IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

PICTIVA DISPLAYS INTERNATIONAL LTD. Plaintiff, v. **SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC.** Defendants.	)))))))))))))))	Civil Action No. 2:23-cv-00495-JRG JURY TRIAL DEMANDED

FIRST AMENDED COMPLAINT

1. Plaintiff Pictiva Displays International Ltd. ("Pictiva" or "Plaintiff"), by and through its undersigned counsel, brings this action against Samsung Electronics Co., Ltd. ("SEC") and Samsung Electronics America, Inc. ("SEA") (collectively, "Samsung" or "Defendants") to prevent the Defendants' continued use of Plaintiff's patents without authorization and to recover damages resulting from such unauthorized use.

I. THE PARTIES

2. Plaintiff Pictiva is a corporation organized and existing under the laws of Ireland, with its principal place of business at The Glasshouses GH2, 92 Georges Street Lower, Dun Laoghaire, Dublin, Ireland A96 VR66. It operated under the name of Dolya Holdco 5 Limited until July 17, 2020.

3. Pictiva is the assignee of all right, title, and interest in U.S. Patent Nos. 6,949,389 (the "'389 Patent," Ex. 1); 8,314,547 (the "'547 Patent," Ex. 2); 8,558,223 (the "'223 Patent," Ex. 3); 8,723,164 (the "'164 Patent," Ex. 4); 9,257,492 (the "'492 Patent," Ex. 5), and 11,828,425 (the "'425 Patent," Ex. 6) (collectively, the "Patents-in-Suit").

4. On information and belief, Defendant SEC is a corporation organized and existing under the laws of the Republic of Korea, with its principal place of business at 129, Samsung-ro, Yeongtong-gu, Suwon, Gyeonggi-do, 16677, Republic of Korea. On information and belief, SEC is the worldwide parent corporation for SEA. On information and belief, SEC designs, manufactures, and provides to the United States a range of digital consumer electronics, including devices containing organic light-emitting diode ("OLED") display panels, such as smartphones, tablets, computers, and televisions. On information and belief, SEC is also involved in the design, manufacture, and provision of products sold by SEA.

5. On information and belief, Defendant SEA is a corporation organized and existing under the laws of the State of New York. On information and belief, SEA is a wholly owned subsidiary of SEC. On information and belief, SEA, collectively with SEC, designs, manufactures, uses, offers for sale, sells, and/or imports into the United States a range of digital consumer electronics, including devices containing OLED display panels, such as smartphones, tablets, computers, and televisions. Defendant SEA maintains offices and facilities at 6625 Excellence Way, Plano, Texas 75023. SEA may be served with process through its registered agent for service in Texas: C T Corporation System, located at 1999 Bryan Street, Suite 900, Dallas, Texas 75201

6. Defendants operate under and identify with the trade name "Samsung." On information and belief, each of the Defendants directly or indirectly imports, develops, designs, manufactures, uses, distributes, markets, offers to sell, and/or sells products and services in the

United Sates, including in this district, and otherwise purposefully directs activities to the same. On information and belief, the Defendants have been and are acting in concert and are otherwise liable jointly, severally, or in the alternative for a right to relief with respect to or arising out of the same transaction, occurrence, or series of transactions or occurrences related to the making, using, importing into the United States, offering for sale or selling of at least one infringing product.

II. FACTUAL ALLEGATIONS

The Patents-in-Suit

7. The Patents-in-Suit relate to, among other things, novel and fundamental aspects of OLED display technologies. OLED is the chosen display technology in a significant percentage of smartphones, televisions, wearables, computers and other devices; and it provides higher resolutions, greater brightness, thinner panels, and higher power efficiency than the prior-art technologies.

8. The patented inventions resulted from years of research and development by OSRAM, including OSRAM Opto Semiconductors GmbH, a technology pioneer in the OLED field. OSRAM "embark[ed] on large scale research in the early 1990s, establishing state-of-the-art OLED design and manufacturing operations."[1] OSRAM's inventive efforts led to commercial success with OSRAM manufacturing and selling OLED display modules under the Pictiva brand name in the early 2000s.[2]

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[1] https://www.pictivadisplaysinternational.ie/ (last visited January 26, 2024); *see also* https://ams-osram.com/about-us/history ("1997: First patents for OLED technology"; "2005: First commercial luminaire with OLED modules by OSRAM") (last visited January 26, 2024).

[2] *E.g.*, Ron Mertens, *OSRAM Expands Display Product Line with New OLED "Pictiva,"* OLED-INFO (July 15, 2004), https://www.oled-info.com/oled_display_modules/osram_expands_display_product_line_with_new_oled_pictiva (reporting OARAM Opto Semiconductors' announcement of a new Pictiva OLED display).

9. OSRAM's innovations in optical solutions have resulted in hundreds of patents covering OLED technologies.[3] Today, Plaintiff Pictiva is responsible for protecting and licensing OSRAM's seminal innovations in the OLED display field.[4]

10. The '389 Patent is generally directed to novel methods for encapsulating a plurality of devices fabricated upon a substrate, which is beneficial for OLED devices. Ex. 1, at 2:42-43. As described in the '389 Patent, "[e]ncapsulation is a way to protect the OLED device from the damaging environmental effects—primarily from oxygen and moisture." *Id.* at 1:8-9. By way of example, the '389 Patent recites a novel method of encapsulating a plurality of devices fabricated upon a substrate that includes the steps of "fabricating a plurality of devices on a substrate," "selectively depositing at least one planarization layer upon said devices," and "selectively depositing at least one barrier layer over said planarization layer." *Id.* at 10:16-11:5 (claim 34). As the '389 Patent notes, the claimed method provides "cost reduction and improved reliability," as well as allowing the package to "be thinner and/or lighter and/or mechanically more flexible" as compared to the prior art methods for encapsulation. *Id.* at 1:48-52.

11. The '547 Patent relates to an optoelectronic device that emits electromagnetic radiation during operation and that includes a structured layer. By way of example, the '547 Patent recites a novel optoelectronic device that includes "a structured layer," which in turn includes "first and second regions" and is disposed "in the beam path of [an] electromagnetic radiation emitted by [an] organic layer sequence." Ex. 2, at 14:55-62. The first and second regions "are arranged

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[3] Key Patent Innovations, *Key Patent Innovations' Subsidiary Pictiva Display International Acquires Portfolio of OLED Patents from OSRAM*, CISION (Oct. 13, 2020), https://www.newswire.ca/news-releases/key-patent-innovations-subsidiary-pictiva-display-international-acquires-portfolio-of-oled-patents-from-osram-836552575.html.

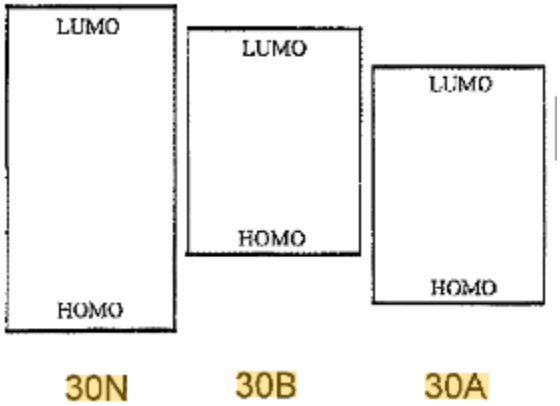
[4] https://www.pictivadisplaysinternational.ie/ ("Pictiva is focused on licensing these pioneering inventions to established players and new entrants in the OLED display market.") (last visited January 26, 2024).

laterally in a beam path of the optoelectronic device," wherein the first regions "each include a wavelength conversion layer" for converting light in the first wavelength spectrum to that "having a second wavelength spectrum," and the second regions "each include a filter layer," transparent to light in the first wavelength spectrum. *Id.* at 14:63-15:10.

12. The '223 Patent is generally directed to a novel "organic electronic component," which comprises "an electron-conducting layer." Ex. 3, at Abstract. By way of example, the '223 Patent includes an "organic electronic component," which comprises "a substrate, a first electrode, a second electrode, [and] an electron-conducting layer which is arranged in such a way that it is electrically conductively connected to at least one of the electrode." *Id.* at 19:12-17 (claim 1). Moreover, the electron-conducting layer is "obtained by joint vaporization of a metal complex" with "an organic compound" that "comprises a heteroaromatic compound which is conjugated with an aromatic compound via a C-C bond." *Id.* at 19:18-20. According to the '223 Patent, the joint vaporization process allows the metal complex and organic compound to "interact with one another in the gas phase or when they meet one another on the substrate surface," which "causes the compounds to be mutually coordinated." *Id.* at 1:60-64. The "coordination of the organic compound on the metal complexes," in turn, will increase the "free" electrons, thereby improving "the electron conductivity in the component." *Id.* at 2:6-14. The "joint vaporization" creates "a short-range order," but the organic compound—in particular, the C-C bond—causes the entire layer to be amorphous with no long-range order. *Id.* at 1:64-2:6. This arrangement improves reliability as well as homogeneity in emission.

