

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS

RAH COLOR TECHNOLOGIES LLC,

Plaintiff,

v.

SAMSUNG ELECTRONICS CO., LTD.

Defendant.

Civil Action No.

JURY TRIAL DEMANDED

COMPLAINT

This is an action for patent infringement arising under the patent laws of the United States, Title 35 of the United States Code and relates to five U.S. patents owned by RAH Color Technologies LLC (“RAH Color Technologies”): U.S. Patent Nos. 8,279,236; 9,404,802; 9,516,288; 8,638,340; and 7,830,546 (collectively, the “Patents-in-Suit”).

THE PARTIES

1. Plaintiff RAH Color Technologies is a limited liability company organized under the laws of the Commonwealth of Virginia. RAH Color Technologies maintains an office at 7012 Colgate Drive, Alexandria, Virginia 22307. RAH Color Technologies owns numerous United States patents generally related to the field of color management. Dr. Richard A. Holub manages RAH Color Technologies and is a named inventor of the Patents-in-Suit.

2. Defendant Samsung Electronics Co., Ltd. (“SEC”) is a company organized and existing under the laws of the country of the Republic of Korea, with its principal

place of business located at 129 Samsung-ro, Yeongtong-gu, 443-742, Suwon, Republic of Korea. On information and belief, SEC can be served with process at that address.

3. SEC manufactures, makes, uses, sells, imports, and offers for sale color displays, digital cameras, smartphones and tablets with cameras, and other hardware and software that employ color measurement and management techniques in the U.S.

JURISDICTION AND VENUE

4. This Complaint states causes of action for patent infringement arising under the patent laws of the United States, 35 U.S.C. § 100 *et seq.*, and, more particularly 35 U.S.C. § 271.

5. This Court has subject matter jurisdiction of this action under 28 U.S.C. §§ 1331 and 1338(a) in which the district courts have original and exclusive jurisdiction of any civil action for patent infringement.

6. Defendant is subject to this Court's general personal jurisdiction pursuant to due process and/or the Illinois Long Arm Statute, Illinois Statutes 735 § 5/2-209, due at least to its substantial business conducted in this District, including: (i) having transacted business within the State of Illinois and attempted to derive financial benefit from residents of the State of Illinois in this District, including benefits directly related to the instant patent infringement causes of action set forth herein; (ii) having placed its products and services into the stream of commerce throughout the United States and having been actively engaged in transacting business in Illinois and in this District, and (iii) having committed the complained of tortious acts in Illinois and in this District.

7. SEC, directly and/or through subsidiaries and agents (including distributors, retailers, and others), makes, imports, ships, distributes, offers for sale, sells,

uses, and advertises (including offering products and services through its website, <http://www.samsung.com/us/mobile/phones/>, as well as other retailers) its products and/or services in the United States, the State of Illinois, and the Northern District of Illinois. For example, SEC's website at <http://www.samsung.com/us/mobile/phones/> states that "Samsung, Galaxy S, Samsung Gear, and Shop Samsung are all trademarks of Samsung Electronics Co., Ltd."

8. SEC, directly and/or through its subsidiaries and agents (including distributors, retailers, and others), has purposefully and voluntarily placed one or more of its infringing products and/or services, as described below, into the stream of commerce with the expectation that they will be purchased and used by consumers in the Northern District of Illinois. These infringing products and/or services have been and continue to be purchased and used by consumers in the Northern District of Illinois. SEC has committed acts of patent infringement within the State of Illinois and, more particularly, within the Northern District of Illinois.

9. This Court's exercise of personal jurisdiction over SEC is consistent with Illinois Long Arm Statute, Illinois Statutes 735 § 5/2-209, and traditional notions of fair play and substantial justice.

10. Venue is proper in this District under 28 U.S.C. §§1391(b) and 1400(b) because SEC is subject to personal jurisdiction in this District and SEC may be sued in any judicial district under §1391(b)(3) and §1391(c)(3).

BACKGROUND FACTS REGARDING RAH COLOR TECHNOLOGIES

11. RAH Color Technologies is owned by Dr. Richard A. Holub, who is a named inventor of all its patent assets. Dr. Holub holds a Ph.D. in Neurophysiology and

has studied and worked extensively in the fields of vision and color reproduction for nearly fifty years.

12. For example, between 1983 and 1994, Dr. Holub worked for several leading companies including Eastman Kodak (following its acquisition of Eikonix Corp., which Dr. Holub joined in 1983), Compugraphics (a subsidiary of Agfa/Bayer AG) and SuperMac Technologies where he served as Chief Color Scientist, Technology Consultant, and Principal Engineer, respectively, and had responsibility for developing and/or managing development of color technologies for new products.

