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IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF NORTH CAROLINA  
Case No. 5:17-cv-00066-RLV-DSC

VENSON M. SHAW and STEVEN M. SHAW,  
  
Plaintiffs and Inventors,  
  
v.  
  
APPLE, INC.,  
  
SONY ELECTRONICS, INC., and  
  
SONY MOBILE COMMUNICATIONS (USA Inc.,  
  
Defendants.

**JURY TRIAL DEMANDED**

**INVENTORS' SECOND AMENDED COMPLAINT FOR  
PATENT INFRINGEMENT**

Plaintiffs/Inventors Venson M. Shaw and Steven M. Shaw (“Inventors”) submit this second amended Complaint against Defendants Apple, Inc., Sony Electronics, Inc., and Sony Mobile Communications (USA) Inc. (collectively, “Defendants”) and allege good faith infringement of U.S. Patent 6,359,241.

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X. INVENTORS' EXHIBITS

Exhibit #1: LinkedIn profiles claiming employment  
by Sony Electronics in Charlotte, North Carolina.....(Separate File Attachment)

Exhibit #2: LinkedIn profiles claiming employment  
by Sony Ericsson in Charlotte, North Carolina.....(Separate File Attachment)

Exhibit #3: LinkedIn profiles claiming employment  
by Sony Mobile Communications in North Carolina.....(Separate File Attachment)

Exhibit #4: US. Patent 6,359,241.....(Separate File Attachment)

Exhibit #5: Maintenance Fee Statement.....(Separate File Attachment)

Exhibit #6: Prosecution History.....(Separate File Attachment)

Exhibit #7: Certificate of Correction.....(Separate File Attachment)

Exhibit #8: Prior Art Search Results.....(Separate File Attachment)

Exhibit #9: Sony's Technological Highlights, "Exmor"

- High-Speed CMOS Sensor.....(Separate File Attachment)
- Exhibit #10: U.S. Patent 9,257,474 assigned to Sony.....(Separate File Attachment)
- Exhibit #11: U.S. Patent 9,282,269 assigned to Sony.....(Separate File Attachment)
- Exhibit #12: U.S. Patent 9,293,503 assigned to Sony.....(Separate File Attachment)
- Exhibit #13: Claim Chart.....(Separate File Attachment)

## **I. NATURE OF THIS ACTION**

1. The Inventors bring this action against Defendants to seek remedies, in good faith, for Defendants' infringement of U.S. Patent 6,359,241.

## **II. PARTIES TO THIS LITIGATION**

2. Inventor Dr. Venson M. Shaw is an accomplished researcher. Dr. Shaw is the named inventor of over one hundred (100) United States Patents, and Dr. Shaw has been a researcher for many of the world's most advanced technological companies (including Sharp Electronics, Honeywell, RCA, AT&T Bell Labs, Alcatel, and Nortel). Dr. Shaw was a visiting scientist at Stanford University and responsible for developing integrated design and test methodologies for sub-micron CMOS technologies. Dr. Shaw has designed CMOS ASICs and high density CMOS gate arrays. Dr. Shaw has also received many awards and served on standards committees. Dr. Shaw has a Ph.D. in Electrical Engineering and Computer Science from Johns Hopkins University, a Master of Science in Electrical Engineering from Johns Hopkins University, and a Bachelor of Science in Electrophysics (Semiconductor & Laser Devices) from National Chiao Tung University, Taiwan. Dr. Shaw also has a Master in Business Administration from Golden Gate University in San Francisco.
3. Inventor Steven M. Shaw is equally accomplished. Mr. Shaw is the named inventor of many United States Patents, and Mr. Shaw has many years of professional and technological experience. Mr. Shaw has a Master of Science in Chemical Engineering, a Master of Science in Environmental Engineering, and a Master in Business Administration.

