Limited—now Cree Hong Kong Limited—in 2007 to provide "expanded packaging, research and development capabilities, a broader LED component

portfolio, a lower cost manufacturing facility and expanded . . . sales channels in China." Exhibit 16 (Cree, Inc., Annual Report (Form 10-K) (Aug. 18, 2010)); *see* Exhibit 17 (*Cree to Acquire COTCO Luminant Device Ltd.*, CREE.COM, *available at* http://investor.cree.com/news-releases/news-release-details/cree-acquire-cotco-luminant-device-ltd (last visited Mar. 11, 2019) ("COTCO is one of the leading LED manufacturers in Asia.")).

21. On information and belief, Cree Hong Kong Limited manufactures, sells for importation into the United States, imports into the United States, and/or sells after importation into the United States the Accused Products and/or knowingly induces such activity.

C. Cree Huizhou Solid State Lighting Company Limited

22. Cree Huizhou Solid State Lighting Company Limited is organized under the laws of the People's Republic of China with a principal place of business in Huizhou, Guangdong Province, China. Exhibit 13 (Cree, Inc., Annual Report (Form 10-K) (Aug. 20, 2018) at Exhibit 21.1, Significant Subsidiaries of the Registrant); Exhibit 18, *Company Overview of Cree Huizhou Solid State Lighting Company Limited*, BLOOMBERG, *available at* https://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapid=154010064 (last visited Mar. 11, 2019)).

23. Cree Huizhou Solid State Lighting Company Limited is a wholly owned subsidiary of Cree Hong Kong Limited.

24. In 2009, Cree, Inc. established Cree Huizhou Solid State Lighting Company Limited and signed an agreement with the city of Huizhou to open a manufacturing facility in Huizhou. Exhibit 19 (Tim Whitaker, *Cree Opens LED Chip Manufacturing Facility in Huizhou*, LEDS MAGAZINE (Dec. 13, 2010), *available at* https://www.ledsmagazine.com/articles/2010/12/cree-opens-led-chip-manufacturing-facility-in-huizhou.html.). The Huizhou, China facility tests, cuts, and classifies LED wafers prior to

packaging. *Id.* This facility was created to increase Cree's LED chip production capacity to satisfy increased global demand. *Id.*

25. On information and belief, Cree Huizhou Solid State Lighting Company manufactures, sells for importation into the United States, imports into the United States, and/or sells after importation into the United States the Accused Products and/or knowingly induces such activity.

IV. THE ACCUSED PRODUCTS-AT-ISSUE

26. Pursuant to 19 C.F.R. § 210.12(a)(12), the category of the Accused Products may be plainly described as LED packages, which are housings that include an LED chip and one or more phosphors, comprised of fluoride-based phosphors activated with manganese, and products containing the same, made by or for Respondents. Section VI, *infra*, details specific instances of the unlawful importation, sale for importation, and/or sale after importation of the Accused Products.

27. Exemplary Accused Products include, but are not limited to, Respondents' XLamp® eTone LED packages, including at least the products listed in Exhibit 20.

28. This identification of exemplary models and types of products is intended purely for illustration and is not intended to limit the scope of the investigation. Any remedy should extend to all present and future infringing products of each Respondent, including products made by or on behalf of any named Respondent for third parties and sold under third-party brand names, regardless of model number or type of product.

V. THE ASSERTED PATENTS

A. U.S. Patent No. 7,497,973

1. Identification of the Patent and Ownership by Current Lighting Solutions, LLC and General Electric Co.

29. The '973 Patent is entitled "Red Line Emitting Phosphor Materials for Use in LED Applications." It issued on March 3, 2009 from U.S. Application Serial No. 11/364,611 (the "'611 Application"), filed on February 28, 2006. The '611 Application is a continuation-in-part of U.S. Application Serial No. 11/285,442 (the "'442 Application"), filed on November 22, 2005. The '442 Application is a continuation-in-part of U.S. Application Serial No. 11/049,598 (the "'598 Application"), filed on February 2, 2005. The '611 Application identifies Emil Vergilov Radkov, Ljudmil Slavchev Grigorov, Anant Achyut Setlur, and Alok Mani Srivastava as inventors.