13. Dr. Holub has additionally been a leader in development, research, and education in the graphic arts industry.

14. For example, for ten consecutive years beginning in 1993-94, Dr. Holub was elected to and served on the Board of Directors of The Technical Association of the Graphic Arts (“TAGA”), now a part of the Printing Industries of America. For nine of those ten years, Dr. Holub was an officer, serving three years as Technical Vice President and Papers Chair, two years as Executive Vice President, two years as President and two years as Immediate Past President. During his three years as Technical VP, Dr. Holub organized four technical conferences, including TAGA’s first-ever international conference, and, in addition, TAGA’s contributions to the Graphic Arts Show Company’s “Concepts” Conference in two successive years.

15. Between 1995 and 1998, Dr. Holub taught in various instructional programs at Rochester Institute of Technology, especially taking responsibility for research methods courses offered to Master’s students pursuing the technology concentration in the School of Printing Management and Sciences (subsequently renamed

the School of Print Media). During that time he served on thesis committees for a number of students in the Master's program. Many graduates of that program hold significant positions in the publishing and printing industries. In addition, during the early 1990's, Dr. Holub served as a key technical contributor to early standards developed by CGATS, the Committee for Graphic Arts Technical Standards.

16. Spanning almost two decades, Dr. Holub's R&D work (alone and with collaborators) resulted in 11 papers presented to TAGA's Annual Technical Conference, all of which subsequently appeared in published Conference *Proceedings*. His research also resulted in the contribution of at least four (4) important papers to refereed journals, including the *Journal of Imaging Technology* and *Color Research and Application*, as well as contributions to symposia organized by The Society for Imaging Science and Technology (IS&T), the Society of Photo-Optical Instrumentation Engineers (SPIE), and the Institute of Electrical and Electronics Engineers (IEEE).

17. In 1994, Dr. Holub began work on a new business that would leverage inventive developments in color measurement, imaging system architecture, user-interface and color reproduction technologies to implement open and accurate color reproduction in a networked environment. Over the next several years, Dr. Holub rented laboratory/demo space from RIT Research Corp., hired students from the Rochester Institute of Technology as well as software and hardware contractors to assist him in developing a first product prototype. The prototype combined instrumentation for fully automatic display calibration with software support for highly accurate soft-proofing. During this time, he also prepared and filed the first two in a series of significant patent disclosures to cover implementations of inventive concepts.

18. Dr. Holub formed Imagicolor Corporation in 1998 to commercialize his prototype described above in paragraph 17. Further efforts at business development continued, however, investment did not materialize and Imagicolor was eventually dissolved.

19. Though commercialization of the prototype did not come to fruition, Dr. Holub continued to innovate, and pursue patents on those innovations, with the United States Patent Office. In 2005, RAH Color Technologies LLC was formed as a vehicle for an on-going licensing program for companies whose products depend on Dr. Holub's innovations.

**BACKGROUND FACTS REGARDING THE RAH COLOR TECHNOLOGIES
PATENT PORTFOLIO**

20. The United States Patent Office has awarded Dr. Holub 30 patents to date, including the following Patents-in-Suit:

- United States Patent No. 8,279,236, entitled "Methods and Apparatus for Calibrating a Color Display" (the '236 Patent);
- United States Patent No. 9,404,802, entitled "System for Distributing and Controlling Color Reproduction at Multiple Sites" (the '802 Patent);
- United States Patent No. 9,516,288, entitled "Color Calibration of Color Image Rendering Devices" (the '288 Patent);
- United States Patent No. 8,638,340, entitled "Color Calibration of Color Image Rendering Devices" (the '340 Patent); and
- United States Patent No. 7,830,546, entitled "System for Distributing and Controlling Color Reproduction at Multiple Sites" (the '546 Patent).

21. The United States Patent Office has considered nearly 500 references during the prosecution of Dr. Holub's patent applications.

22. Hundreds of subsequently filed patent applications by third parties have cited to Dr. Holub's patents.

23. RAH Color Technologies has licensed the technology covered by its patents to seven of the largest manufacturers and service providers of color imaging and printing products for consumer and professional segments in the world. RAH Color Technologies has also licensed its innovations to two additional manufacturers with extensive experience in the color measurement and management space. Additionally, 13 major companies have entered into end-user license agreements with RAH Color Technologies.

24. These industry-leading companies have each recognized the contributions Dr. Holub has made to the fields of color management, remote proofing, and measurement and control of color product quality.

25. All right, title, and interest in the Patents-in-Suit are held by RAH Color Technologies.

SEC'S KNOWLEDGE OF THE PATENTS-IN-SUIT, HOW SEC INFRINGES THEM, AND SEC'S CONTINUED INFRINGEMENT DESPITE THAT KNOWLEDGE

26. On February 10, 2016, counsel for RAH Color Technologies (Global IP Law Group, LLC) sent a three-page letter to SEC's licensing director Jack Kyonghwa Chong, offering SEC a license to RAH Color Technologies' patents. The letter indicated that SEC was using RAH Color Technologies' patented technologies, identified the '340 and '546 as being infringed, and identified the specific SEC products RAHCT contends infringes them.