4. Defendant Apple, Inc. (“Apple”) is a California corporation having its principal place of business at 1 Infinite Loop, Cupertino, California 95014. On information and belief, Apple exerts control over activities and processes associated with design, development, manufacture, and sale of computers, tablets, smartphones, and other mobile devices incorporating cameras and other imaging sensors (such as a charge coupled device or “CCD” and/or a complementary metal-oxide semiconductor or “CMOS”).
5. Defendant Sony Electronics, Inc. is a corporation duly organized and existing under the laws of Delaware. According to the North Carolina Secretary of State, Sony Electronics, Inc. has a “mailing address” of 25 Madison Avenue, Floor 26, New York, New York 10010. Also according to the North Carolina Secretary of State, Sony Electronics, Inc. has its principal place of business at 16535 Via Esprillo, San Diego, California 92127. According to its website, Sony Electronics, Inc. supplies audio/video electronics and information technology products for the consumer and professional markets. The operations include research and development, engineering, sales, marketing, distribution and customer service in the United States. Sony Electronics, Inc. thus exerts control over, and/or has responsibility for, the design, development, manufacture, and sale of CCD and CMOS imaging sensors.
6. Defendant Sony Mobile Communications (USA) Inc. is a corporation duly organized and existing under the laws of Delaware. According to the North Carolina Secretary of State, Sony Mobile Communications (USA) Inc. has its principal office at 2207 Bridgepointe Parkway, San Mateo, California 94404. According to its website, Sony Mobile Communications (USA) Inc. develops, engineers, markets, distributes, and sells

smartphones, tablet computers, smartwatches, and other products incorporating CCD and CMOS imaging sensors.

7. Upon information and belief, Defendants have a contractual, customer/supplier relationship to design, development, manufacture, supply, and sell computers, tablets, smartphones, and other mobile devices incorporating CCD and CMOS imaging sensors. For example, a teardown of an Apple iPhone 4S ("Model A1387") reveals that Sony supplies a front main camera (8.0 megapixels) having a CMOS construction, as the below photographs illustrate:





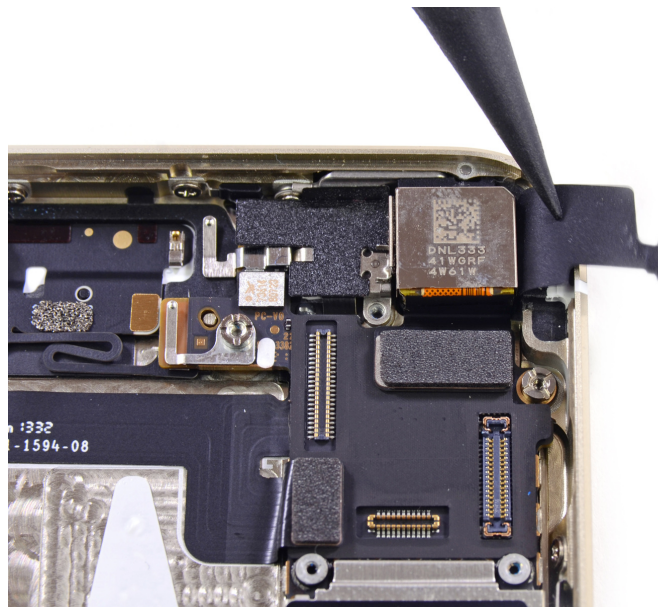
According to Chipworks, the camera was inspected using an infrared microscope, and the die markings reveal a “SONY” designation inside the camera, as the below picture shows:



8. The iPhone 5 also utilizes at least one image sensor supplied by either one or more of the Sony Defendants. For example, a teardown of an Apple iPhone 5 also reveals that Sony supplies a camera (8.0 megapixels) having a CMOS construction, as the below photograph illustrates:



9. The iPhone 5S also utilizes at least one image sensor supplied by either one or more of the Sony Defendants. For example, a teardown of an Apple iPhone 5S also reveals that Sony supplies a camera (8.0 megapixels) having a CMOS construction, as the below photograph illustrates:





The back of the camera is labeled DNL333 41WGRF 4W61W. According to Chipworks, “the DNL markings are consistent with the markings on the camera modules housing the Sony IMX145 we saw in the iPhone 4s and on the iPhone 5. The marks on the side of the module are different, but our industry insiders tell us this is Sony’s again.” The bottom of the camera is labeled AW32 65BD 4511 b763.

10. Upon information and belief, each of the Defendants import, develop, design, manufacture, distribute, market, offer to sell and/or sell infringing products and services in the United States, including in the State of North Carolina and in the Western District of North Carolina, and otherwise purposefully direct activities to the same. For example, according to Sony’s own press releases, Sony’s camera sensors are designed and manufactured in Japan. Sony’s camera sensors are then believed shipped to China and assembled by Foxconn as Apple’s products. Apple’s products are then shipped to the United States for distribution throughout the United States and in North Carolina. Apple’s products, containing Sony’s camera sensors, are then offered for sale and sold at retail stores in the Western District of North Carolina. Upon 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 or process.