13. The '164 Patent generally pertains to electronic devices having organic functional layers. Ex. 4, at 1:33-36. By way of example, the '164 Patent provides a novel electronic device comprising "a substrate," "a first electrode," "a second electrode," and "at least one organic

functional layer" located between the two electrodes. *Id.* at 10:41-47 (claim 16). The organic functional layer further comprises "at least a first matrix material, a second matrix material, and a third matrix material." *Id.* at 10:47-49. Each matrix material has "a Lowest Unoccupied Molecular Orbital (LUMO)" and "Highest Occupied Molecular Orbital (HOMO)," wherein the third matrix material has the lowest LUMO among the three matrix materials, and the second matrix material has the highest HOMO among the three matrix materials. *Id.* at 10:50-57. The first matrix material also has a lower charge carrier mobility than the charge carrier mobilities of the second and third matrix materials. As the '164 Patent describes, this is advantageous because it can, *inter alia*, "provide an electronic device with an improved charge carrier balance in the organic layers and thus an increased efficiency." *Id.* at 1:33-36. An example of such matrices materials are shown below:



14. The '492 Patent is generally directed to a novel electronic component and method for the production thereof. Ex. 5, at 1:17-19. By way of example, the '492 Patent recites an electronic component comprising first and second electrically conductive layers on a substrate, "a first trench in the first and second electrically conductive layers," which "separates a first contact region from a second contact region," "a dielectric" "applied in a structured fashion on the second electrically conductive layer in the first contact region and at least partly on the substrate in the

first trench such that said dielectric electrically insulates the first contact region from the second contact region," and "an electrically conductive electrode layer" applied "on the dielectric above the first contact region and at least partly on the second contact region." *Id.* at 22:27-42 (claim 16).

15. The '425 Patent relates to a novel "device comprising an organic light-emitting diode." Ex. 6, at Abstract, 1:21-22. By way of example, the '425 Patent describes "an organic light-emitting diode" having "an organic layer sequence," "a radiation exit area," "an encapsulation," and at least one "carrier." *Id.* at 1:28-31, 6:6-8. In certain embodiments, the organic layer sequence includes "at least one radiation-emitting region" comprising "at least one emission layer," which "generates electromagnetic radiation in the spectral range from infrared radiation to UV radiation during operation," and "an electron transport layer"—which may be n-doped—as a "charge carrier transport layer[]." *Id.* at 1:31-34, 2:13-15, 3:28-29, claim 1.

Samsung's Devices and Infringement

16. On information and belief, Samsung makes, uses, sells, offers for sale and/or imports infringing products in the United States, including, but not limited to, Samsung smartphones, computers, tablets, personal wear products, televisions, and other consumer electronic products that incorporate infringing OLED displays (the "Accused Products"). Examples of the Accused Products include, but are not limited to, certain Galaxy smartphones, computers, tablets, and personal wear products, as well as certain televisions.

17. On information and belief, starting from at least 2008, Samsung began to incorporate OLED displays in its devices. On information and belief, the global OLED market is led by Samsung, with Samsung having over a 90% market share on smartphone OLED displays in 2020. This is substantial because, on information and belief, over 40% of the smartphones sold

in 2022 incorporate OLED displays. On information and belief, Samsung also markets TVs with OLED screens, including ones powered by quantum dot technology.

18. On its website, Samsung discusses the importance of OLED displays stating that: "OLED is excellent in terms of image quality, thickness, and power consumption as each pixel directly emits light, and its bendable and foldable properties allow it to be utilized in a variety of applications"; OLED "boasts excellent color reproducibility" and "brings a variety of colors to life"; OLED's "high brightness and low reflectance . . . allows you to get clear image quality even under strong sunlight"; OLED's "contrast ratio is close to infinity," making it "the best display for realizing High dynamic range (HDR) because it can express detailed, deeper and more three-dimensional images"; and "OLED realises fast response speed with fast electron mobility . . . so you can see fast and natural movements without delay."[5] Samsung incorporates AMOLED (active-matrix organic light-emitting diode) and Super AMOLED display technologies in its mobile devices and televisions.[6] Super AMOLED "integrates touch-sensors and the actual screen in a single layer." *Id.*

19. On its website, Samsung also notes the improved experience brought by its OLED technology to TV viewers, stating, for example, "Bring the movie theater experience home with Samsung OLED. Combining 8.3 million self-lit pixels with Quantum Dots (QD) lets you discover the ultimate entertainment experience. With Samsung OLED Technology, your favorite content comes to life with the deepest blacks and a billion colors that burst from the screen."[7]

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[5] SAMSUNG DISPLAY, *OLED Display*, https://www.samsungdisplay.com/eng/tech/oled-display.jsp (last visited May 26, 2023).

[6] https://www.samsung.com/in/support/mobile-devices/what-is-the-difference-between-amoled-and-super-amoled/ (last visited February 28, 2024).

[7] https://www.samsung.com/us/tvs/oled-tvs/ (last visited June 28, 2023).

Samsung's Knowledge of the Patents-in-Suit and Infringement

20. SEC, through its subsidiary Samsung Display Co., Ltd. ("SDC"), has had actual knowledge of the '547 patent since no later than September 21, 2016, at which time it submitted an Information Disclosure Statement to the USPTO citing the '547 patent pursuant to 37 C.F.R. §§ 1.56, 1.97, 1.98 in connection with its own pending patent application related to OLED technology, which subsequently issued as U.S. Patent No. 9,267,651.

21. Samsung was also aware of the Pictiva patents, and Pictiva's assertion that Samsung was infringing those patents as a result of licensing discussions. For example, on or around September 25, 2020, Pictiva notified SEC—through its subsidiary Samsung Display Co., Ltd. ("SDC")—that Samsung's products incorporating OLED displays, including but not limited to the displays found in the Samsung Galaxy S8, S9, and S20, infringe one or more of the claims of certain Pictiva patents. Pictiva further informed Samsung (through its subsidiary SDC) that Pictiva believed that Samsung "requires a license from Pictiva" to continue making, using, selling, or offering for sale those infringing products.

22. On or around October 7, 2020, Pictiva and SDC entered into a Mutual Non-Disclosure Agreement "[f]or the purpose of evaluating a possible license or other transaction between the Parties in connection with a portfolio of patents owned by Pictiva relating to OLED display technology and facilitating discussions that may follow or result as a consequence of such evaluation." In or around November, 2020, Pictiva and SDC began to engage in a series of negotiations to discuss the patents and license terms. For example, on or around December 16, 2020, Pictiva sent, among other things, a claim chart concerning the '389 Patent to SDC. Moreover, in their meetings, Pictiva presented SDC with claim charts to one or more claims of at least one of the Patents-in-Suit. For example, no later than June 2021, Pictiva provided SDC with a claim chart mapping claims 34 and 35 of the '389 Patent to the Samsung Galaxy S20. And no

later than June 2021, Pictiva provided SDC with exemplary lists of patents—including the ’223 and ’164 Patents—that Pictiva believed were infringed by SDC smartphone display panels.

23. Further, on or around August 17, 2021, Pictiva reiterated to SEC directly that SEC required a license from Pictiva because SEC was making, using, selling, or offering for sale products that infringe one or more of Pictiva’s patents. Pictiva provided SEC with an exemplary list of patents—including the ’389, ’223, and ’164 Patents—that Pictiva believed SEC was infringing through the making, using, selling or offering for sale of SEC’s products incorporating OLED displays, including but not limited to the displays found in the Samsung Galaxy S8, S9, and S20 smartphones and Galaxy Book Pro laptops.

24. After several discussions, Pictiva and SDC failed to reach a meeting of the minds. As a result, Pictiva is forced to bring this suit to vindicate its rights.

25. As another example, Samsung has had actual knowledge of the ’389 and ’547 patents and Pictiva’s allegations of infringement since at least as of the service of the original Complaint in this action. Moreover, Samsung has had actual knowledge of the ’223, ’164, ’492, and ’425 patents and Pictiva’s allegations of infringement since at least as of the service of this First Amended Complaint in this action.

26. Despite having received notice that it was and is infringing Pictiva’s patents, Samsung continues to make, use, sell, offer for sale, and/or import into the United States the Accused Products, including Accused Products that are made in accordance with one or more of the asserted patents. The Accused Products that are made or have components that are made in accordance with one or more of the asserted patents and that are subsequently imported into the United States or offered for sale, sold or used in the United States are not materially changed by subsequent processes and do not become a trivial and nonessential component of another product.

Samsung's making, using, selling, offering to sell, and/or importing of the Accused Products into the United States constitute direct infringement under 35 U.S.C. §§ 271(a) and/or 271(g).