27. On March 10, 2016, the director of SEC's Licensing Team, Mr. Jun Hong Park, sent counsel for RAH Color Technologies an email requesting additional information on how SEC's products infringed at least the '340 and '546 patents.

28. On April 26, 2016 counsel for RAH Color Technologies provided Mr. Park with claim charts detailing how SEC's products infringe the '340, '546, and '236 patents.

29. On August 17, 2016, counsel for RAH Color Technologies met with Mr. Park at SEC's offices in Seoul, South Korea.

30. On August 21, 2016, RAH Color Technologies and SEC entered into an NDA.

31. On September 28, 2016 counsel for RAH Color Technologies provided SEC with claim charts detailing how SEC's products infringe the '288 and '802 patents.

32. SEC has not entered into a license agreement with RAH Color Technologies.

33. SEC has in the past and continues to directly infringe the asserted claims of the Patents-in-Suit pursuant to 35 U.S.C. § 271 by using methods and using, making and importing systems, software, and apparatuses covered by the asserted patent claims identified below.

COUNT I: INFRINGEMENT OF U.S. PATENT '236 CLAIM 1

34. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33 of this Complaint as though set forth in full herein.

35. Claim 1 of the '236 Patent provides:

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| Claim 1 | A computer-readable storage medium encoded with a computer |
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| Preamble | program comprising: |
| Element A | one or more screens displayable at a first computer enabling collection of data characterizing at least the effects of viewing conditions on color reproduction by a rendering device associated with said first computer, wherein at least said data collected is used in computing a first gamut for said rendering device; and |
| Element B | software providing a comparison of said first gamut with a second gamut of colors for reproduction by said rendering device, said second gamut of colors being provided by a second computer employing a network protocol, wherein said collection of data is enabled by at least one of instrumental measurement or subjective visual judgments. |

36. “SEC Accused Mobile Devices” include SEC Galaxy S7, Galaxy S7 Edge, and other mobile devices that include Adaptive Display Technology, as well as hardware and software that include the same or equivalent functionality described in paragraphs 37-39 of Count I, paragraphs 46-47 of Count II, paragraph 53 of Count III, paragraph 59 of Count IV, paragraphs 66-71 of Count V, paragraph 77 of Count VI, paragraph 83 of Count VII, paragraph 89 of Count VIII, paragraphs 95-105 of Count IX, paragraph 111 of Count X, paragraphs 117-118 of Count XI, paragraph 124 of Count XII, and paragraphs 130-132 of Count XIII.

37. SEC Accused Mobile Devices include memory encoded with a computer program.

38. SEC Accused Mobile Devices have a screen through which the SEC Accused Mobile Devices enable the collection of ambient light using an RGB sensor and automatic brightness control. The RGB sensor determines the amount and quality of the ambient light and the effects of the ambient light on how the SEC Accused Mobile Devices display colors.

39. The SEC Accused Mobile Devices' Adaptive Display technology uses the ambient light data from the RGB sensor to calculate an appropriate color gamut for display. Upon information and belief, SEC Accused Mobile Devices compare the calculated color gamut with a second gamut, such as the sRGB color gamut of images provided by websites and viewed on the SEC Accused Mobile Devices' display.

40. SEC directly infringes claim 1 of the '236 Patent when making, using, offering to sell, selling, and/or importing the SEC Accused Mobile Devices.

41. SEC infringes claim 1 of the '236 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

42. SEC has had knowledge of the '236 Patent, and knowledge of RAH Color Technologies' specific allegations of how SEC Accused Mobile Devices infringe claim 1 of the '236 patent since at least April 26, 2016.

43. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT II: INFRINGEMENT OF U.S. PATENT '236 CLAIM 5

44. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-43 of this Complaint as though set forth in full herein.

45. Claim 5 of the '236 Patent provides:

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| Claim 5 | The computer-readable storage medium according to claim 1 wherein said measurement or said judgments are representable in standard units based in human color vision. |
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46. SEC Accused Mobile Devices' RGB light sensor measures the intensity of red, green, and blue light. These measurement values can be represented in R, G, B standard color units (e.g., xyz chromaticity coordinates) that bear a mathematical relationship to defined CIEXYZ color values.

47. Both xyz and CIEXYZ color values are based in human color vision.

48. SEC infringes claim 5 of the '236 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

49. SEC has had knowledge of the '236 Patent, and knowledge of RAH Color Technologies' specific allegations of how SEC Accused Mobile Devices infringe claim 5 of the '236 patent since at least April 26, 2016.

50. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT III: INFRINGEMENT OF U.S. PATENT '236 CLAIM 6

51. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-50 of this Complaint as though set forth in full herein.