### **III. JURISDICTION AND VENUE**

11. This Court has subject matter jurisdiction. This lawsuit is a civil action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1-390. This

Court has subject matter jurisdiction pursuant to 28 U.S.C. § 1331, § 1332, § 1338, and § 1367.

12. Venue is proper under 28 U.S.C § 1400 for Apple. Defendant Apple has committed acts of infringement and has a regular and established place of business in the State of North Carolina and in the Western District of North Carolina. For example, Apple has a data center at 5977 Startown Road, Maiden, North Carolina 28650. Apple also has several retail stores in North Carolina, including Charlotte, Greensboro, and Raleigh. Apple has a retail store located at 4400 Sharon Road, Charlotte, North Carolina 28211. Apple has another retail store located at 6801 Northlake Mall Drive, Charlotte, North Carolina 28216. These retail stores sold and/or sell infringing products, such as the Apple iPhone 4S, 5, and 5S above mentioned.
13. According to the North Carolina Secretary of State, Apple has a registered office in the State of North Carolina, and the office is located at 160 Mine Lake Court, Suite 200, Raleigh, North Carolina 27615-6417.
14. Apple has committed acts of patent infringement in the State of North Carolina and in the Western District of North Carolina. Apple has multiple regular and established places of business in the State of North Carolina and in the Western District of North Carolina at the time of service. Apple sold and/or sells infringing products, thus committing tortious acts of patent infringement causing injury within North Carolina and elsewhere.
15. Venue is also proper under 28 U.S.C § 1400 for Sony Electronics, Inc. and Sony Mobile Communications (USA) Inc. These Sony Defendants have also committed acts of infringement and have regular and established places of business in the State of North Carolina and in the Western District of North Carolina. For example, Inventors' **Exhibit**

#1 is a screenshot of LinkedIn profiles showing at least eight people who list their employer as “Sony Electronics” in the “Charlotte, North Carolina” area. These people broadly describe their job responsibilities as “sales,” “distribution,” “quality engineer,” “retail professional,” and “business application analyst.” Indeed, one person even claims to be a “warehouse manager.” **Exhibit #2** is another screenshot of a LinkedIn profile showing a “Senior Staff Engineer” who lists her/his employer as “Sony Ericsson” in the “Charlotte, North Carolina” area. Moreover, **Exhibit #3** reveals many other people in North Carolina who claim their employer is “Sony Mobile Communications.” Public information thus reveals that the Sony Defendants have employees in the Western District of North Carolina and in the State of North Carolina. Moreover, the public information reveals that the Sony Defendants have some kind of a “warehouse” and “retail” operation or presence in the Western District of North Carolina. So, even though the Sony Defendants contend that they have no corporate office nor regular and established place of business in North Carolina, social media reveals that the Sony Defendants have many employees in North Carolina and in the Western District. These facts thus evidence a permanent and continuous presence of business in the Western District and in North Carolina. These employees, and others as yet undiscovered, are believed to operationally contribute to the design, use, importation, and/or sales of infringing products.

16. Sony Electronics, Inc. regularly does business, or solicit business, in the State of North Carolina. For example, Sony Electronics, Inc. has been registered to do business in North Carolina for many years, and very recently Sony Electronics, Inc. changed its registered office to 2626 Glenwood Avenue, Suite 550, Raleigh, North Carolina 27608.

17. Sony Mobile Communications (USA) Inc. regularly does business, or solicit business, in the State of North Carolina. According to the North Carolina Secretary of State, Sony Mobile Communications (USA) Inc. (operating as its corporate predecessor “Sony Ericsson Mobile Communications (USA) Inc.”) has been licensed to do business in North Carolina since 2004. Sony Mobile Communications (USA) Inc. has a registered office in the State of North Carolina at 120 Penmarc Drive, Suite 118, Raleigh, North Carolina 27603-2400. Moreover, Sony Mobile Communications (USA) Inc. is also believed to assign legal work to law firms located in the State of North Carolina. These facts thus evidence a permanent and continuous presence of business in the Western District and in North Carolina.

