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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

WESTERN DIVISION

CORE OPTICAL TECHNOLOGIES, LLC,

Plaintiff,

v.

CISCO SYSTEMS, INC., and DOES 1 through 10, inclusive,

Defendants.

CASE NO: 8:20-cv-01468-JAK-RAO

SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT

JURY TRIAL DEMANDED

Plaintiff Core Optical Technologies, LLC ("Plaintiff" or "Core"), by and through its undersigned counsel, hereby files this Second Amended Complaint for Patent Infringement against Defendants Cisco Systems, Inc. ("Cisco") and Does 1 through 10, inclusive ("Does") (collectively, "Defendants").

For its complaint, Core alleges as follows:

THE PARTIES

1. Core is a limited liability company organized and existing under the laws of the State of California. Core has a principal place of business located at 18792 Via Palatino, Irvine, California 92603.

2. Defendant Cisco is a corporation organized and existing under the laws of California. Cisco maintains its principal place of business at 170 West Tasman Dr., San Jose, California 95134.

3. Defendants Does are: (i) customers and/or end-users of Cisco's fiber optic cross polarization interference cancelling devices; (ii) other end-users of Cisco's fiber optic cross polarization interference cancelling devices; (iii) persons, such as third-party vendors or contractors, who have assisted Cisco or the Doe Defendants in using Cisco's fiber optic cross polarization interference cancelling devices in a manner that infringes the Asserted Claims (as defined below); and/or (iv) other persons, all of whom have infringed the Asserted Claims, or who have assisted other Defendants in infringing the Asserted Claims, by or through their use of Cisco's fiber optic cross polarization interference cancelling devices.

4. The true names and identities of the Doe Defendants are unknown at this time. Therefore, they are being sued under their fictitious names. At such time as their true names are ascertained, this Complaint will be amended to so reflect.

5. On information and belief, each Doe Defendant has directly and/or indirectly infringed the Asserted Claims, either by themselves or in concert with other Defendants, by using Cisco's fiber optic cross polarization interference cancelling devices in the United States. Core reserves the right to amend this Complaint to identify the specific infringing acts of each Doe Defendant once it learns such facts. Core expect that most, or all, of such facts are non-public. Core expects to uncover such facts in discovery.

JURISDICTION AND VENUE

6. This is an action for infringement of method claims, and *only* method claims, of U.S. Patent No. 6,782,211, entitled "Cross Polarization Interface [sic] Canceler," which was duly issued by the United States Patent and Trademark Office on August 24, 2004 ("the '211 patent"). The asserted claims in this case are *only* method claims 30, 32, 33, 35 and 37 of the '211 patent ("the Asserted Claims").

7. This Court has subject matter jurisdiction over this case under 28 U.S.C. §§ 1331 and 1338(a), because the claims arise under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq*.

8. This Court has general personal jurisdiction over each Defendant, because—on information and belief—each Defendant conducts continuous and systematic business in California, including, upon information and belief, in this judicial district. This Court also has general personal jurisdiction over each Defendant, because—on information and belief—each Defendant maintains a regular and established place of business in this district.

9. This Court has general personal jurisdiction over Defendant Cisco because it maintains regular and established places of business in California, including its headquarters located at 170 West Tasman Dr., San Jose, California. Because Cisco maintains its headquarters in California, Cisco is resident in California, and it is subject to general personal jurisdiction in the district courts of California. Cisco also maintains regular and established places of business within this judicial district, including its offices located at: (i) 11111 Santa Monica Blvd., Suite 400, Los Angeles, California 90025; (ii) 121 Theory Drive, Suite 100, Irvine, California 92617; and (iii) 130 Theory Drive, Suite 100, Irvine, California 92617.

10. This Court also has general personal jurisdiction over Defendant Cisco because, on information and belief, Cisco conducts continuous and systematic business within California, including within this judicial district.

11. In addition, this Court has specific personal jurisdiction over each Defendant because, on information and belief, each Defendant has committed acts of

infringement in California, and within this judicial district.

12. This Court has specific personal jurisdiction over Defendant Cisco because, on information and belief, it has committed acts that infringe the Asserted Claims in California, and in this judicial district. More specifically, on information and belief, Cisco has performed all of the steps of the Asserted Claims in California, and in this judicial district, either personally, through intermediaries, or in conjunction with one or more joint venturers or customers. Furthermore, on information and belief, Cisco has induced and/or contributed to customers' infringement of the Asserted Claims in California, and in this judicial district.

13. Venue is proper in this judicial district against each Defendant.

14. Venue is proper against Defendant Cisco because, on information and belief: (i) Cisco has regular and established places of business in this judicial district, including the places of business identified in Paragraph 9 *supra*; and (ii) Cisco has committed acts of infringement in this judicial district, including by: (a) performing all of the steps of the method(s) claimed in the '211 Patent in this judicial district (alone or in conjunction with one or more joint venturers, contractors or customers); and/or by (b) performing acts of contributory or induced infringement in this judicial district. *See* 28 U.S.C. § 1400(b). In particular, as to (b), on information and belief, Cisco has contributed to and/or induced infringement in this district by selling accused Fiber Optic XPIC Devices to customers in this judicial district, by providing instructions to such customers on how to use the Fiber Optic XPIC Devices in an infringing manner, and by actively assisting such customers in using the Fiber Optic XPIC Devices within this district (including through the provision of installation, support, maintenance, and other services to such customers in this district).

15. In addition, venue is proper because Core resides in this judicial district, and Core has and continues to suffer harm in this judicial district. Moreover, a substantial part of the events giving rise to this action occurred in this judicial district, including the inventive activities giving rise to the '211 patent.