27. Despite having received notice that it was and is infringing Pictiva's patents, Samsung remained willfully blind to the risk of infringement by its customers, partners, dealers, representatives, and agents, despite believing there to be a high probability of infringement due to its instructions and inducement, in violation of 35 U.S.C. § 271(b).

28. After having received notice that it was and is infringing Pictiva's patents, Samsung continued to advertise the infringing features, distribute the Accused Products, offer technical assistance, provide literature featuring OLED displays to customers, dealers and partners, and advise them to import, offer to sell, sell, or use the Accused Products in a manner that directly infringed the Patents-in-Suit, in violation of 35 U.S.C. § 271(b).

III. JURISDICTION AND VENUE

29. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a), because this action arises under the patent laws of the United States of America, 35 U.S.C. § 1, *et seq.*, including 35 U.S.C. § 271.

30. Each Defendant is subject to this Court's personal jurisdiction consistent with the principles of due process and/or the Texas Long Arm Statute. Tex. Civ. Prac. & Rem. Code §§ 17.041, *et seq.*

31. This Court has personal jurisdiction over Samsung because each Defendant has sufficient minimum contacts and/or has engaged in substantial, continuous, and systematic activities with the State of Texas and with the Eastern District of Texas. For example, Defendant SEA has a regular and established place of business in the State of Texas and in this judicial district, and maintains facilities and employees within Texas and within this judicial district. Personal jurisdiction also exists over Samsung because each Defendant, directly or through

subsidiaries, makes, uses, sells, offers for sale, imports, advertises, makes available, and/or markets products within the State of Texas and the Eastern District of Texas that infringe one or more claims of the Patents-in-Suit, and has committed acts of infringement and/or contributed to or induced acts of infringement by others in this judicial district and elsewhere in Texas. Further, Defendants have placed or contributed to placing infringing products into the stream of commerce knowing or understanding that such products would be sold and used in the United States, including in this judicial district. Additionally, Defendant SEA is registered to do business in Texas and maintains an agent authorized to receive service of process within Texas. Samsung further authorizes sales of and services for the Accused Products in this judicial district. For example, on information and belief, Samsung authorizes sales at Best Buy, Costco, Walmart, and others located in this judicial district. Samsung further maintains authorized service centers in this judicial district, including at, for example, 3580 Preston Rd #100, Frisco, Texas 75034.

32. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391(b)-(d) and/or 1400(b). For example, SEA has a regular and established place of business in this district and has committed acts of infringement in this district. And SEC is a foreign defendant for whom venue is proper in any district in which it is subject to personal jurisdiction. As noted above, SEC has regularly conducted business in this district and is subject to personal jurisdiction in this district; and certain acts complained of herein occurred in this district.

IV. FIRST CLAIM FOR RELIEF – INFRINGEMENT OF THE ’389 PATENT

33. Pictiva re-alleges and incorporates by reference the allegations of the preceding paragraphs of this Complaint as if fully set forth herein.

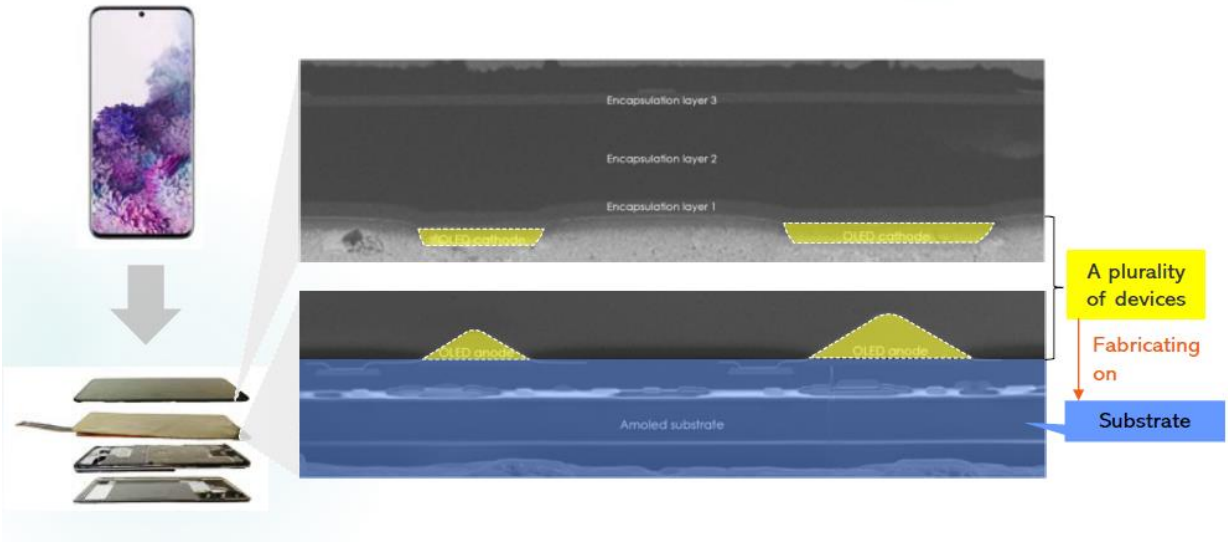
34. The ’389 Patent is entitled “Encapsulation for Organic Light Emitting Diodes Devices.” The ’389 Patent was filed as Application No. 10/137,163 on May 2, 2002, and issued on September 27, 2005. A true and correct copy of the ’389 Patent is attached as Exhibit 1.

35. The ’389 Patent names Karl Pichler and Kyle D. Frischknecht as co-inventors.

36. Pictiva owns by assignment the entire right, title, and interest in and to the ’389 Patent, including the exclusive right to seek damages for past infringement thereof.

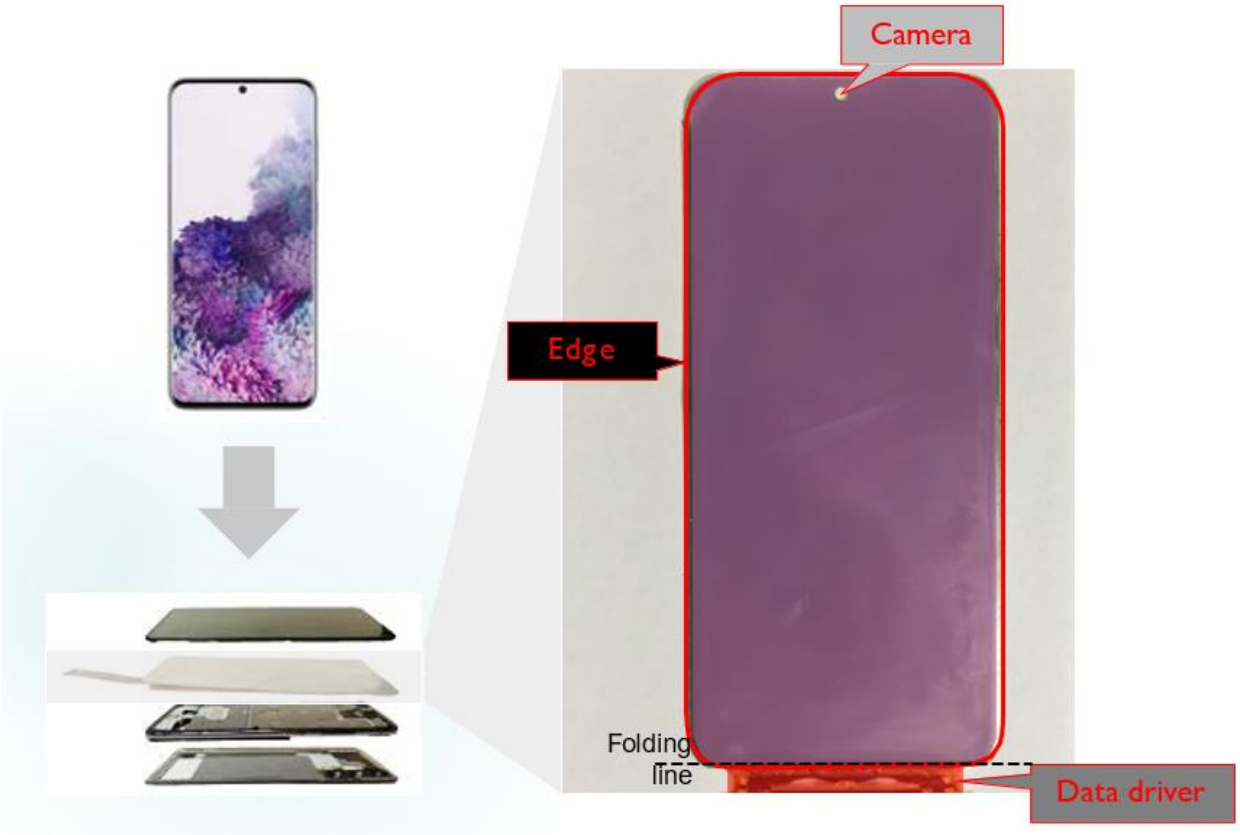
37. Pictiva is informed and believes, and on this basis alleges, that Samsung, agents of Samsung, and/or third parties acting under Samsung’s direction and control, have committed acts of direct infringement under 35 U.S.C. §§ 271(a) and/or 271(g) of the ’389 Patent literally and/or under the doctrine of equivalents by making, using, selling, offering to sell, and/or importing within this district and elsewhere in the United States, without authority, products that are made or include components that are made in accordance with one or more claims of the ’389 Patent (the “’389 Accused Products”), including, for example, various Galaxy smartphones, computers, tablets, personal wear products, and/or other consumer electronic products, and, on information and belief, those products (or components) are not materially changed by subsequent process and have not become trivial and nonessential components of another product.