52. Claim 6 of the '236 Patent provides:

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| Claim 6 | The computer-readable storage medium according to claim 5 further comprising software for rendering colors of said second gamut on said rendering device responsive to said comparison. |
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53. SEC Accused Mobile Devices display color images obtained from websites by adjusting the gamut of the display of the SEC Accused Mobile Devices based

on ambient light conditions recorded by the RGB sensor in order to match the gamut of color images more accurately. For example, the default gamut for web images is sRGB or Standard RGB color space. This default gamut provides a comparison gamut to be matched when rendering images received from the web.

54. SEC infringes claim 6 of the '236 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

55. SEC has had knowledge of the '236 Patent, and knowledge of RAH Color Technologies' specific allegations of how SEC Accused Mobile Devices infringe claim 6 of the '236 patent since at least April 26, 2016.

56. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT IV: INFRINGEMENT OF U.S. PATENT '236 CLAIM 12

57. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-43 of this Complaint as though set forth in full herein.

58. Claim 12 of the '236 Patent provides:

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| Claim 12 | The computer-readable storage medium according to claim 1 wherein said first computer and said second computer communicate employing client-server protocols. |
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59. SEC Accused Mobile Devices communicate with other computers, such as website servers. This communication uses client-server protocols.

60. SEC infringes claim 12 of the '236 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

61. SEC has had knowledge of the '236 Patent, and knowledge of RAH Color Technologies' specific allegations of how SEC Accused Mobile Devices infringe claim 12 of the '236 patent since at least April 26, 2016.

62. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT V: INFRINGEMENT OF U.S. PATENT '802 CLAIM 1

63. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33 and 36 of this Complaint as though set forth in full herein.

64. Claim 1 of the '802 Patent provides:

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| Claim 1 Preamble | A digital image processing system comprising: |
| Element A | a camera comprising a two-dimensional array of sensing elements that captures two-dimensional images of scenes in a plurality of channels to provide digital image data representative of said two-dimensional images, wherein at least one of said scenes comprise one or more objects that are in motion with respect to said camera; |
| Element B | at least one video display adapted to render said two-dimensional images in color and to display a user interface enabling control of said system and expression of preferences for image processing, wherein said user interface provides graphical representations of functions that are moveable upon said video display by a user and initiate execution of programs to perform said functions when selected by a user; |
| Element C | a sensor that enables measurement of at least the level of ambient light, wherein said sensor is distinct from said camera and integrable with said system; |

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| Element D | one or more processors that execute one or more programs for controlling said camera and said sensor, for utilizing said measurement of at least the level of ambient light in the control of rendering on said at least one video display, for storing said digital image data in a file, and for converting said digital image data in said plurality of channels into values for rendering on one or more rendering devices comprising said at least one video display; and |
| Element E | an interface to an external computer system enabling transfer of at least said file, said file having a header and fields of data comprising information related to processing of said digital image data. |

65. SEC Accused Mobile Devices are digital image processing systems.

66. SEC Accused Mobile Devices have dual image sensors that capture images and records video in two dimensions in red, green, and blue color channels. The images and/or video are then converted into digital image data that can then be rendered in color on the display of the SEC Accused Mobile Devices.

67. SEC Accused Mobile Devices include a user interface that provides various image processing settings, and that provides icons of applications that a user can move to different locations on the display and can tap to launch.

68. SEC Accused Mobile Devices have an RGB sensor that measures ambient light, and have a processor for executing programs that use the measured ambient light to control how colors are displayed, such as Adaptive Display mode. Adaptive Display mode adjusts colors and white balance, among others, to render colors appropriate for any given lighting or viewing conditions.

69. The SEC Accused Mobile Devices' processor is also used for executing programs that control the SEC Accused Mobile Devices' camera and RGB sensor, as

well as programs that store digital images as files, and convert digital image data into sRGB values useable for display on the SEC Accused Mobile Devices' screen.

70. SEC Accused Mobile Devices have a USB connector for connecting external devices and transferring image files.

71. The image files created by SEC Accused Mobile Devices comply with the Exif 2.2 specification, and have a header and fields of data that include information related to any image processing settings used, such as color space, exposure mode, scene capture type, and white balance.

72. SEC infringes claim 1 of the '802 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

73. SEC has had knowledge of the '802 Patent, and knowledge of RAH Color Technologies' specification allegations of how SEC Accused Mobile Devices infringe claim 1 of the '802 Patent since at least September 28, 2016.

74. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT VI: INFRINGEMENT OF U.S. PATENT '802 CLAIM 4

75. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33, 36 and 63-74 of this Complaint as though set forth in full herein.

76. Claim 4 of the '802 Patent provides:

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| Claim 4 | The system according to claim 1 wherein said interface comprises a Universal Serial Bus interface and a network interface in which |
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| | said network interface enables at least partly wireless communication employing one or more network protocols. |
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77. SEC Accused Mobile Devices have both a USB interface and a network interface, with the network interface allowing for wireless transfer of data to and from the SEC Accused Mobile Devices.