THE ASSERTED PATENT

16. Mark Core, the sole named inventor of the '211 patent, earned his Ph.D. in electrical and computer engineering from the University of California, Irvine, and is the Manager of Core Optical Technologies, LLC. The pioneering technology set forth in the '211 patent greatly increases data transmission rates in fiber optic networks, by enabling two optical signals transmitted in the same frequency band, but at generally orthogonal polarizations, to be recovered at a receiver. The patented technology that enables the recovery of these signals includes coherent optical receivers and related methods that mitigate cross-polarization interference associated with the transmission of the signals through the fiber optic network. The coherent receivers and their patented methods mitigate the effects of polarization dependent loss and dispersion effects that limit the performance of optical networks, greatly increasing the transmission distance and eliminating or reducing the need for a variety of conventional network equipment such as amplifiers, regenerators, and compensators. The patented technology set forth in the '211 patent has been adopted by Defendants in, at least, their packet-optical transport solutions described below.

17. On November 5, 1998, Mark Core filed with the United States Patent and Trademark Office ("USPTO") Provisional Patent Application No. 60/107,123 ("the '123 application") directed to his pioneering inventions. On November 4, 1999, Mark Core filed with the USPTO a non-provisional patent application, U.S. Patent Application No. 09/434,213 ("the '213 application"), claiming priority to the '123 application. On August 24, 2004, the USPTO issued the '211 patent from the '213 application. The entire right, title, and interest in and to the '211 patent, including all rights to past damages, has been assigned to Core in an assignment recorded with the USPTO. The '211 patent is attached as Exhibit 1 to this Complaint.

18. The Asserted Claims of the '211 patent are all method claims. One of these is claim 33, an independent method claim. Claim 33 is reproduced below, with parenthetical annotations to identify the different elements of the claim:

33. A method comprising:

(33a) receiving an optical signal over a single fiber optic transmission medium,

(33a1) the optical signal being at least two polarized field components independently modulated with independent information bearing waveforms; and

(33b) mitigating cross polarization interference associated with the at least two modulated polarized field components to reconstruct the information bearing waveforms

(33b1) using a plurality of matrix coefficients being complex values to apply both amplitude scaling and phase shifting to the at least two modulated polarized field components.

DEFENDANTS' CROSS POLARIZATION CANCELLING DEVICES

19. Defendants and/or their divisions, subsidiaries, and/or agents are engaged in the business of making, using, distributing, importing, offering for sale and/or selling devices that can be configured to mitigate and/or cancel cross polarization interference in received fiber optic signals. As so configured, the devices, when used, perform all the steps of the methods claimed in the Asserted Claims, during normal use. These devices include, but are not limited to: (i) the Network Convergence System 1000 Series Platform ("NCS 1000"), the NCS 2000 Series Platform ("NCS 2000"), the NCS 4000 Series Platform ("NCS 4000"), the NCS 5500 Series Platform ("NCS 5500"), the ASR 9000 Series Platform ("ASR 9000"), the ONS 15454 Series Platform ("ONS 15454"), and the CRS-1, CRS-3 and CRS-X Platforms ("CRS") (collectively, the "Platforms"); (ii) the Cisco modules, line cards, transponders, muxponders, pluggable optical modules, and other equipment that is used with the Platforms to perform optical communication with polarization-division

multiplexing ("PDM") and cross-polarization interference cancelling ("XPIC") (the "Modules"); and (iii) the software and firmware used to control and operate the Platforms and the Modules to perform optical communication with PDM and XPIC, including Cisco Transport Controller ("CTC") and IOS-XR software (the "Software") (collectively, "the Fiber Optic XPIC Devices" or the "Accused Instrumentalities").

20. The Modules include, but are not limited to, the following line cards and modules that are used with the Platforms to perform infringing dual-polarization communication: (i) NCS 1002; (ii) NCS1K4 12x QSFP28 2 Trunk C-Band DWDM card; (iii) NCS1K4-1.2T-K9; (iv) NCS1K4-1.2T-L-K9; (v) NCS 2000 100-Gbps Coherent DWDM Trunk Card with CPAK Client Interface; (vi) NCS2K-100G-CK-C; (vii) NCS2K-100ME-CKC; (viii) ONS 15454 100-Gbps CP-DQPSK Full C-Band Tunable DWDM Trunk Card; (ix) 15454-M-100G-LC-C; (x) 15454-M-100G-ME-C; (xi) 15454-M-100GC-LIC; (xii) NCS 2000 200-Gbps Coherent DWDM Trunk Card with CPAK Client Interface; (xiii) NCS 2000 200-Gbps Multirate DWDM Line Card; (xiv) NCS2K-200G-CK-C; (xv) NCS2K-200G-CK-LIC; (xvi) NCS 2000 400 Gbps XPonder Line Card; (xvii) NCS2K-400G-XP; (xviii) NCS2K-400GXP-L-K9; (xix) NCS2K-400GXP-SK; (xx) NCS2K-10X200XP-SK; (xxi) NCS2K-10XMXP-SK; (xxii) 100G QPSK/200G 16-QAM - WDM CFP2 Pluggable; (xxiii) ONS-CFP2-WDM; (xxiv) ONS-CFP2-WDM-1KL; (xxv) ONS-CFP2-WDM-1KE; (xxvi) NCS 4000 400 Gbps DWDM /OTN/Packet Universal Line Card; (xxvii) NCS4K-4H-OPW-QC2; (xxviii) NCS 4000 2x100G CP-DQPSK – Full C Band Tunable Line Card; (xxix) NCS4K-2H-W; (xxx) 1.2-Tbps IPoDWDM Modular Line Card Data Sheet; (xxxi) NC55-6X200-DWDM-S; (xxxii) NC55-6X2H-DWDM-BM; (xxxiii) ONS 15454 40 Gbps CP-DQPSK Full C-Band Tunable Transponder Card; (xxxiv) 15454-40E-TXP-C; (xxxv) 15454-40EX-TXP-C; (xxxvi) 15454-40ME-TXP-C; (xxxvii) ONS 15454 100-Gbps CP-DQPSK Full C-Band Tunable DWDM Trunk Card; (xxxviii) 15454-M-100G-LC-C; (xxxix) 15454-M-100G-ME-C; (xl) 15454-M-100GC-LIC; (xli) ASR 9000 400-Gbps IPoDWDM Line Card; (xlii) A9K-400G-

DWDM-TR; (xliii) Cisco CRS 1-Port 100 Gigabit Ethernet Coherent DWDM Interface Module; (xliv) 1-100GE-DWDM/C; (xlv) CO100TDL; (xlvi) CO200TDL; (xlvii) CO400TDL; (xlviii) NCS4K-4H-OPW-LO; and (xlix) any other Cisco line card, transponder, muxponder, pluggable optical module, or other such equipment that is used with the Platforms to perform dual-polarization communication.