38. On information and belief, the ’389 Accused Products have infringed at least one claim of the ’389 Patent. By way of example, Samsung’s manufacturing of the Galaxy S20 smartphone included all recited steps of claim 34, including “fabricating a plurality of devices on a substrate,” with the plurality of devices being, e.g., OLED devices as in an example shown below;



"selectively depositing at least one planarization layer upon said devices" and "selectively depositing at least one barrier layer over said planarization layer," as in an example shown below;

and wherein the planarization and barrier layers are selectively deposited (as shown in purple in the example below) without covering the edge, data driver, or camera hole (as shown in red in the example below).



39. Pictiva is also informed and believes, and on this basis alleges, that Samsung has induced infringement of the ’389 Patent, in violation of 35 U.S.C. § 271(b), by intentionally aiding and encouraging third parties (including Samsung’s vendors, customers, and partners) to make, use, sell, or offer for sale in the United States and/or import into the United States the ’389 Accused Products made in accordance with one or more claims of the ‘389 patent, having known that the acts it was causing would infringe or have a high probability of infringing the ’389 Patent under 35 U.S.C. §§ 271(a) and/or 271(g) and with a specific intent that those performing the acts infringe the ’389 Patent.

40. As a result of Samsung’s infringement of the ’389 Patent, Pictiva has been damaged. Pictiva is entitled to recover for damages sustained as a result of Samsung’s wrongful acts in an amount yet to be determined.

41. Samsung has had actual knowledge of its infringement of the ’389 Patent since no later than June 2021. Pictiva is further informed, and on this basis alleges, that Samsung’s infringement of the ’389 Patent was deliberate and willful, and, therefore, this is an exceptional case warranting an award of enhanced damages for up to three times the actual damages awarded and attorney’s fees to Pictiva pursuant to 35 U.S.C. §§ 284-285.

V. SECOND CLAIM FOR RELIEF – INFRINGEMENT OF THE ’547 PATENT

42. Pictiva re-alleges and incorporates by reference the allegations of the preceding paragraphs of this Complaint as if fully set forth herein.

43. The ’547 Patent is entitled “Opto-Electronic Component.” The ’547 Patent was filed as Application No. 12/679,138 on March 19, 2010, issued as a patent on November 20, 2012, and claims priority to, among others, PCT Application No. PCT/DE2008/001302, filed on August 4, 2008, which in turn claims priority to German Application No. 102007044597, filed on September 19, 2007. A true and correct copy of the ’547 Patent is attached as Exhibit 2.

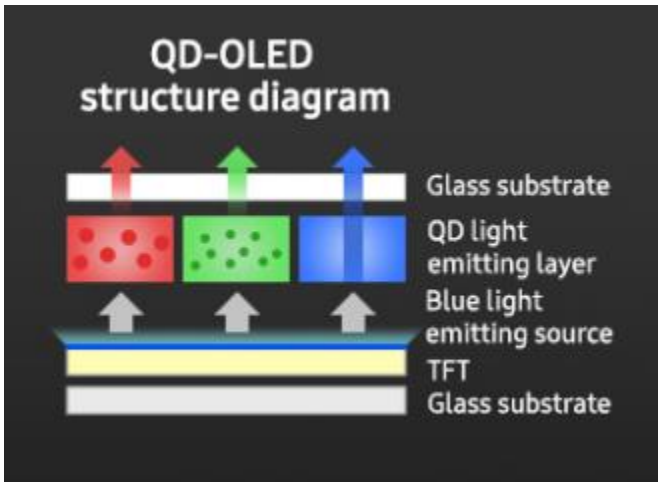
44. The ’547 Patent names Markus Klein, Norwin Von Malm, and Benjamin Claus Krummacher as co-inventors.

45. The ’547 Patent has been in full force and effect since its issuance. Pictiva owns by assignment the entire right, title, and interest in and to the ’547 Patent, including the right to seek damages for past, current, and future infringement thereof.

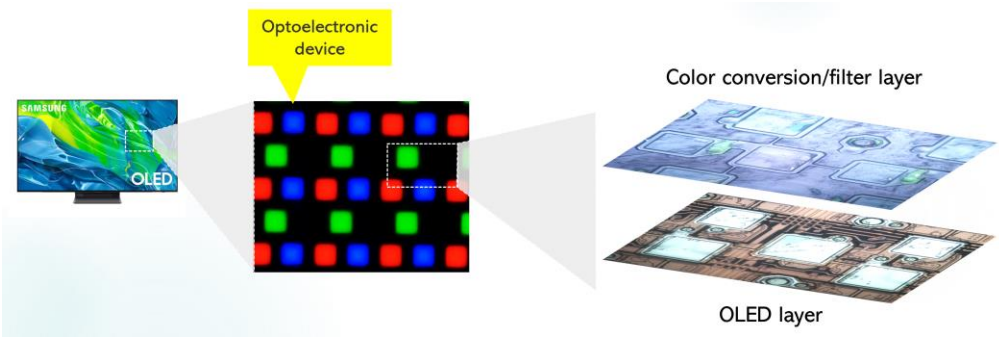
46. Pictiva is informed and believes, and on this basis alleges, that Samsung, agents of Samsung, and/or third parties acting under Samsung’s direction and control, have committed and continue to commit acts of direct infringement of the ’547 Patent literally and/or under the doctrine of equivalents by, among other things, making, using, selling, offering to sell, and/or importing within this district and elsewhere in the United States, without authority, products that infringe the

’547 Patent (the “’547 Accused Products”), including, for example, various S95 televisions and other infringing consumer electronic products that include similar structure and functionality.

47. On information and belief, the ’547 Accused Products infringe at least one claim of the ’547 Patent. By way of example, the S95B TV uses an OLED panel (i.e., “an optoelectronic device”) that includes all of the recited elements of claim 1, including “an organic layer sequence which emits an electromagnetic radiation having a first wavelength spectrum during operation” (e.g., a spectrum corresponding to blue light) and “a structured layer disposed downstream of the organic layer sequence in a beam path of the electromagnetic radiation . . . and including first and second regions” that are “arranged laterally in [the] beam path” as shown in an example below,[8] where the first regions correspond to for example the green (or red) subpixel region and the second regions correspond to at least the blue subpixel regions;

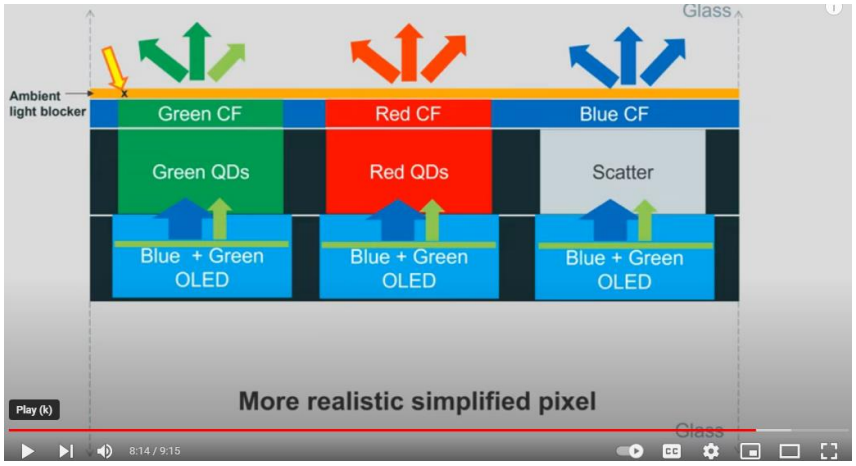


[8] https://www.samsungdisplay.com/eng/tech/quantum-dot.jsp#:~:text=QD%2DOLED%2C%20a%20self%2D,emitted%20from%20the%20light%20source.



the "first regions each includ[ing] a wavelength conversion layer configured to convert at least partially electromagnetic radiation having a first wavelength spectrum into an electromagnetic radiation having a second wavelength spectrum" (e.g., converting from a spectrum corresponding to blue light to a spectrum corresponding to green light) as shown in an example below; and the "second regions each includ[ing] a filter layer which is at least partially opaque to an electromagnetic radiation having a third wavelength spectrum which corresponds to at least one part of the second wavelength spectrum" and that "is transparent to the electromagnetic radiation having the first wavelength spectrum" (e.g., a filter layer transparent to wavelength spectrums corresponding to blue light but opaque to wavelength spectrums corresponding to at least red or green light) as shown in an example below.[9]

[9] https://www.youtube.com/watch?v=o-LbIBRuyog.