78. SEC infringes claim 4 of the '802 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

79. SEC has had knowledge of the '802 Patent since at least September 28, 2016.

80. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT VII: INFRINGEMENT OF U.S. PATENT '802 CLAIM 8

81. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33, 36 and 63-74 of this Complaint as though set forth in full herein.

82. Claim 8 of the '802 Patent provides:

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| Claim 8 | The system according to claim 1 further comprising a program executed by one of said one or more processors that transforms said two-dimensional images into calibrated RGB coordinates for storage in said file. |
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83. SEC Accused Mobile Devices store image files as JPG files in the calibrated RGB coordinates of the sRGB color space. The stored image files are derived from the two-dimensional image data obtained by the camera.

84. SEC infringes claim 8 of the '802 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

85. SEC has had knowledge of the '802 Patent since at least September 28, 2016.

86. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT VIII: INFRINGEMENT OF U.S. PATENT '802 CLAIM 9

87. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33, 36, 63-74 and 81-86 of this Complaint as though set forth in full herein.

88. Claim 9 of the '802 Patent provides:

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| Claim 9 | The system according to claim 8 further comprising one or more programs for controlling tone reproduction and saturation of colors rendered upon said at least one video display. |
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89. SEC Accused Mobile Devices have a Camera app that includes different style filters that control how colors are rendered by modifying color tones and color saturation.

90. SEC infringes claim 9 of the '802 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

91. SEC has had knowledge of the '802 Patent since at least September 28, 2016.

92. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT IX: INFRINGEMENT OF U.S. PATENT '288 CLAIM 1

93. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33 and 36 of this Complaint as though set forth in full herein.

94. Claim 1 of the '288 patent provides:

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| Claim 1 Preamble | A hand-held multifunctional digital apparatus comprising: |
| Element A | a controller comprising at least one programmable processor; |
| Element B | a plurality of sensors, wherein one or more of said sensors comprise a camera enabling capture of images and video streams of said images in a plurality of color channels, said images captured by said one or more sensors represent different fields of view; |
| Element C | memory for storing control programs for operating said apparatus and enabling a user interface, application programs for providing multifunctional capability, at least location information, and images and audio data in digital form; |
| Element D | a color display having a screen, said color display being operable to present menus of said user interface, to provide a viewfinder for displaying one or more of said images, and to display one or more of text and graphics associated with execution of one or more of said application programs, wherein when a user faces said screen said different fields of view comprise at least a first field of view directed to the user and a |

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| | second field of view directed away from the user; |
| Element E | an audio unit comprising one or more speakers and one or more microphones, said audio unit enabling the user to operate at least one of said application programs by speaking to the apparatus, wherein the apparatus confirms said operation by at least speaking to the user; |
| Element F | a transmitter a receiver for enabling, via an antenna, one or more of cellular telephony, or communication with an external system using one or more network protocols; |
| Element G | a connector for interfacing said apparatus with an external device; |
| Element H | software comprising at least: |
| Element I | an operating program that controls the functions of said apparatus responsive, in part, to inputs through the user interface; |
| Element J | one or more programs providing said user interface that renders on said color display graphic representations of functions for user selection and that employs speech recognition and computer generated speech to implement spoken interaction between the user and said apparatus using said audio unit, said apparatus assists the user in performing a task by guiding user performance through spoken directions by the apparatus; and |
| Element K | one or more programs for converting at least one of said images in a plurality of color channels into digital image data and for storing said digital image data in a file having a header and tags identifying fields of data that enable a receiver of said file to process said digital image data. |

95. SEC Accused Mobile Devices are designed to be held in the hand, and have processors. For example, the Galaxy S7 has a quad-core processor.

96. SEC Accused Mobile Devices have multiple camera sensors for capturing images and videos in color, with the cameras facing both forwards and back to provide different fields of view, with one facing a user and the other facing away from the user.

97. SEC Accused Mobile Devices have memory that stores software and an operating system that provide a user interface, stores apps for performing various functions, stores location information such as GPS tags, and stores digital images and audio.

98. SEC Accused Mobile Devices have a color display that shows various menus and applications as part of the user interface, that provides a viewfinder function when previewing images or video to capture using one of the cameras, and that displays various text and graphics for controlling applications.

99. SEC Accused Mobile Devices have speakers and microphones that can be used for voice commands. For example, the Galaxy S7 includes S-Voice for operating the phone using voice commands. In response to a command, the Galaxy S7 provides a spoken response.

100. SEC Accused Mobile Devices have radio frequency transceivers and antennas for both cellular telephony and Wi-Fi connectivity, as well as a USB connector for connecting to external devices.

101. SEC Accused Mobile Devices have pre-installed software, including an operating system and applications for controlling the SEC Accused Mobile Devices and for providing a user interface. For example, the Galaxy S7's Camera application has a user interface that includes various icons and symbols corresponding to different camera functions.