21. Each Fiber Optic XPIC Device is, or can be, configured to perform all of the steps recited in the Asserted Claims of the '211 Patent, during normal use. On information and belief, each Defendant has actually used the Fiber Optic XPIC Devices to perform each step of the methods recited in the Asserted Claims of the '211 Patent, within the United States, either itself, through intermediaries, or in conjunction with one or more joint venturers or customers.

22. Cisco's product literature, website, and other publicly-available information shows that the Fiber Optic XPIC Devices, when used with appropriate components, are configured to perform all of the steps of claim 33, during normal use.

23. Element 33(a) recites "receiving an optical signal over a single fiber optic transmission medium." The Fiber Optic XPIC Devices are configured to do this, during normal operation.

24. For instance, a datasheet for the NCS 4000 Series Platform (Exhibit 2) states that the NCS 4000 is a "converged ***optical*** service platform providing Dense Wavelength-Division Multiplexing (DWDM), Optical Transport Network (OTN), Multiprotocol Label Switching (MPLS), Carrier Ethernet, and Label Switch Router (LSR) or IP multiservice capabilities." Ex. 2 at 1. Thus, the NCS 4000 Platform sends and receives "optical" signals. The same is true of the other Platforms. *See, e.g.,* Exhibit 3 (NCS 2000 Series Datasheet) at 2 (stating that the NCS 2000 can be used to "creat[e] a unified ***packet optical*** transport system encompassing DWDM plus OTN and packet switching"); Exhibit 4 (NCS 1002 Datasheet) at 1 (stating that the NCS 1002 provides "maximum ***optical*** performance" with "DWDM" transport capability); Exhibit 5 (NCS 1004 Datasheet) at 5 (stating that the NCS 1004 provides

"performance monitoring of ***optical*** parameters on the client and DWDM line interface including laser bias current, transmit ***and receive optical*** power"); Exhibit 6 (ONS 15454 M2 Datasheet) at 3 (stating that the ONS 15454 MSTP is an "***optical*** transport platform"); Ex. 16 (NCS 5500 Series Datasheet) at 3-4 (NCS 5500 is an "optic[al]" system which "offers industry-leading density of routed 100 Gigabit Ethernet (100GE) ports for high-scale WAN aggregation"); Ex. 17 (NCS 9000 Series Datasheet) at 5 (stating that the NCS 9000 provides "IP over Dense Wavelength-Division Multiplexing (IPoDWDM)" optical communication); Ex. 18 (CRS 16-slot Datasheet) at 1-2 (stating that the CRS is an "optical" system).

25. The Fiber Optic XPIC Devices, in operation, are configured to receive optical signals over a "fiber optic transmission medium." *See, e.g.,* Ex. 2 at 1 (stating that the NCS 4000 has "16 service line-card slots," each of which accepts a "line card" that receives optical signals over fiber optic cables); Ex. 3 at 2 (stating that the NCS 2000 has multiple "slots for service cards," each of which receives optical signals over fiber optic cables); Ex. 4 at 1 (stating that the NCS 1002 has "8 CFP-2ACO based DWDM trunk ports," each of which receives optical signals over fiber optic cables); Ex. 5 at 1 (stating that the NCS 1004 has "four line card slots," each of which accepts a "line card" that receives optical signals over fiber optic cables); Ex. 6 at 1 (stating that the ONS 15454 M2 has "two slots for service cards," each of which accepts a "line card" that receives optical signals over fiber optic cables); Ex. 16 at 3-4 (NCS 5500 is an optical system, using fiberoptic cables); Ex. 17 at 5 (same for NCS 9000); Ex. 18 at 1-2 (same for CRS).

26. Thus, when properly configured and used, the Fiber Optic XPIC Devices "receiv[e] an optical signal over a single fiber optic transmission medium" during normal operation, as recited in element 33(a).

27. Element 33(a1) recites "the optical signal being at least two polarized field components independently modulated with independent information bearing waveforms." Publicly-available evidence shows that the Fiber Optic XPIC Devices,

when appropriately configured, perform this step during normal operation.

28. The transmission or reception of optical signals with "at least two polarized field components independently modulated with independent information bearing waveforms" is called "Polarization-Division Multiplexed" ("PDM") optical communication. Public evidence shows that the Fiber Optic XPIC Devices, when appropriately configured, perform PDM optical communication during normal use.

29. For instance, the NCS 4000 datasheet states that the NCS 4000 provides "DWDM [i.e., Dense Wavelength-Division Multiplexing] functions," including "100 Gbps ***CP-DQPSK*** … WDM interfaces." Ex. 2 at 12 (emphasis added). Cisco uses the term "CP-DQPSK" to mean "coherent ***polarization-multiplexing*** differential quadrature phase shift keying (CP-DQPSK) modulation." Ex. 7 (ONS 15454 100-Gbps CP-DQPSK Full C-Band Tunable DWDM Card datasheet) at 1 (emphasis added). Thus, when used with appropriate components, and configured properly, the NCS 4000 Platforms use PDM optical communication, as recited in element 33(a1).