48. Pictiva is informed and believes, and on this basis alleges, that Samsung has been and currently is inducing infringement of the ’547 Patent, in violation of 35 U.S.C. § 271(b), by intentionally aiding and encouraging third parties (including Samsung’s vendors, customers, and partners) to make, use, sell, or offer for sale in the United States and/or import into the United States the ’547 Accused Products, having known that the acts it was causing would infringe or have a high probability of infringing the ’547 Patent under 35 U.S.C. § 271(a) and with a specific intent that those performing the acts infringe the ’547 Patent.

49. As a result of Samsung’s infringement of the ’547 Patent, Pictiva has been damaged and will continue to be damaged. Pictiva is entitled to recover for damages sustained as a result of Samsung’s wrongful acts in an amount yet to be determined.

50. Samsung has had actual knowledge of the ’547 Patent since no later than September 2016. Pictiva is further informed, and on this basis alleges, that Samsung’s infringement of the ’547 Patent has been and continues to be deliberate and willful, and, therefore, this is an exceptional case warranting an award of enhanced damages for up to three times the actual damages awarded and attorney’s fees to Pictiva pursuant to 35 U.S.C. §§ 284-285.

51. In addition, Samsung’s infringing acts and practices have caused and are causing immediate and irreparable harm to Pictiva.

VI. THIRD CLAIM FOR RELIEF – INFRINGEMENT OF THE ’223 PATENT

52. Pictiva re-alleges and incorporates by reference the allegations of the preceding paragraphs of this Complaint as if fully set forth herein.

53. The ’223 Patent is entitled “Organic Electronic Component and Method for the Production Thereof.” The ’223 Patent was filed as Application No. 13/121,090 on March 25, 2011, issued as a patent on October 15, 2013, and claims priority to, among others, PCT Application No. PCT/DE2009/001359, filed on September 25, 2009, which in turn claims priority to German Application Nos. 102008049286, filed on September 26, 2008, and 102008056391, filed on November 7, 2008. A true and correct copy of the ’223 Patent is attached as Exhibit 3.

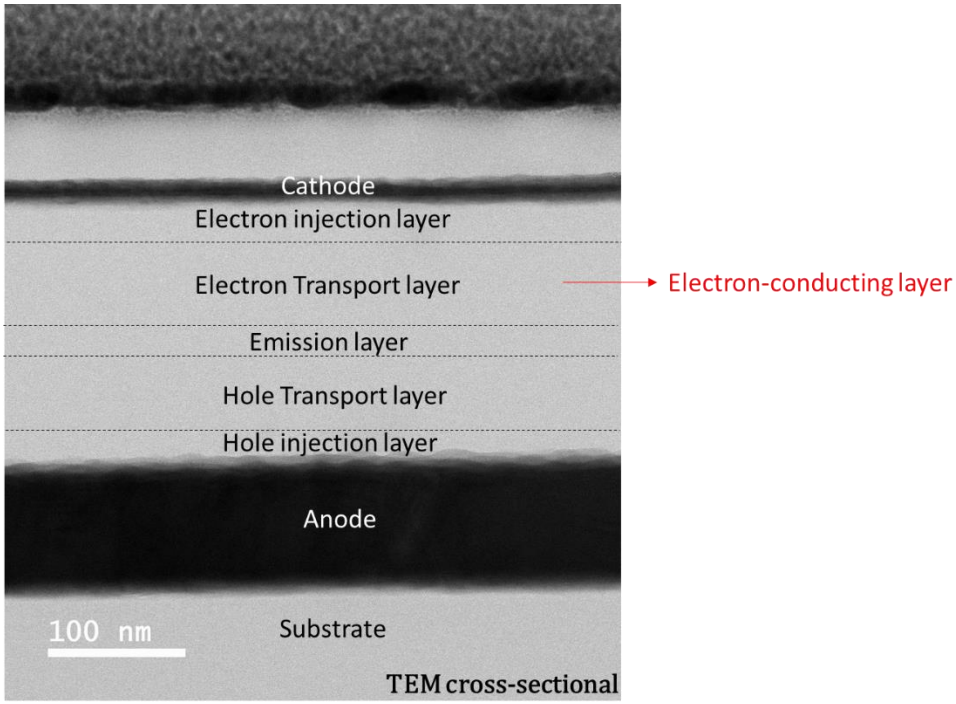
54. The ’223 Patent names Günter Schmid, Ralf Krause, Andreas Kanitz, Jürgen Adler, Stefan Seidel, and Arvid Hunze as co-inventors.

55. The ’223 Patent has been in full force and effect since its issuance. Pictiva owns by assignment the entire right, title, and interest in and to the ’223 Patent, including the right to seek damages for past, current, and future infringement thereof.

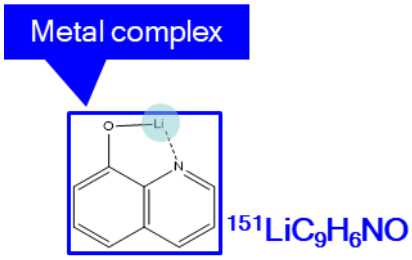
56. Pictiva is informed and believes, and on this basis alleges, that Samsung, agents of Samsung, and/or third parties acting under Samsung’s direction and control, have committed and continue to commit acts of direct infringement of the ’223 Patent literally and/or under the doctrine of equivalents by, among other things, making, using, selling, offering to sell, and/or importing within this district and elsewhere in the United States, without authority, products that infringe the ’223 Patent (the “’223 Accused Products”), including, for example, various Galaxy smartphones, computers, tablets, personal wear products, and/or other consumer electronic products.

57. On information and belief, the ’223 Accused Products infringe at least one claim of the ’223 Patent. By way of example, Samsung’s Galaxy S20 OLED display includes all of the recited elements of claim 1, including “a substrate,” “a first electrode” (e.g., an anode) and “a

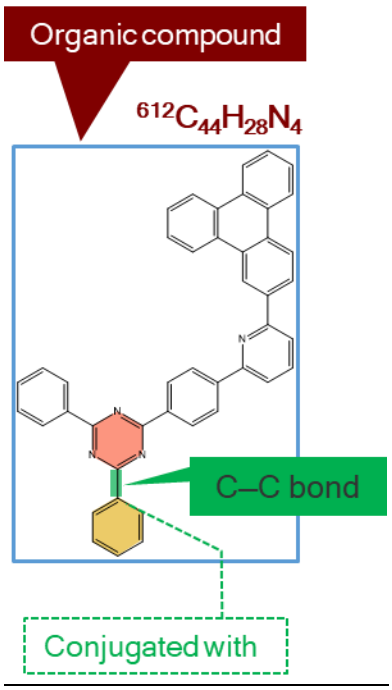
second electrode" (e.g., a cathode) on the substrate, and "an electron-conducting layer" (e.g., an electron transport layer) on the substrate "in such a way that it is electrically conductive connected to" the cathode, as shown in an example below.



Moreover, on information and belief, "the electron-conducting layer is obtained by joint vaporization of a metal complex, which comprises a central metal atom," e.g., a lithium metal complex, such as the Liq compound shown below,



"with an organic compound," which "comprises a heteroaromatic compound which is conjugated with an aromatic compound via a C-C bond." An example is shown below.



58. As another example, the Accused Products are made or include components that are made in accordance with one or more method claims of the '223 Patent. For example, the process includes providing a substrate, applying a first and second electrode, depositing an electron-conducting layer (*e.g.*, an electron transport layer) on the substrate, wherein the electron conducting layer is deposited by simultaneous vaporization of a metal complex such as Liq with an organic compound that comprises a heteroaromatic compound which is conjugated with an aromatic compound via a C-C bond as demonstrated above. The products or components made in accordance with the claimed methods are not materially changed by subsequent processes and do not become a trivial and non-essential component of another product. Samsung imports the Accused Products made using the claimed methods into the United States without authorization, and/or sells, offers for sale or uses such Accused Products without authorization in the United States, in violation of 35 U.S.C. § 271(g).

59. Pictiva is informed and believes, and on this basis alleges, that Samsung has been and currently is inducing infringement of the '223 Patent, in violation of 35 U.S.C. § 271(b), by

intentionally aiding and encouraging third parties (including Samsung's vendors, customers, and partners) to make, use, sell, or offer for sale in the United States and/or import into the United States the Accused Products, having known that the acts it was causing would infringe or have a high probability of infringing the '223 Patent under 35 U.S.C. § 271(a) and 271(g) and with a specific intent that those performing the acts infringe the '223 Patent.