102. SEC Accused Mobile Devices include software for voice recognition and voice commands that allows a user to interact with the SEC Accused Mobile Devices using only speech. For example, the Galaxy S7 includes the S-Voice feature for voice

commands. When a user provides a voice command, the Galaxy S7 will respond in a spoken voice.

103. SEC Accused Mobile Devices provide spoken instructions that help a user perform various tasks. For example, the Galaxy S7 comes pre-installed with Google Maps, which provides voice-guided navigation to get from one location to another.

104. SEC Accused Mobile Devices have a program, such as the Camera application, that can convert captured color images into digital image data, and storing the digital image data in a JPG file. The JPG file has a header and tags that identify certain types of data related to the image data.

105. For example, the Galaxy S7 stores JPG files that comply with the Exif 2.2 specification, which requires files to have a header and tags. Certain tags, such as the Color Space tag, are required. The Color Space tag indicates which color space an image is in, and how to convert from the image's color space to the Galaxy S7's display color space.

106. SEC infringes claim 1 of the '288 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

107. SEC has had knowledge of the '288 Patent, and knowledge of RAH Color Technologies' specific allegations of how SEC Accused Mobile Devices infringe claim 1 of the '288 Patent since at least September 28, 2016.

108. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT X: INFRINGEMENT OF U.S. PATENT '288 CLAIM 2

109. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33, 36, and 93-108 of this Complaint as though set forth in full herein.

110. Claim 2 of the '288 patent provides:

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| Claim 2 | The apparatus according to claim 1 wherein said location information comprises at least GPS coordinates. |
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111. SEC Accused Mobile Devices store location information as GPS coordinates.

112. SEC infringes claim 2 of the '288 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

113. SEC has had knowledge of the '288 Patent since at least September 28, 2016.

114. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT XI: INFRINGEMENT OF U.S. PATENT '288 CLAIM 3

115. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33, 36, and 93-108 of this Complaint as though set forth in full herein.

116. Claim 3 of the '288 patent provides:

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| Claim 3 | The apparatus according to claim 1 wherein said color display comprises an array of pixels that are not visually resolvable without the aid of a magnifier. |
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117. SEC Accused Mobile Devices have a color display with individual pixel sizes that cannot be seen with the naked eye, and require magnification to resolve.

118. For example, the Galaxy S7 has a display resolution of 2560 x 1440 pixels, resulting in a pixel density of about 577 pixels per inch. At this density, individual pixels cannot be seen with the naked eye.

119. SEC infringes claim 3 of the '288 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

120. SEC has had knowledge of the '288 Patent since at least September 28, 2016.

121. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT XII: INFRINGEMENT OF U.S. PATENT '288 CLAIM 17

122. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33, 36, and 93-108 of this Complaint as though set forth in full herein.

123. Claim 17 of the '288 patent provides:

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| Claim 17 | The apparatus according to claim 1 wherein said software further comprises a program that operates at least one of said one or more sensors comprising a camera to enable a video conference with another system in which images of at least one |
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| | conversant are displayed on said color display. |
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124. SEC Accused Mobile Devices include a program that allows for video calls with another person using one of the cameras, and can display one or both video call participants on the screen.

125. SEC infringes claim 17 of the '288 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

126. SEC has had knowledge of the '288 Patent since at least September 28, 2016.

127. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT XIII: INFRINGEMENT OF U.S. PATENT '288 CLAIM 19

128. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33, 36, and 93-108 of this Complaint as though set forth in full herein.

129. Claim 19 of the '288 Patent provides:

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| Claim 19 | The apparatus according to claim 1 wherein said software further comprises a program that communicates with an external computer that provides one or both of data or computation to assist in said guiding of user performance. |
|----------|--|

130. SEC Accused Mobile Devices include software programs, such as a navigation program, that communicates with external computers to provide directions.

131. For example, the Galaxy S7 includes Google Maps, which communicates with Google Map servers to provide routes and directions for a user to follow.

132. SEC infringes claim 19 of the '288 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Mobile Devices.

133. SEC has had knowledge of the '288 Patent since at least September 28, 2016.

134. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT XIV: INFRINGEMENT OF U.S. PATENT '340 CLAIM 15

135. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33 of this Complaint as though set forth in full herein.

136. Claim 15 of the '340 Patent provides:

| | |
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| Claim 15 Preamble | A color rendering device comprising: |
| Element A | a plurality of color channels employed in rendering upon a surface in which errors in reproduction of brightness and color are due partly to spatial non-uniformity in the balance between said color channels in rendering a spatially uniform digital image; and |
| Element B | a controller which drives each of said color channels in accordance with a color mixing transformation and which corrects said errors in reproduction of brightness and color that are due to said spatial non-uniformity of rendering responsive to one or more spatial non-uniformity correction tables for each of said color channels, wherein said one or more spatial non-uniformity correction tables are prepared with the aid of an |

| | |
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| | image capture device that is calibrated for approximately colorimetric and uniform spatial response and that is used to measure rendered output of said device. |
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137. “SEC Accused Color Displays” include the UD46E-C Video Display, as well as other hardware and/or software that include the same or equivalent functionality described in paragraphs 138-143 of Count XIV, paragraph 148 of Count XV, and paragraph 154 of Count XVI.