30. Similarly, the NCS 2000 includes multiple slots for "service cards." Ex. 3 at 2. Several of the service cards used with the NCS 2000 use PDM communication. These include: (i) the NCS 2000 100-Gbps Coherent DWDM Trunk Card with CPAK Client Interface, which uses "CP-DQPSK modulation" (Ex. 8 (100-Gbps Trunk Card Datasheet) at 1); (ii) the NCS 2000 200-Gbps Multirate DWDM Line Card, which uses three different types of "coherent polarization-multiplexed" modulation (Ex. 9 (200-Gbps Multirate Line Card Datasheet) at 1); (iii) the NCS 2000 400 Gbps XPonder Line Card, which uses three different types of "CP"—i.e., coherent PDM—modulation (Ex. 10 (400 Gbps Xponder Line Card datasheet) at 12); and (iv) the ONS 15454 100Gbps Trunk Card, which is compatible with the NCS 2000 Series (*see* Ex. 7 at 11), and which uses "coherent polarization-multiplexing differential quadrature phase shift keying (CP-DQPSK) modulation." *Id.* at 1. Thus, when used with appropriate components, and configured properly, the NCS 2000 Platforms use PDM optical communication, as recited in element 33(a1), during normal use.

31. Similarly, the NCS 1000 Series uses PDM optical communication. *See* Ex. 4 at 1 (stating that the NCS 1002 uses three different types of "coherent polarization-multiplexed" modulation); Ex. 5 at 8 (stating that the NCS 1004 uses various types of "PM" – i.e., polarization multiplexed – communication). Thus, when used with appropriate components, and configured properly, the NCS 1000 Platforms use PDM optical communication, as recited in element 33(a1), during normal use.

32. The ONS 15454 Platforms are also used with Modules that perform dual-polarization communication. *See, e.g.,* Ex. 7 at 1 (stating that the "ONS 15454 Multiservice Transport Platform (MSTP) supports" the "100Gbps ***CP-DQPSK*** Full C-Band Tunable DWDM Trunk Card").

33. The NCS 5500 Platforms are also used with Modules that perform dual-polarization communication. *See, e.g.,* Ex. 19 (NCS 5500 1.2-Tbps IPoDWDM Modular Line Card Datasheet) at 1-2 (stating that the NCS 5500 is compatible with the "NC55-6X200-DWDM-S" line card, which uses "coherent polarization-multiplexed" optical communication).

34. The ASR 9000 Platforms are also used with Modules that perform dual-polarization communication. *See, e.g.,* Ex. 20 (ASR 9000 400-Gbps IPoDWDM Line Card Datasheet) at 1-2 (stating that the ASR 9000 is compatible with the "ASR 9000 400-Gbps IPoDWDM Line Card," which "features 100-Gbps ***coherent polarization-multiplexed*** different quadrature phase shift keying (CP-DQPSK).")

35. The CRS Platforms are also used with Modules that perform dual-polarization communication. *See, e.g.,* Ex. 21 (CRS 1-Port 100 Gigabit DWDM Interface Module Datasheet) at 1 (indicating that the CRS Platforms are compatible with the 100Gg DWDM module, which uses "***CP***-DQPSK" modulation).

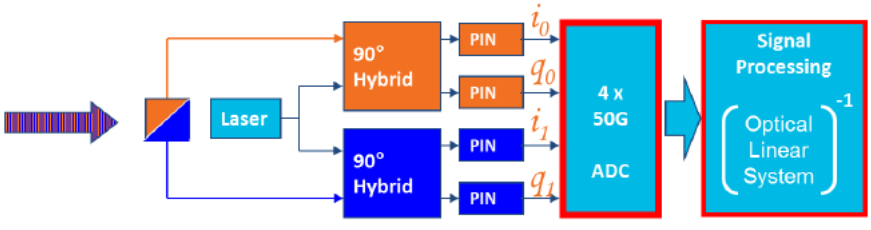
36. Paragraphs 29-35 *supra* merely provide a representative sample of some of the Modules that can be used with the Platforms to perform dual-polarization communication. Other Modules, including the Modules listed in Paragraph 20 *supra*, can also be used with one or more of the Platforms to perform dual-polarization

communication. Whenever a Module is used with a Platform to perform dual-polarization communication, the assembly receives an "optical signal being at least two polarized field components independently modulated with independent information bearing waveforms," as recited in element 33(a1),

37. Accordingly, when used with appropriate components and configured properly, the Fiber Optic XPIC Devices receive an "optical signal being at least two polarized field components independently modulated with independent information bearing waveforms," as recited in element 33(a1), during normal use.

38. Element 33(b) recites "mitigating cross polarization interference associated with the at least two modulated polarized field components to reconstruct the information bearing waveforms." Publicly-available evidence shows that the Fiber Optic XPIC Devices, when configured properly and used with appropriate components, perform this step during normal use.

39. For instance, the 2013 Cisco Presentation "Optical Transport (DWDM) Evolution and Developments" (Ex. 11) describes Cisco's "CP-DQPSK" modulation techniques – i.e., the techniques used in the Fiber Optic XPIC Devices to perform PDM optical communication. *See* Ex. 11 at 28-32. The presentation states that the Fiber Optic XPIC Devices have coherent optical receivers that perform "[a]dvanced signal processing to address: CD [chromatic dispersion] compensation; PMD [polarization mode dispersion] mitigation; [and] Single Channel Non-linear impairment mitigation." *Id.* at 28. The Presentation shows the structure of the coherent optical receivers in the Fiber Optic XPIC Devices as follows (*id.* at 29):

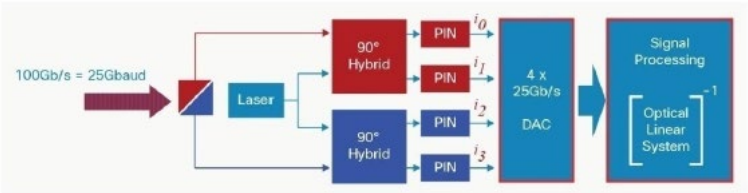


40. As seen above, the coherent optical receivers in the Fiber Optic XPIC Devices split received optical signals into two orthogonal polarizations; pass each to a