60. As a result of Samsung's infringement of the '223 Patent, Pictiva has been damaged and will continue to be damaged. Pictiva is entitled to recover for damages sustained as a result of Samsung's wrongful acts in an amount yet to be determined.

61. In addition, Samsung's infringing acts and practices have caused and are causing immediate and irreparable harm to Pictiva.

62. Samsung has had actual knowledge of its infringement of the '223 Patent since no later than August 2021. Pictiva is further informed, and on this basis alleges, that Samsung's infringement of the '223 Patent has been and continues to be deliberate and willful, and, therefore, this is an exceptional case warranting an award of enhanced damages for up to three times the actual damages awarded and attorney's fees to Pictiva pursuant to 35 U.S.C. §§ 284-285.

VII. FOURTH CLAIM FOR RELIEF – INFRINGEMENT OF THE '164 PATENT

63. Pictiva re-alleges and incorporates by reference the allegations of the preceding paragraphs of this Complaint as if fully set forth herein.

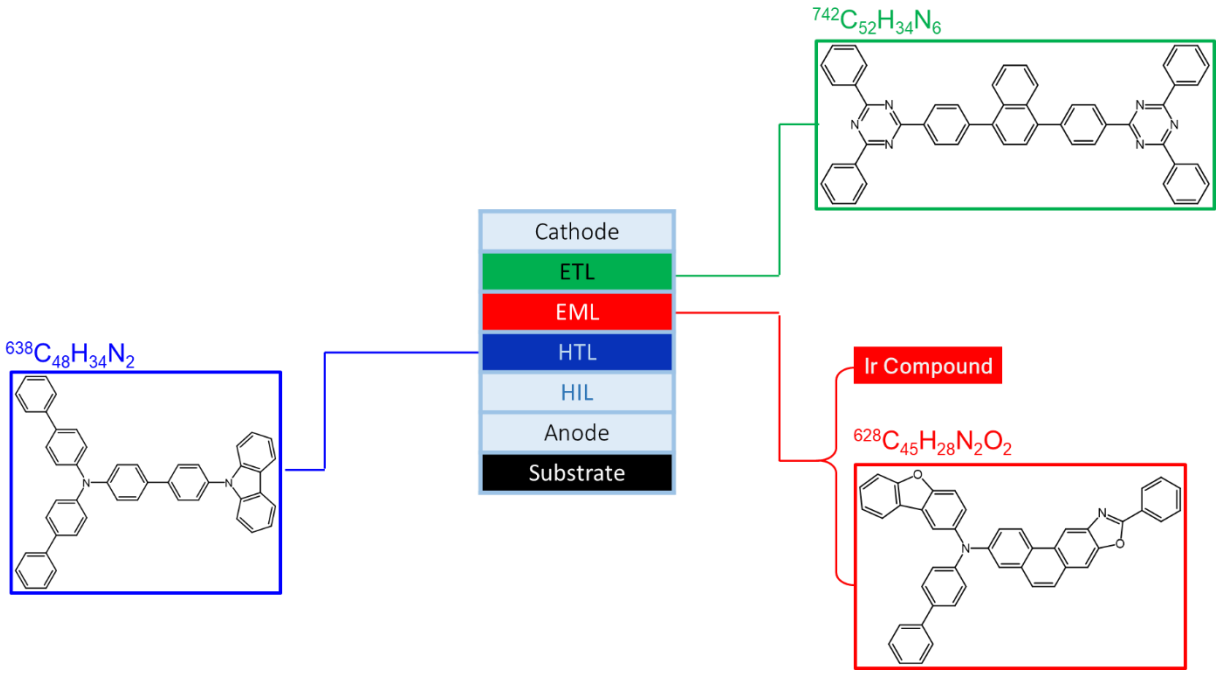
64. The '164 Patent is entitled "Electronic Device." The '164 Patent was filed as Application No. 12/995,457 on November 30, 2010, issued as a patent on May 13, 2014, and claims priority to, among others, PCT Application No. PCT/DE2009/000701, filed on May 18, 2009, which in turn claims priority to German Application Nos. 102008025920, filed on May 30, 2008, and 102008039361, filed on August 22, 2008. A true and correct copy of the '164 Patent is attached as Exhibit 4.

65. The ’164 Patent names Guenter Schmid, Ralf Krause, Stefan Seidel, Oliver Weiss, Christoph Gaerditz, Riikka Suhonen, Ulrich Niedermeier, and Fryderyk Kozlowski as co-inventors.

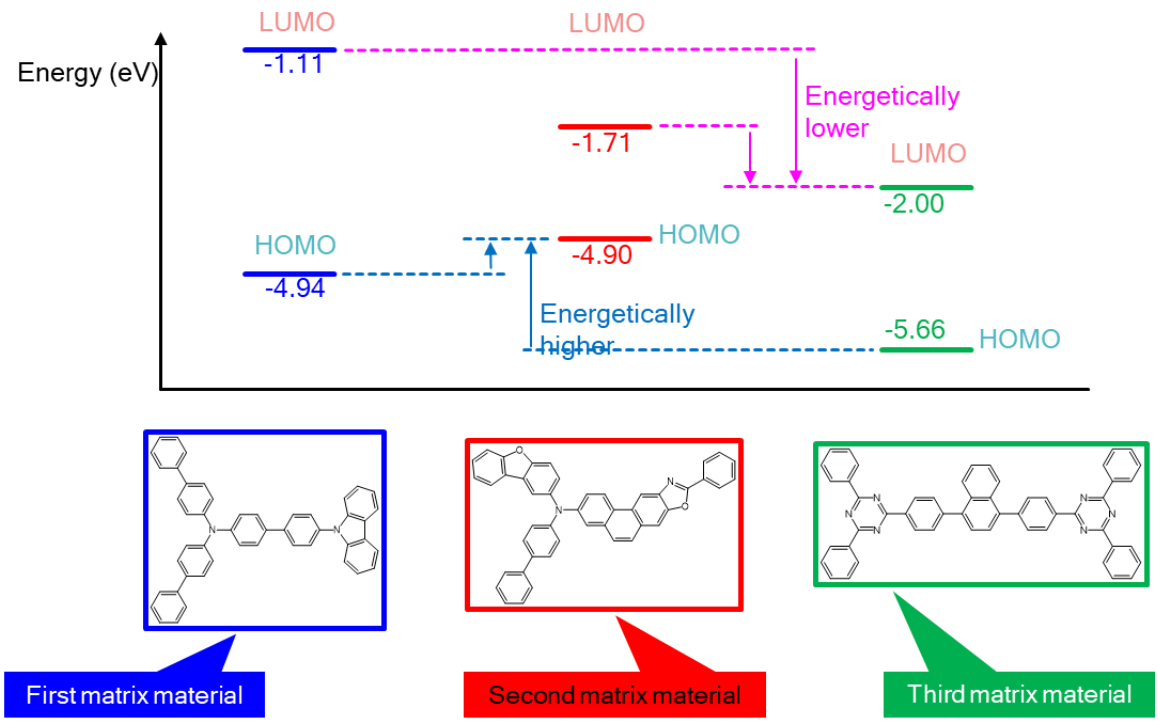
66. The ’164 Patent has been in full force and effect since its issuance. Pictiva owns by assignment the entire right, title, and interest in and to the ’164 Patent, including the right to seek damages for past, current, and future infringement thereof.

67. Pictiva is informed and believes, and on this basis alleges, that Samsung, agents of Samsung, and/or third parties acting under Samsung’s direction and control, have committed and continue to commit acts of direct infringement of the ’164 Patent literally and/or under the doctrine of equivalents by, among other things, making, using, selling, offering to sell, and/or importing within this district and elsewhere in the United States, without authority, products that infringe the ’164 Patent (the “’164 Accused Products”), including, for example, various Galaxy smartphones, computers, tablets, personal wear products, and/or other consumer electronic products.

68. On information and belief, the ’164 Accused Products infringe at least one claim of the ’164 Patent. By way of example, Samsung’s Galaxy S23 Ultra smartphone display panel includes all of the recited elements of claim 16, including “a substrate,” “a first electrode” (e.g., a cathode), “a second electrode” (e.g., an anode), and “at least one organic functional layer” located between the two electrodes and having at least three matrix materials, as shown in an example below:



wherein the third matrix material has a "Lowest Unoccupied Molecular Orbital (LUMO)," which is energetically lower than that of the first and second matrix materials, and wherein the second matrix material has a "Highest Occupied Molecular Orbital (HOMO)," which is energetically higher than that of the first and third matrix materials, and "the first matrix material has a charge carrier mobility which is lower than" that of the second and third matrix materials, as shown in an example below. Additionally, on information and belief, the first matrix material, with a wider bandgap than the second and third matrix materials, has a charge carrier mobility that is lower than the charge carrier mobilities of the second and third matrix materials.