138. SEC Accused Color Displays are color rendering devices that render color images and video in red, green, and blue color channels.

139. In general, every display exhibits some degree of non-uniform reproduction of colors (including whites and grays) and brightness that results in some portions of the display having different colors or brightness than another adjacent portion of the display.

140. SEC Accused Color Displays include the Samsung Advanced Color Management (“ACM”) internal chipset, which acts as a controller to drive the rendering of color images and videos. The ACM chipset includes a 12-bit lookup table (“LUT”) that is used for calculating white balance and color, upon information and belief.

141. Upon information and belief, the ACM chipset uses its internal LUT when correcting errors in color reproduction including those resulting from spatially non-uniform rendering measured during the calibration process.

142. Upon information and belief, the calibration process involves measuring colors and brightness at various points on the SEC Accused Color Displays, and using those measured values to generate correction tables for each color channel to compensate for spatial non-uniformity. The calibration process uses an image capture device, such as

a colorimetrically calibrated camera, to provide the measurements when calibrated at the factory.

143. SEC infringes claim 15 of the '340 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Color Displays.

144. SEC has had knowledge of the '340 Patent since at least February 10, 2016, and knowledge of RAH Color Technologies' specific allegations of how the SEC Accused Color Displays infringe claim 15 of the '340 Patent since at least April 26, 2016.

145. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT XV: INFRINGEMENT OF U.S. PATENT '340 CLAIM 17

146. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33 and 135-145 of this Complaint as though set forth in full herein.

147. Claim 17 of the '340 Patent provides:

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| Claim 17 | The output device according to claim 15 wherein said controller comprises electronics within said device. |
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148. SEC Accused Color Displays include the ACM chipset, which is internally located.

149. SEC infringes claim 17 of the '340 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Color Displays.

150. SEC has had knowledge of the '340 Patent since at least February 10, 2016, and knowledge of RAH Color Technologies' specific allegations of how the SEC Accused Color Displays infringe claim 17 of the '340 Patent since at least April 26, 2016.

151. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT XVI: INFRINGEMENT OF U.S. PATENT '340 CLAIM 18

152. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33 and 135-151 of this Complaint as though set forth in full herein.

153. Claim 18 of the '340 Patent provides:

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| Claim 18 | The output device according to claim 17 wherein said controller corrects said rendering to be uniform in brightness and color within a tolerance across said display surface. |
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154. SEC Accused Color Displays are calibrated such that the ACM chipset corrects color rendering within a 300K error range for color uniformity. Upon information and belief, brightness uniformity will also be corrected within a tolerance range.

155. SEC infringes claim 18 of the '340 Patent when it makes, imports, uses, sells and offers for sale the SEC Accused Color Displays.

156. SEC has had knowledge of the '340 Patent since at least February 10, 2016, and knowledge of RAH Color Technologies' specific allegations of how the SEC Accused Color Displays infringe claim 18 of the '340 Patent since at least April 26, 2016.

157. As a direct and proximate result of SEC’s acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

COUNT XVII: INFRINGEMENT OF U.S. PATENT ’546 CLAIM 26

158. RAH Color Technologies incorporates by reference the allegations set forth in paragraphs 1-33 of this Complaint as though set forth in full herein.

159. Claim 26 of the ’546 Patent provides:

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| Claim 26 Preamble | A method of color image processing comprising the steps of: |
| Element A | capturing an image with a color input device; |
| Element B | processing said image digitally to produce image data in coordinates of a color space, wherein said processing modifies at least one of tone reproduction or chroma; and |
| Element C | storing said image data in a file having a header for obtaining information related to said processing, wherein said information is used in transforming colors for reproduction, wherein said transforming expands the gamut of colors in at least one dimension of said color space. |

160. “SEC Accused Digital Camera Systems” include digital cameras that are compliant with the Exif specification and that have color processing settings (e.g., controlling color tone and white balance), such as the Samsung NX1 digital camera, and other hardware and software that include the same or equivalent functionality described in paragraphs 161-178 of Count XVII.

161. SEC Accused Digital Camera Systems capture a color image using an image sensor.

162. SEC Accused Digital Camera Systems process the captured image using an image processor to produce a digital photograph. The digital photograph has colors that are defined by a color space, such as sRGB or Adobe RGB.

163. Digital cameras capture light (and its color information) using a photosensor (e.g., CMOS). The photosensor, in combination with a processor, converts the captured light into electronic pixel data representative of the light that struck each element of the photosensor. The electronic pixel data is converted into color coordinates for the camera's color space.