90 degree hybrid mixer; mix the received signal components with the components of a local oscillator ("Laser") reference signal; detect the in-phase and quadrature components of the received optical signal at the two orthogonal polarizations (i.e., i_0, q_o, i_1, q_1); pass the detected signals to four Analog-to-Digital Converters (ADCs); and then perform "Signal Processing" on the detected signals. The signal processing includes "[c]alculat[ing] the Inverse Optical System Matrix" of the transmission path, to "Recover[the] Polarisation" of the transmitted signal. Ex. 11 at 29. This process of calculating the inverse of the optical system matrix, to recover the polarization of the transmitted signal, comprises "mitigating cross polarization interference associated with the at least two modulated polarized field components to reconstruct the information bearing waveforms," as recited in element 33(b).

41. Similarly, the Datasheet for the ONS 15454 100G Trunk Card shows that that card uses the same coherent optical receiver structure shown in the presentation:

Figure 5. CP-DQPSK Logical Receiver Scheme



Ex. 7 at 4. This confirms that the coherent optical receivers in the Fiber Optic XPIC Devices are configured to satisfy element 33(b) in normal operation.

42. On information and belief, including information that has been produced in discovery by Cisco and by Cisco's supplier and now-subsidiary Acacia Communications, Inc. ("Acacia"), each of the Modules mitigates cross-polarization interference by way of a structure and/or process that is similar to, identical to, or equivalent to the structures and processes shown in Paragraphs 39-41 *supra*.

43. Thus, the evidence shows that the Fiber Optic XPIC Devices, when appropriately configured and used with the appropriate components, are configured to satisfy element 33(b), during normal use.

44. Element 33(b1) recites "using a plurality of matrix coefficients being

complex values to apply both amplitude scaling and phase shifting to the at least two modulated polarized field components." Publicly-available evidence shows that the Fiber Optic XPIC Devices, when properly configured and used with appropriate components, perform this step during normal use.

45. As shown in Paragraphs 39-42 *supra*, the evidence shows that the coherent optical receivers in the Fiber Optic XPIC Devices perform "signal processing" that includes "calculat[ing] the ***Inverse Optical System Matrix***," to "Recover[the] Polarisation" of the transmitted signal. Ex. 11 at 29. Thus, the Fiber Optic XPIC Devices apply a "plurality of matrix coefficients" to the "at least two modulated polarized field components," as recited in element 33(b1).

46. Moreover, the matrix coefficients which the Fiber Optic XPIC Devices apply to the "modulated polarized field components" are ***necessarily*** "complex values." In general, when an optical signal propagates along a transmission medium – such as a fiber optic cable – the medium affects both the amplitude and phase of the signal. The cumulative effects of the medium can be expressed in a matrix, which Cisco calls the "Optical System Matrix." *Id.* To fully account for the effects of the medium, the coefficients in this matrix must be ***complex***, such that the real parts of the coefficients account for the amplitude-effects of the medium, and the imaginary parts of the coefficients account for the phase-effects of the medium.

47. Cisco's documents indicate that the Fiber Optic XPIC Devices compute the "inverse" of the "Optical System Matrix," and apply that inverse to the received optical signals to recover the originally-transmitted signals. *Id.* Since the Optical System Matrix must have complex coefficients, the inverse of that Matrix – which is applied to the received signals – must also have complex coefficients. Thus, the Fiber Optic XPIC Devices apply "a plurality of matrix coefficients being complex values" to the received optical signals, as recited in element 33(b1).

48. Finally, the Fiber Optic XPIC Devices "apply both amplitude scaling and phase shifting," as recited in the claim. As discussed above, to fully account for the

effects of the transmission medium, and "Recover [the] Polarisation" of the original signals, the "Inverse Optical System Matrix" must use ***complex*** coefficients. Such coefficients ***necessarily*** perform both "amplitude scaling" and "phase shifting" to the received signal components, as recited in element 33(b1).

49. Accordingly, publicly-available evidence shows that the Fiber Optic XPIC Devices, when configured properly and used with the appropriate components, are configured to perform all of the elements of claim 33, during normal use.

Marking – 35 U.S.C. § 287(a)

50. Core has never made, sold, used, offered to sell, or imported into the United States any article that practices any claim of the '211 Patent. Core has never sold, commercially performed, or offered to commercially perform any service that practices any claim of the '211 Patent.

51. Prior to October 21, 2014, Core had never authorized, licensed, or in any way permitted any third party to practice any claim of the '211 Patent.

52. Moreover, Core alleges that Defendants infringe ***only*** method claims of the '211 patent. Core does not allege that Defendants infringe any apparatus claims of the '211 patent. The marking requirement of 35 U.S.C. § 287(a) does not apply when a patentee only asserts infringement of method claims. *See Crown Packaging Tech., Inc. v. Rexam Beverage Can Co*., 559 F.3d 1308, 1316 (Fed. Cir. 2009); *Hanson v. Alpine Valley Ski Area, Inc*., 718 F.2d 1075, 1082-83 (Fed. Cir. 1983).

53. Because Core has never directly marketed any product or service that practices any of the claimed inventions of the '211 Patent, and no third party was authorized to practice any claimed inventions of the '211 patent prior to October 21, 2014, 35 U.S.C. § 287(a) cannot prevent or otherwise limit Core's entitlement to damages for acts of infringement that occurred prior to October 21, 2014.

54. Because Core alleges that Defendants infringe only method claims of the '211 patent, 35 U.S.C. § 287(a) does not apply, even for acts of infringement that occurred after October 21, 2014. Thus, 35 U.S.C. § 287(a) does not limit Core's

entitlement to damages against Defendants, in any way, for any period of time.