#### IV. INVENTORS' PATENTED TECHNOLOGY

18. Inventors' **Exhibit #4** is an electronic copy of United States Patent 6,359,241. The '241 Patent was filed December 6, 1997 and issued March 19, 2002. The '241 patent is titled “Integrated Sensor and Memory Device for Memorizing Spatial Domain Event and Corresponding Time Domain Information.” The Inventors are Venson M. Shaw and Steven M. Shaw. The Inventors own the right, title, and interest in the '241 patent.
19. Inventors' **Exhibit #5** is a maintenance fee statement downloaded from the U.S.P.T.O. website. The Inventors have paid the maintenance fees that are required to keep the '241 Patent enforceable.
20. The '241 patent generally relates to sensors for detecting external events. The '241 patent expressly explains optoelectronic sensors, which detect light. These optoelectronic sensors generate electrical charge and/or signals in response to the light. The optoelectronic

sensors are arranged in an array and charged or driven according to time, thus allowing the optoelectronic sensors to sense the light. A memory device stores signals according to the time, thus preserving the time associated with the external events (*e.g.*, the light). The invention, in plain words, produces a sensor with improved performance.

21. Inventors' **Exhibit #6** is the prosecution history of the '241 Patent. The corresponding application was filed December 6, 1997 and assigned U.S. Application No. 08/986,291. The application was filed as a continuation-in-part (or "CIP") 08/208,992 filed March 11, 1994 (since issued as 5,745,598). A non-final Office Action was mailed April 2, 2000 and rejected claims 1-45 under § 112, second paragraph, for being indefinite and under § 103(a) as being obvious over *Anderson* with *Rydel*. An amendment was dated Sept. 28, 2000 and only amended the claims to overcome § 112 indefiniteness rejections. A Final Action was mailed November 22, 2000 and continued to reject claims 1-45 under § 103(a) as being obvious over *Anderson* with *Rydel*. An RCE was filed April 26, 2001 and amended several claims. A non-final Office Action was mailed June 28, 2001 rejecting claims 28-45 but allowing claims 1-5, 7-8, 10, 12-17, and 19-27 if amended to overcome an antecedent error in claim 1. A response was dated August 22, 2001 that amended independent claim 1 and that canceled claims 28-45.
22. Inventors' **Exhibit #7** is a Certificate of Correction submitted as further evidence of patent validity and good-faith infringement. The Certificate of Correction was recently submitted to correct mistakes in the claims.
23. Inventors' **Exhibit #8** is a prior art search conducted as further evidence of patent validity and good-faith infringement.

## V. ACCUSED PRODUCTS

24. Defendant Apple designs, manufactures, contract manufactures, markets, and sells products incorporating one or more CCD and/or CMOS imaging sensors via its website, via its retail stores, and via partnerships with other retailers (such as Best Buy).
25. Defendants Sony Electronics, Inc. and Sony Mobile Communications (USA) Inc. design, manufacture, market, and sell one or more CCD and/or CMOS imaging sensors as components in Apple's products. Defendants Sony Electronics, Inc. and Sony Mobile Communications (USA) Inc. also offer CCD and/or CMOS imaging sensors as components in Sony's own cameras, security systems, smartphones, tablet computers, and other products. Defendants Sony Electronics, Inc. and Sony Mobile Communications (USA) Inc. also supply CCD and/or CMOS imaging sensors as components in other original equipment manufacturers' products.
26. As this Complaint and Exhibits subsequently explain in great detail, the Inventors accuse any Apple products incorporating CCD and/or CMOS imaging sensors made, imported, and/or sold during the term of the '241 Patent. The Inventors' "Accused Products" thus include Apple iPhone models incorporating CCD and/or CMOS imaging sensors, such as the iPhone 3, 4, and 5 (including any "S," "C," and "Plus" models). The Inventors' "Accused Products" also include Apple iPod media players incorporating CCD and/or CMOS imaging sensors, such as the Nano and Touch models including a front and/or a rear camera. The Inventors' "Accused Products" also include Apple desktop computers incorporating CCD and/or CMOS imaging sensors, such as the iMac having an iSight or Facetime camera. The Inventors' "Accused Products" also include Apple notebook computers incorporating CCD and/or CMOS imaging sensors, such as the MacBook and

- MacBook Air models having the iSight or Facetime camera. The Inventors' Accused Products" also include Apple tablet computers incorporating CCD and/or CMOS imaging sensors, such as the iPad, iPad Air, and iPad Mini models having front and/or rear cameras.
27. The Inventors also accuse any and all Sony products and vision systems incorporating CCD and/or CMOS imaging sensors. For example, the Inventors' "Accused Products" include all products utilizing the Exmor, Exmor R, and Exmor RS technologies and models (such as the IMX, ISX, and IU families). The Inventors' Accused Products" also include all "Xperia" smartphones, "Xperia" tablet computers, and cameras incorporating CCD and/or CMOS imaging sensors.