30. Current and GE each own an undivided one-half right, title and interest in and to the '973 Patent, and thus together jointly own by assignment the entire right, title, and interest in and to this patent. Exhibit 4 is a certified copy of an assignment of the patent application for the '973 Patent from the inventors to GELcore, LLC on February 27, 2006. Exhibit 3 is a certified copy of a change of name certificate from GELcore, LLC to Lumination, LLC dated January 26, 2007. Exhibit 5 is an assignment of the '973 Patent from Lumination, LLC to GE Lighting Solutions, LLC on July 29, 2010. Exhibit 6 is a certified copy of the assignment history of the '973 Patent that includes an assignment of an undivided one-half right, title and interest from GE Lighting Solutions, LLC to the General Electric Company on January 23, 2019. Exhibit 39 is a printout of a record from the Delaware Secretary of State, Division of Corporations showing the

change of name from GE Lighting Solutions, LLC to Current Lighting Solutions, LLC on April 1, 2019.[4]

31. The '973 Patent is subject to a license agreement defining certain rights as between Current, GE, and Consumer Lighting. *See* Exhibit 12C (Tripartite License Agreement). Current, GE, and Consumer Lighting each hold exclusive rights to the '973 Patent within a certain field or fields of use, and together they hold all substantial rights across all fields of use, including the right to sue and recover for all past, current, and future infringement.

32. The '973 Patent is valid, enforceable, and in full force and effect.

33. As required by Rule 210.12(c), Appendix A to this Complaint includes a certified copy and three additional copies of the prosecution history of the '973 Patent, and Appendix B to this Complaint includes four copies of each technical reference cited in the prosecution history of the '973 Patent.

34. The '973 Patent will expire on November 15, 2023.

2. Non-Technical Description of the Patented Invention

35. In non-technical terms, the '973 Patent discloses and claims phosphor compositions and lighting apparatuses that utilize particular phosphor compositions. A phosphor is a luminescent material that absorbs radiation energy in a portion of the electromagnetic spectrum and emits energy in another portion of the electromagnetic spectrum. For example, an LED lighting apparatus will typically contain a light emitting semiconductor diode chip that may emit light in the blue light spectrum. The lighting apparatus may contain one or more phosphors positioned such that the radiation emitted by the LED chip will excite the phosphor. When so excited, the phosphor will emit light in a different part of the spectrum—for example, red or

[4] A certified copy of the change of name record will be provided when it is available.

green. When a blue-emitting LED is combined with red and green-emitting phosphors in this way in a single package, the result is an LED that appears to the human eye to emit white light. The disclosed lighting apparatuses in the '973 Patent utilize certain complex fluoride phosphors activated with manganese ions (Mn^{4+}) for the red-emitting component that had not been previously used for LED lighting applications. The use of this phosphor resulted in lighting apparatuses for generating white light with high color rendering quality, *i.e.*, the ability to illuminate colors, and enhanced energy efficiency compared to use of prior art phosphors.

36. The phosphor materials utilized in the disclosed apparatuses comprise a complex fluoride phosphor-activated with Mn^{4+}. One such phosphor is $K_2[SiF_6]:Mn^{4+}$—known as Mn^{4+}-doped potassium fluorosilicate, or PFS. In some embodiments, the apparatuses also comprise cerium-doped yttrium aluminum garnet (YAG:Ce)—known as BSY.

3. Foreign Counterparts to the '973 Patent

37. The following foreign patents and patent applications correspond to the '973 Patent, *see also* Exhibit 8:

Patent Application/Patent No.	Country
EP1999230 (B1)	Europe[5]
JP5715327 (B2)	Japan
JP6002193 (B2)	Japan
JP6387041 (B2)	Japan

[5] EP1999230 (B1) designates the following countries:

Not lapsed: Germany, France, United Kingdom, and Netherlands.

Lapsed: Austria, Belgium, Bulgaria, Switzerland, Cyprus, Czech Republic, Denmark, Estonia, Spain, Finland, Greece, Hungary, Ireland, Iceland, Italy, Liechtenstein, Lithuania, Luxembourg, Latvia, Monaco, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, and Turkey.