COUNT I – DIRECT PATENT INFRINGEMENT (35 U.S.C § 271(a))

55. Plaintiff repeats and realleges each and every allegation contained in Paragraphs 1-54 above, as if fully set forth herein.

56. Defendants have made, used, offered for sale, and/or sold, directly and/or through intermediaries, in this judicial district and/or elsewhere in the United States, one or more of the Fiber Optic XPIC Devices, and/or imported into the United States one or more of the Fiber Optic XPIC Devices.

57. Defendants' acts complained of herein, including their use of the Fiber Optic XPIC Devices, directly infringes the Asserted Claims, because—as shown in Paragraphs 19-49 *supra* (for claim 33)—the Fiber Optic XPIC Devices are configured to perform all of the steps recited in those claims, during normal use.

58. Defendants have directly infringed the Asserted Claims of the '211 Patent by performing all of the steps of those claims within the U.S., either themselves, through intermediaries, or in conjunction with joint venturers and/or customers. Specifically, on information and belief, Defendants have performed all of the steps recited in each Asserted Claim, either personally, through intermediaries, or in conjunction with joint venturers and/or customers, by operating the Fiber Optic XPIC Devices within the U.S.. Such operation necessarily performs all of the steps recited in those claims, as shown in Paragraphs 19-49 *supra* (for claim 33).

COUNT II - INDUCEMENT OF INFRINGEMENT (35 U.S.C § 271(b))

59. Plaintiff repeats and realleges each and every allegation contained in Paragraphs 1-58 *supra*, as if fully set forth herein.

60. Defendants have actively induced infringement of the Asserted Claims of the '211 Patent, in violation of 35 U.S.C. § 271(b).

61. Defendants have actively induced infringement of these claims by selling the Fiber Optic XPIC Devices to one or more customers in the U.S., along with documentation and instructions demonstrating how to use the devices to infringe the

claims, and/or by providing service, maintenance, support, or other active assistance to their customers in using the Fiber Optic XPIC Devices in the U.S. The documentation which Defendants have provided includes, at least: (i) the product information for the Fiber Optic XPIC Devices set forth on Defendants' websites, including https://www.cisco.com/ , which includes the various white papers, manuals, datasheets, and other technical documentation for the Fiber Optic XPIC Devices provided on Defendants' websites; (ii) the specific instances of Defendants' product documentation which are attached as Exhibits to this Complaint, or which are otherwise referenced in this Complaint; and (iii) the other product documentation which, on information and belief, Defendants provide in electronic and/or paper form to their customers for the Fiber Optic XPIC Devices.

62. For instance, Cisco's website publishes detailed technical support, installation and configuration information for the Fiber Optic XPIC Devices. These include "Configuration Guides," "Install and Upgrade Guides," "Command References," "Technical References," "Data Sheets," and other documents. *See* https://www.cisco.com/c/en/us/support/optical-networking/network-convergence-system-4000-series/tsd-products-support-series-home.html (Support page for the NCS 4000 Series); https://www.cisco.com/c/en/us/support/optical-networking/network-convergence-system-2000-series/tsd-products-support-series-home.html (Support page for the NCS 2000 Series); https://www.cisco.com/c/en/us/support/optical-networking/network-convergence-system-1000-series/tsd-products-support-series-home.html (Support page for the NCS 1000 Series); https://www.cisco.com/c/en/us/support/optical-networking/ons-15454-sonet-multiservice-provisioning-platform-mspp/model.html (Support page for ONS 15454).

63. On information and belief, the foregoing technical documentation on Cisco's website, along with other information Cisco provides to its customers, specifically instructs customers on how to select, install, configure and operate the Fiber Optic XPIC Devices in order to practice the Asserted Claims.

64. On information and belief, Cisco has also provided other product documentation, training, support, advertisement and/or other communications or materials to end-users, apart from the materials specifically referenced in this Complaint, which were intended to induce, and which did induce, end-users to infringe the Asserted Claims. Core expects that many such materials are non-public. Core expects that it will uncover such materials through discovery in this case. Core reserves the right to amend this Complaint to identify such additional materials as they are uncovered through discovery, to the maximum extent permitted by law.

65. For instance, Cisco provides customers for the ONS 15454 Platform with the "Cisco ONS 15454 DWDM Control Card and Node Configuration Guide" (Ex. 22), the "Cisco ONS 15454 Hardware Installation Guide" (Ex. 23), the "Cisco ONS 15454 DWDM Network Configuration Guide" (Ex. 24), the "Cisco ONS 15454 DWDM Line Card Configuration Guide" (Ex. 25), and the manual "Installing the GBIC, SFP, SFP+, QSFP, XFP, CXP, CFP, and CPAK Optical Modules in Cisco ONS Platforms" (Ex. 26). Together, these documents give detailed instructions on how to install, set up, and operate the Fiber Optic XPIC Devices to perform infringing dual-polarization communication.

66. In particular, Exhibit 23 provides detailed instructions on how to install and set up the ONS 15454 Platform chassis themselves. Exhibit 22 provides detailed instructions on how to install, set up and operate the "control cards" used to control the ONS 15454 Platform. Exhibit 25 provides detailed instructions on how to install, set up and operate the "Line Cards"—i.e., Modules—that are used to perform dual-polarization communication. A very large section of Exhibit 25 explicitly describes how to "provision" (i.e., set up and install) the "Transponder and Muxponder Cards" used with ONS 15454 to perform dual-polarization communication. Ex. 25 at 205-799. Among other such cards, this section explains how to install and set up the "40E-TXP-C" card (*Id.* at 234), the "100G-LC-C, 100G-ME-C, 100G-CK-C, 100GS-CK-LC, 100ME-CKC, and 200G-CK-LC Cards" (*id.* at 344-348, 364-369), and the

"400G-XP-LC" card (*id.* at 369), all of which are modules that perform dual-polarization communication. Meanwhile, Exhibit 24 provides detailed instructions on how to set up a network using the cards to perform dual-polarization communication, and Exhibit 25 provides detailed instructions on how to install the pluggable optical modules used with some of the cards to perform dual-polarization communication.