69. Pictiva is informed and believes, and on this basis alleges, that Samsung has been and currently is inducing infringement of the ’164 Patent, in violation of 35 U.S.C. § 271(b), by intentionally aiding and encouraging third parties (including Samsung’s vendors, customers, and partners) to make, use, sell, or offer for sale in the United States and/or import into the United States the Accused Products, having known that the acts it was causing would infringe or have a high probability of infringing the ’164 Patent and with a specific intent that those performing the acts infringe the ’164 Patent.

70. As a result of Samsung’s infringement of the ’164 Patent, Pictiva has been damaged and will continue to be damaged. Pictiva is entitled to recover for damages sustained as a result of Samsung’s wrongful acts in an amount yet to be determined.

71. In addition, Samsung’s infringing acts and practices have caused and are causing immediate and irreparable harm to Pictiva.

72. Samsung has had actual knowledge of its infringement of the ’164 Patent since no later than August 2021. Pictiva is further informed, and on this basis alleges, that Samsung’s infringement of the ’164 Patent has been and continues to be deliberate and willful, and, therefore, this is therefore an exceptional case warranting an award of enhanced damages for up to three times the actual damages awarded and attorney’s fees to Pictiva pursuant to 35 U.S.C. §§ 284-285.

VIII. FIFTH CLAIM FOR RELIEF – INFRINGEMENT OF THE ’492 PATENT

73. Pictiva re-alleges and incorporates by reference the allegations of the preceding paragraphs of this Complaint as if fully set forth herein.

74. The ’492 Patent is entitled “Method for Producing a Passive Electronic Component, Method for Producing an Optoelectronic Assembly and Passive Electronic Component.” The ’492 Patent was filed as Application No. 14/430,942 on March 25, 2015, issued as a patent on February 9, 2016, and claims priority to, among others, PCT Application No. PCT/EP2013/067348, filed on August 20, 2013, which in turn claims priority to German Application No. 102012109142, filed on September 27, 2012. A true and correct copy of the ’492 Patent is attached as Exhibit 5.

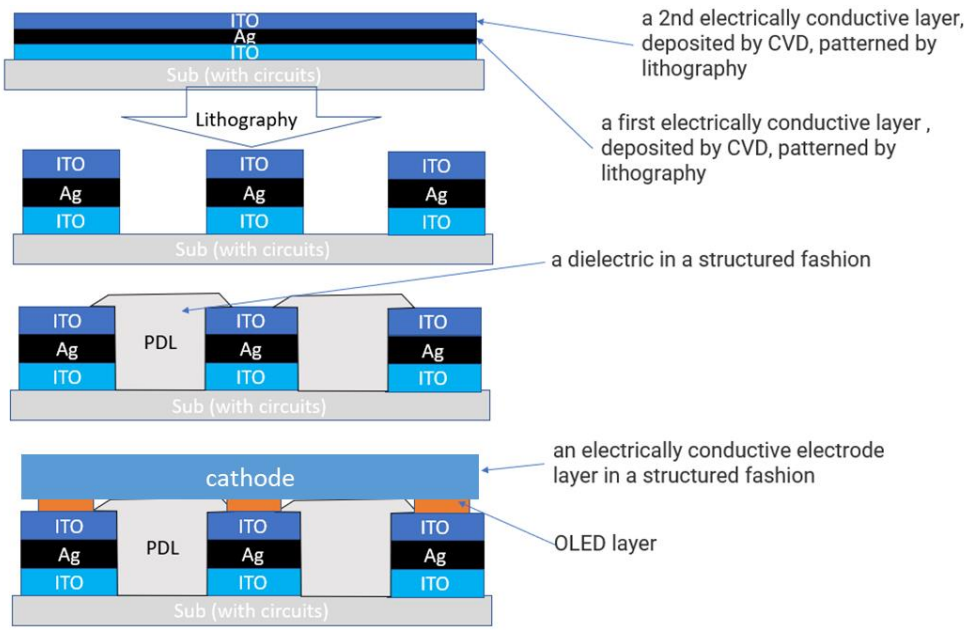
75. The ’492 Patent names Andrew Ingle as the sole inventor.

76. The ’492 Patent has been in full force and effect since its issuance. Pictiva owns by assignment the entire right, title and interest in and to the ’492 Patent, including the right to seek damages for past, current, and future infringement thereof.

77. Pictiva is informed and believes, and on this basis alleges, that Samsung, agents of Samsung, and/or third parties acting under Samsung’s direction and control, have committed and continue to commit acts of direct infringement under 35 U.S.C. §§ 271(a) and/or 271(g) of the ’492 Patent literally and/or under the doctrine of equivalents by, among other things, making, using, selling, offering to sell, and/or importing within this district and elsewhere in the United States, without authority, products that infringe the ’492 Patent (the “’492 Accused Products”),

including, for example, various Galaxy smartphones, computers, tablets, personal wear products, and/or other consumer electronic products, and, on information and belief, those products are not materially changed by subsequent process and have not become trivial and nonessential components of another product.

78. On information and belief, the '492 Accused Products infringe at least one claim of the '492 Patent. By way of example, Samsung's OLED display panel includes all of the recited elements of claim 16, including two "electrically conductive layer[s]" (e.g., the ITO layers of an anode), a trench in the two electrically conductive layers that "separates a first contact region from a second contact region," "a dielectric" (e.g., a pixel define layer ("PDL")) "applied in a structured fashion" such that "said dielectric electrically insulates" the two contact regions, and an "electrically conductive electrode layer" (e.g., a cathode) applied "on the dielectric above the first contact region and at least partly on the second contact region," as shown in an example below.



79. As another example, the Accused Products are made or include components that are made in accordance with one or more method claims of the '492 Patent. For example, the

process includes forming a first electrically conductive layer (such as the bottom ITO layer) on a substrate, forming a second electrically conductive layer (*e.g.*, the silver and top ITO layer) on the first electrically conductive layer, forming a first trench in the first and second electrically conductive layers via lithography such that the substrate is exposed in the first trench that separates a first contact region from a second contact region, applying a dielectric such as PDL in a structured fashion to the second electrically conductive layer in the first contact region and at least partly to the substrate in the first trench such that the dielectric electrically insulates the first contact region and the second contact region, and applying an electrically conductive electrode layer (such as the cathode layer) in a structured fashion to the PDL above the first contact region and to the second contact region, as demonstrated above. The products or components made in accordance with the claimed methods are not materially changed by subsequent processes and do not become a trivial and non-essential component of another product. Samsung imports the Accused Products made using the claimed methods into the United States without authorization, and/or sells, offers for sale or uses such Accused Products without authorization in the United States, in violation of 35 U.S.C. § 271(g).

80. Pictiva is informed and believes, and on this basis alleges, that Samsung has been and currently is inducing infringement of the ’492 Patent, in violation of 35 U.S.C. § 271(b), by intentionally aiding and encouraging third parties (including Samsung’s vendors, customers, and partners) to make, use, sell, or offer for sale in the United States and/or import into the United States the Accused Products, having known that the acts it was causing would infringe or have a high probability of infringing the ’492 Patent and with a specific intent that those performing the acts infringe the ’492 Patent under 35 U.S.C. §§ 271(a) and/or 271(g).

81. As a result of Samsung's infringement of the '492 Patent, Pictiva has been damaged and will continue to be damaged. Pictiva is entitled to recover for damages sustained as a result of Samsung's wrongful acts in an amount yet to be determined.

82. In addition, Samsung's infringing acts and practices have caused and are causing immediate and irreparable harm to Pictiva.

83. Samsung has had actual knowledge of its infringement of the '492 Patent since no later than the service of this First Amended Complaint. Pictiva is further informed, and on this basis alleges, that Samsung's infringement of the '492 Patent has been and continues to be deliberate and willful, and, therefore, this is therefore an exceptional case warranting an award of enhanced damages for up to three times the actual damages awarded and attorney's fees to Pictiva pursuant to 35 U.S.C. §§ 284-285.

IX. SIXTH CLAIM FOR RELIEF – INFRINGEMENT OF THE '425 PATENT

84. Pictiva re-alleges and incorporates by reference the allegations of the preceding paragraphs of this Complaint as if fully set forth herein.