164. SEC Accused Digital Camera Systems process images in accordance with color processing settings.

165. For example, the NX1 includes Picture Wizard settings such as Vivid, which increases the saturation of colors in the digital photograph.

166. SEC Accused Digital Camera Systems store the image data as JPEG files compliant with the Exif 2.3 specification at least temporarily on a memory buffer, as well as on a memory card.

167. As an example, the Exif 2.3 specification requires a JPEG to be written in a file that has a header.

168. The header includes information related to color processing settings used, such as the Picture Wizard setting used by the NX1.

169. SEC Accused Digital Camera Systems use the information on color processing settings at the time of processing to transform colors.

170. For example, the Picture Wizard information corresponds to color modifications used when processing the captured image to a color space.

171. SEC Accused Digital Camera Systems use a color transformation that expands the gamut of colors in at least one dimension of the color space.

172. For example, the NX1's Vivid setting increases the saturation of colors in a digital photograph. This increase in saturation expands the gamut of colors of the original image in at least one dimension of a color space.

173. SEC directly infringes claim 26 of the '546 Patent by using the SEC Accused Digital Camera Systems, including at least in relation to product testing and quality control.

174. In addition, SEC induces infringement of claim 26 of the '546 Patent by end users by importing and selling the SEC Accused Digital Camera Systems that practice the claimed process in ordinary use.

175. Upon information and belief, SEC's customers and/or end users have directly infringed and are directly infringing each and every claim limitation of at least claim 26 of the '546 Patent. SEC actively induces customers and end-users to directly infringe each and every claim limitation of at least claim 26 of the '546 Patent under 35 U.S.C. § 271(b). SEC has had actual knowledge of the '546 Patent since at least February 10, 2016. SEC has been and is knowingly inducing its customers and/or end users to directly infringe at least claim 26 of the '546 Patent with the specific intent to encourage such infringement, and knowing that the acts induced constitute patent infringement. SEC's inducement includes, for example, providing extensive training and technical guides, product data sheets, software and hardware specifications, and other forms of support that induce its customers and/or end users to directly infringe at least claim 26 of the '546 Patent by using the SEC Accused Digital Camera Systems.

176. SEC has had knowledge of the '546 Patent since at least February 10, 2016, and knowledge of RAH Color Technologies' specific allegations of how SEC Accused Digital Camera Systems infringe claim 26 of the '546 Patent since at least April 26, 2016.

177. SEC makes, uses, offers to sell, sells, and/or imports the SEC Accused Digital Camera Systems knowing that SEC has infringed and continues to infringe at least claim 26 of the '546 Patent under 35 U.S.C. § 271(a) directly.

178. As a direct and proximate result of SEC's acts of patent infringement, RAH Color Technologies has been and continues to be injured and has sustained, and will continue to sustain, damages.

WILLFUL INFRINGEMENT

179. SEC has infringed and continues to infringe the above identified claims of each of the Patents-in-Suit despite its knowledge of the '546 and '340 Patents since at least February 10, 2016; its knowledge of the '236 Patent since at least April 26, 2016; its specific knowledge of RAH Color Technologies' allegations for the '236, '546, and '340 Patents since at least April 26, 2016; its specific knowledge of RAH Color Technologies' allegations for the '802 and '288 Patents since at least September 28, 2016; and the objectively high likelihood that its acts constitute patent infringement.

180. SEC's infringement of the Patents-in-Suit is willful and deliberate, entitling RAH Color Technologies to enhanced damages under 35 U.S.C. § 284.

181. SEC's willful infringement and unwillingness to enter into license negotiations with RAH Color Technologies make this an exceptional case such that RAH

Color Technologies should be entitled to recover its attorneys' fees and costs incurred in relation to this matter pursuant to 35 U.S.C. § 285.

JURY DEMAND

RAH Color Technologies demands a trial by jury on all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff RAH Color Technologies requests that this Court enter judgment in its favor and against SEC as follows:

A. Adjudging, finding, and declaring that SEC has infringed of the above-identified claims of each of the Patents-in-Suit under 35 U.S.C. § 271;

B. Awarding the past and future damages arising out of SEC's infringement of the Patents-in-Suit to RAH Color Technologies in an amount no less than a reasonable royalty, together with prejudgment and post-judgment interest, in an amount according to proof;

C. Adjudging, finding, and declaring that SEC's infringement is willful and enhanced damages and fees as a result of that willfulness under 35 U.S.C. § 284;

D. Adjudging, finding, and declaring that this is an "exceptional" case pursuant to 35 U.S.C. § 285;

E. Awarding attorney's fees, costs, or other damages pursuant to 35 U.S.C. §§ 284 or 285 or as otherwise permitted by law; and

F. Granting RAH Color Technologies such other further relief as is just and proper, or as the Court deems appropriate.

July 25, 2017

Respectfully submitted,

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