67. Thus, Cisco provides detailed instructions to its customers on how to install, set up, and use Modules with the ONS 15454 Platforms to perform infringing dual-polarization communication.

68. Cisco also provides detailed instructions to its customers on how to install, set up, and use Modules with the other Accused Platforms to perform infringing dual-polarization communication. Such detailed instructions are, on information and belief, similar in scope to the instructions provided for the ONS 15454 Platforms, described above, and evidenced in the attached Exhibits. Cisco's provision of such instructions, along with sales of the Accused Instrumentalities, constitutes acts of inducing its customers to infringe the Asserted Claims.

69. Moreover, on information and belief, including information produced in discovery, Cisco provides direct support to its customers in installing, setting up, and using the Accused Instrumentalities to perform infringing dual-polarization communication. On information and belief, Cisco provides such support either itself, or through contractors subject to its direction and control. Such direct support constitutes further acts by Cisco of inducing its customers to infringe the Asserted Claims. While Core has requested detailed information about Cisco's installation and support activities, to date, Cisco has refused to produce such information. Core reserves the right to amend this Complaint to cite additional information regarding Cisco's installation, support and related activities once it is produced.

70. Further, when Cisco performed the acts of inducement outlined in Paragraphs 61-69 *supra* (and other acts of inducement), it was aware of the '211 patent, and knew (or was willfully blind) that its customers' normal use of the

Accused Instrumentalities would infringe the Asserted Claims of the '211 patent.

71. On October 30, Core served its First Set of Interrogatories upon Cisco in this case. Interrogatory No. 7 asked: "Identify and describe in detail the circumstances by which Cisco became aware of or otherwise obtained knowledge relating to the existence of the '211 patent, as well as any related subsequent action undertaken by Cisco or another person on its behalf, including, but not limited to, all studies, analyses, and examinations of the '211 patent, its scope, or its claims."

72. On February 5, 2020, Cisco for the first time provided a substantive response to Interrogatory No. 7 in its Supplemental Responses, stating: "Cisco became aware of the existence of the '211 patent on or about July 7, 2016 when informed by its customer Fujitsu of the lawsuit brought by Core Optical against Fujitsu."

73. Based on Cisco's Supplemental Response to Interrogatory No. 7, Cisco knew of the '211 patent, and knew that Core had asserted that patent against Fujitsu, at least as early as ***July 7, 2016***. That is more than three years before the expiration of the '211 patent, on November 4, 2019. Thus, for ***at least three years***, Cisco continued to sell the Accused Instrumentalities, and to assist its customers in the infringing use of such Instrumentalities, despite being admittedly aware of the '211 patent.

74. Cisco's Interrogatory Response remains incomplete. For instance, although requested by Interrogatory No. 7, it does not identify "any related subsequent action undertaken by Cisco or another person on its behalf, including, but not limited to, all studies, analyses, and examinations of the '211 patent, its scope, or its claims." Moreover, despite several Requests for Production directed specifically to this issue, Cisco has refused to produce any documents showing: (i) how Fujitsu informed Cisco of the '211 patent; (ii) what Cisco communicated in response; or (iii) any subsequent action in the form of studies, analysis, or examinations regarding the '211 patent and its infringement. Core has demanded appropriate discovery supplementation from Cisco, and Cisco has requested additional time to consider

these demands and respond, and Core prepared to proceed before the Magistrate on these important discovery issues. Core reserves the right to amend this Complaint to identify additional facts supporting its claim of indirect infringement once such information has been produced by Cisco.

75. Nonetheless, even based on the incomplete information that has been produced so far, it is clear that Cisco knew (or was willfully blind) that normal use of the Accused Instrumentalities infringes the Asserted Claims of the '211 patent.

76. The products that Core accused of infringement in the *Fujitsu* case are highly similar to the products Core accuses of infringement in this case. In the *Fujitsu* case, which was C.D. Cal. Case No. 16-cv-0437, Core accused Fujitsu's "40G (coherent) and 100G solutions that embody the patented inventions," including Fujitsu's "100G Transponder, 100G Muxponder, 40G Transponder (coherent), FLASHWAVE 9500 Packet Optical Networking Platform [and] FLASHWAVE 7500 Packet Optical Networking Platform (coherent)." Ex. 27 (Fujitsu Complaint) at 3, ¶ 9. These allegations were a matter of public record.

77. As Core explained in its Infringement Contentions in the Fujitsu case (Ex. 28), the accused Fujitsu products infringed claims of the '211 patent because they performed infringing dual-polarization communication with a "cross polarization interference canceler," or XPIC. Ex. 28 at 21-26. As Core explained, Fujitsu's products contained an "XPIC" because they contained a "butterfly filter" that computed the ***inverse of the transmission matrix*** of the fiberoptic medium. *Id.* That is exactly how Cisco's accused products operate. *See* Paragraphs 39-41 *supra*.

78. Since Cisco's and Fujistu's accused products operate in essentially the same way—and since Cisco admits that it discussed the '211 patent with Fujitsu by July 7, 2016—on information and belief, Cisco must have learned (or been willfully blind), either from Fujitsu, or from its own analysis of the '211 patent, that the Accused Instrumentalities practice the '211 patent during normal use at that time.

79. Cisco is a sophisticated company with ~$50 billion in annual revenue.

On information and belief, Cisco has a large intellectual property legal department, with multiple in-house counsel devoted to analyzing patent issues. Cisco also has relationships with many outside law firms to address patent issues.