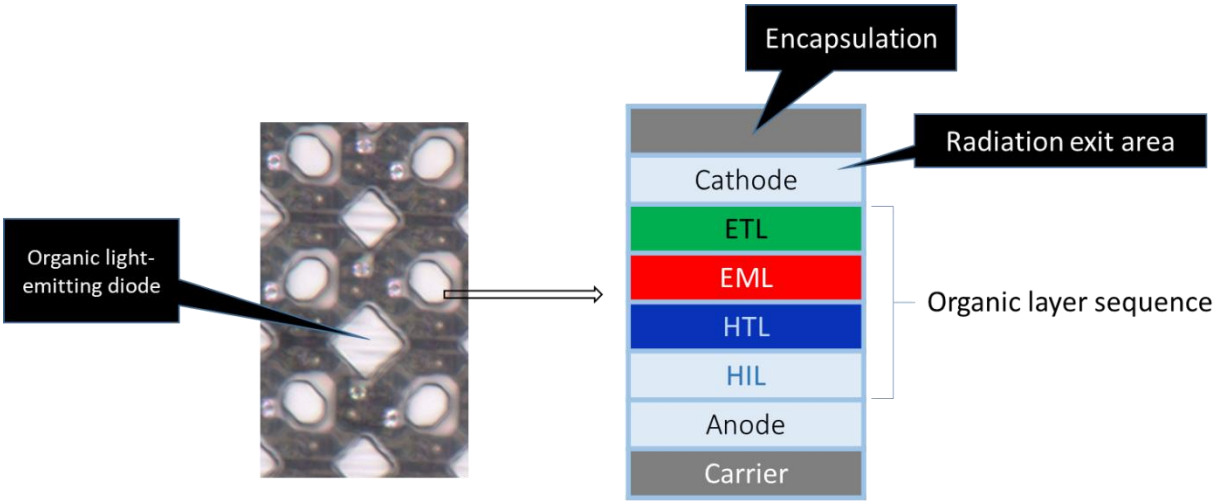
85. The '425 Patent is entitled "Organic-Light Emitting Diode." The '425 Patent was filed as Application No. 18/098,326 on January 18, 2023, issued as a patent on November 28, 2023, and claims priority to, among others, PCT Application No. PCT/DE2009/001741, filed on December 9, 2009, which in turn claims priority to German Application No. 102008061563.3, filed on December 11, 2008. A true and correct copy of the '425 Patent is attached as Exhibit 6.

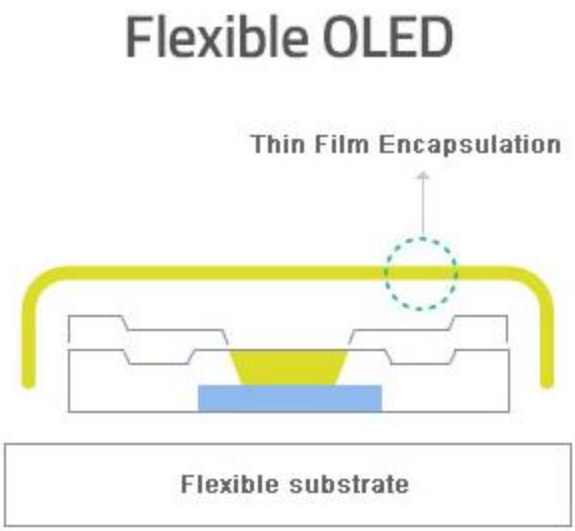
86. The '425 Patent names Ulrich Kastner-Jung, Markus Klein, Stan Maes, Romana Sigl, Annette Haid, Stephan Lintner, Julian Herget, and Gregor Matjan as co-inventors.

87. The '425 Patent has been in full force and effect since its issuance. Pictiva owns by assignment the entire right, title and interest in and to the '425 Patent, including the right to seek damages for past, current, and future infringement thereof.

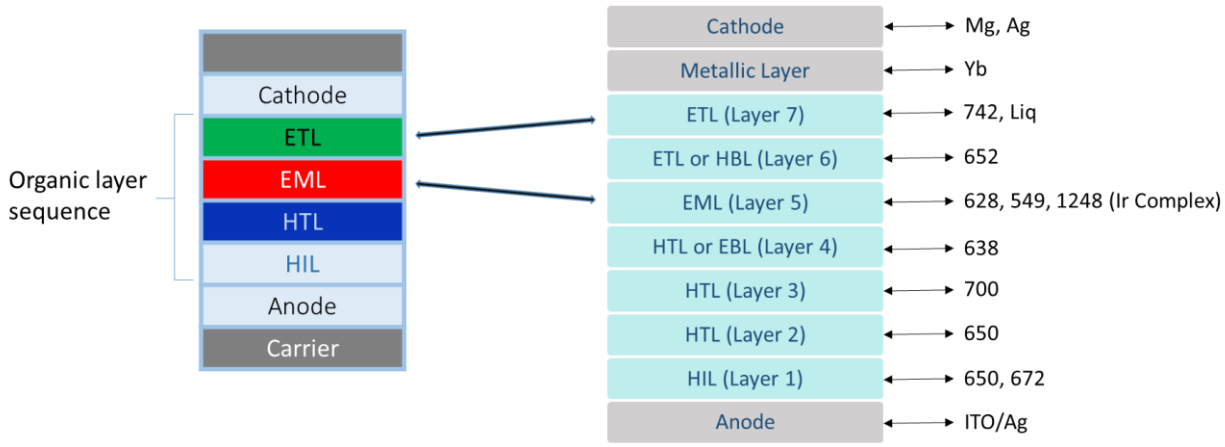
88. Pictiva is informed and believes, and on this basis alleges, that Samsung, agents of Samsung, and/or third parties acting under Samsung's direction and control, have committed and continue to commit acts of direct infringement of the '425 Patent literally and/or under the doctrine of equivalents by, among other things, making, using, selling, offering to sell, and/or importing within this district and elsewhere in the United States, without authority, products that infringe the '425 Patent (the "'425 Accused Products"), including, for example, various Galaxy smartphones, computers, tablets, personal wear products, and/or other consumer electronic products.

89. On information and belief, the '425 Accused Products infringe at least one claim of the '425 Patent. By way of example, Samsung's Galaxy S23 Ultra smartphone display panel includes all of the recited elements of claim 1, including "an organic light-emitting diode," which comprises "an organic layer sequence," which would include an emission or EML layer, "a radiation exit area" (e.g., a transparent cathode), and a thin-film "encapsulation," wherein "the organic layer sequence and the encapsulation are disposed on a carrier," as shown in an example below:





(https://www.samsungsdi.com/electronic-materials/oled/tfe-thin-film-encapsulation.html) wherein "the organic layer sequence comprises at least one radiation-emitting region", *e.g.*, the one or more pixel regions, that are configured to generate at least red, green, and blue electromagnetic radiations. These electromagnetic radiations are in the "spectrum range from infrared radiation to UV radiation during operation." Moreover, the electron transport layer (ETL) of the organic layer sequence is "n-doped" by Liq, and the emission layer (EML) includes one or more iridium-containing compounds, as shown in an example below:



90. Pictiva is informed and believes, and on this basis alleges, that Samsung has been and will continue inducing infringement of the ’425 Patent, in violation of 35 U.S.C. § 271(b), by intentionally aiding and encouraging third parties (including Samsung’s vendors, customers, and partners) to make, use, sell, or offer for sale in the United States and/or import into the United States the Accused Products, having known that the acts it was causing would infringe or have a high probability of infringing the ’425 Patent and with a specific intent that those performing the acts infringe the ’425 Patent.

91. As a result of Samsung’s infringement of the ’425 Patent, Pictiva has been damaged and will continue to be damaged. Pictiva is entitled to recover for damages sustained as a result of Samsung’s wrongful acts in an amount yet to be determined.

92. In addition, Samsung’s infringing acts and practices have caused and are causing immediate and irreparable harm to Pictiva.

93. Samsung has had actual knowledge of its infringement of the ’425 Patent since no later than filing of this First Amended Complaint. Pictiva is further informed, and on this basis alleges, that Samsung’s infringement of the ’425 Patent has been and continues to be deliberate and willful, and, therefore, this is therefore an exceptional case warranting an award of enhanced damages for up to three times the actual damages awarded and attorney’s fees to Pictiva pursuant to 35 U.S.C. §§ 284-285.

X. DEMAND FOR JURY TRIAL

94. Pursuant to Federal Rule of Civil Procedure 38(b), Pictiva hereby demands a trial by jury on all issues triable to a jury.

PRAYER FOR RELIEF

WHEREFORE, Pictiva respectfully requests that this Court enter judgment in its favor ordering, finding, declaring, and/or awarding Pictiva relief as follows:

A. that Samsung has infringed each of the Patents-in-Suit;

B. that Samsung continues to infringe the ’547, ’223, ’164, ’492, and ’425 Patents;

C. all equitable relief the Court deems just and proper as a result of Samsung’s infringement;

D. an award of damages adequate to compensate Pictiva for Samsung’s acts of infringement of the Patents-in-Suit, together with interest and costs in accordance with 35 U.S.C. § 284;

E. that Samsung’s infringement of the Patents-in-Suit was willful and that the damages awarded to Pictiva should be enhanced for up to three times the actual damages awarded pursuant to 25 U.S.C. § 284;

F. that this is an exceptional case and awarding Pictiva its reasonable attorneys’ fees pursuant to 35 U.S.C. § 285;

G. an accounting for acts of infringement and supplemental damages, without limitation, prejudgment and post-judgment interest; and

H. such other equitable relief which may be requested and to which Pictiva is entitled.

Dated: March 1, 2024

Respectfully submitted,

/s/ Jason G. Sheasby

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