**VI. COUNT 1: INFRINGEMENT OF U.S. PATENT 6,359,241**

28. The Inventors reallege, adopt, and incorporate by reference the allegations of above paragraphs 1-27 as if fully set forth herein.
29. On information and belief, the Inventors allege, in good faith, that Defendants Apple, Inc., Sony Electronics, Inc. and Sony Mobile Communications (USA) Inc. have infringed and/or are currently infringing one or more claims of the '241 Patent, including but not limited to claims 1-5 and 7-23, in violation of 35 U.S.C. § 271, by making, using, selling, offering for sale, and/or importing into the United States, without authority, the Accused Products.
30. This litigation involves components that are too small to be seen or visually inspected. For example, Apple advertises the iPhone 4S as having an "8-megapixel camera," implying eight million (8,000,000) pixels are fabricated on a small chip (approximately 6.0 millimeters square). The Accused Products thus contain microscopic details that cannot be readily or reasonably seen or observed.

31. Inventors' **Exhibit #9** is a Sony document highlighting the technological aspects of the "Exmor" CMOS sensor. Because the Accused Products contain microscopic details, the Inventors present Exhibit #9 as evidence of infringement. Upon information and belief, Inventors' Exhibit #9 at least partially describes the infringing componentry and/or functionality.
32. Inventors' **Exhibit #10** is United States Patent 9,257,474 assigned to Sony. Again, because the Accused Products contain microscopic details, the Inventors present Exhibit #10 as evidence of infringement. Upon information and belief, the Inventors' Exhibit #10 discusses technical details related to imaging sensors used in the Accused Products.
33. Inventors' **Exhibit #11** is United States Patent 9,282,269 assigned to Sony. Again, because the Accused Products contain microscopic details, the Inventors present Exhibit #11 as evidence of infringement. Upon information and belief, the 'Inventors' Exhibit #11 discusses technical details related to imaging sensors used in the Accused Products.
34. Inventors' **Exhibit #12** is United States Patent 9,293,503 assigned to Sony. Again, because the Accused Products contain microscopic details, the Inventors present Exhibit #12 as evidence of infringement. Upon information and belief, the Inventors' Exhibit #12 discusses technical details related to imaging sensors used in the Accused Products.
35. Inventors' **Exhibit #13** is a claim chart detailing the manner in which the Accused Products infringe claims 1-5 and 7-23 of the '241 Patent. Because the Accused Products contain microscopic details, the Inventors' infringement analysis and Exhibit #13 are preliminary and ongoing. The Inventors reserve the right to provide additional theories under which the Defendant's products infringe the '241 patent.



36. Should any of the Defendants contend that any element of an asserted claim is not literally present in the Accused Products, the Inventors allege, in good faith, that such element is present under the doctrine of equivalents, as any alleged differences are insubstantial in componentry and/or functionality.
37. Because the Defendants infringe claims 1-5 and 7-23 of the '241 Patent, the Inventors have suffered and will continue to suffer. The inventors are entitled to recover damages for infringement in an amount subject to proof at trial, but not less than a reasonable royalty.
38. The Inventors seek injunctive relief as equity permits.

#### **VII. INVENTORS' DEMAND FOR JURY TRIAL**

39. The Inventors respectfully demand a jury for all triable issues.

#### **VIII. INVENTORS' REQUEST FOR RELIEF**

40. The Inventors respectfully request an entry of judgment that the Defendants infringe one or more claims of the '241 Patent.
41. The Inventors respectfully request an injunction that enjoins the Defendants from further acts of infringement.
42. An award of all damages that are adequate to compensate the Inventors for infringement, including interest (including pre- and post-judgment) as maximally permitted by law.
43. Further relief as the Court deems just and proper.

**IX. SIGNATURE PAGE**

Here concludes this Second Amended Complaint for Good Faith Infringement of U.S.  
Patent 6,359,241.

Respectfully submitted on September 1, 2017,

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## **CERTIFICATE OF SERVICE**

Pursuant to LCvR 5.3, I hereby certify that on September 1, 2017, the foregoing **SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT** was electronically filed with the Clerk of the Court using the Electronic Case Filing system, which automatically generates a "Notice of Electronic Filing" to all counsel of record registered in this case.

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