80. On information and belief, once Cisco learned of the '211 patent from Fujitsu—and given the known close similarity between the products accused of infringement in the *Fujitsu* case, and Cisco's own Accused Instrumentalities—Cisco must have analyzed the '211 patent on or after July 7, 2016 to determine whether the Accused Instrumentalities infringed claims of the '211 patent. Upon performing such an analysis, Cisco must have concluded that the Accused Instrumentalities do infringe, at least, the Asserted Claims of the '211 patent, because (per Paragraphs 19-49 *supra*) it is manifest that Cisco's Accused Instrumentalities practice during normal use all the elements of, at least, claim 33, and the remaining asserted claims of the '211 patent which were also asserted in the *Fujitsu* case.

81. If Cisco did ***not*** perform an analysis of whether the Accused Instrumentalities infringe the '211 patent, upon being notified by Fujitsu, then such a failure to act would constitute willful blindness. Clearly, Cisco has always known that its Accused Instrumentalities perform dual-polarization communication using an XPIC. Once Fujitsu informed Cisco that it had been sued under the '211 patent for selling products that perform dual-polarization communication using an XPIC, any reasonable party in Cisco's position would have analyzed its own products that perform dual-polarization communication using an XPIC, to determine whether those products infringe the '211 patent. In the unlikely event that Cisco chose not to perform such an analysis, then that constitutes willful blindness, which is an equally-culpable mental state for purposes of indirect infringement.

82. Beyond Cisco's Interrogatory Response, additional evidence supports the conclusion that Cisco knew of the '211 patent prior to the expiration of the '211 patent, and knew (or was willfully blind) that normal use of the Accused Instrumentalities infringes the Asserted Claims of the '211 patent.

83. For example, in addition to learning of the '211 patent through the *Fujitsu* case, on information and belief, Cisco also learned of the '211 patent due to Core's filing of complaints for infringement of that patent in: (1) Central District of California Case No. SACV 12-1872 AG, styled *Core Optical Technologies, LLC v. Ciena Corporation, et al*. (filed October 29, 2012) (the "*Ciena* case"); and (2) Central District of California Case No. SACV 8:17-cv-00548AG, styled *Core Optical Technologies, LLC v. Infinera Corp*. (filed March 24, 2017) (the "*Infinera* case").

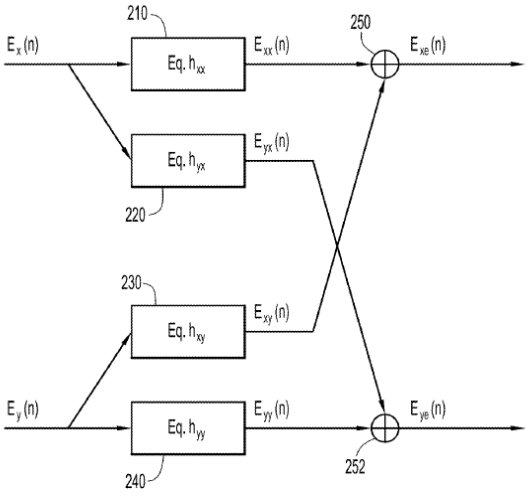
84. On information and belief, as a major participant in the optical networking industry (e.g., Cisco recently this year purchased Acacia, a supplier of chips used in infringing devices for), Cisco monitors patent lawsuits against other participants in the industry. On information and belief, through such monitoring, Cisco knew of—or was willfully blind to—the existence of the '211 Patent, due to Core's filing and prosecution of the *Ciena* and *Infinera* cases. On information and belief, through such monitoring, Cisco knew—or was willfully blind—that its Fiber Optic XPIC Devices infringe the '211 Patent during normal use.

85. For instance, when (on information and belief) Cisco learned of the '211 patent through Core's filing of the *Ciena* case in 2012, Cisco (on information and belief) analyzed the '211 patent to determine whether it posed an infringement risk. The products accused of infringement in the *Ciena* case were highly similar to the Accused Instrumentalities—i.e., they are fiber optic networking devices that perform dual-polarization communication using an XPIC. On information and belief, once Cisco learned that Ciena's dual-polarization products using an XPIC had been accused of infringing the '211 patent, Cisco analyzed its own dual-polarization products using an XPIC—i.e., the Accused Instrumentalities—to determine whether they infringed the '211 patent. On information and belief, when Cisco conducted that analysis, it determined that the Accused Instrumentalities infringe the Asserted Claims. Thus, on information and belief, Cisco learned of the relevance of the '211 patent at least as early as October 29, 2012, when the *Ciena* case was filed.

86. Cisco also learned of the '211 patent, prior to its expiration and prior to the filing of Core's complaint, through its patent prosecution activities.

87. Cisco applied for, and received, U.S. Patent No. 9,515,745 ("the '745 patent"), titled "Adaptive Equalization in Coherent Receivers using a Stokes Space Update Algorithm." A copy of the '745 patent is attached as Exhibit 12. The application for the '745 patent was filed on March 6, 2014 – nearly a decade after the '211 patent issued – and the '745 patent issued on December 6, 2016.

88. The '745 patent covers technology directly related to the '211 patent. Like the '211 patent, the '745 patent describes a "coherent optical receiver," which receives optical signals having a "first polarization" and a "second polarization" – i.e., polarization-multiplexed signals. *See* Ex. 12, Abstract. It further describes, and claims, an "adaptive butterfly equalizer" which "performs polarization de-multiplexing and dynamic compensation of polarization effects (e.g., polarization mode dispersion (PDM) and polarization dependent loss (PDL))." *Id.* at 1:11-21. This "adaptive butterfly equalizer" can be constructed as "four equalizers 210, 220, 230, 240 arranged in a butterfly configuration," as shown in Figure 2, reproduced below:



89. The equalizer structure shown in Fig. 2 of the '745 patent, *supra*, is essentially the same XPIC filter configuration depicted in Fig. 4A of the '211 patent.

Thus, the alleged "invention" in the '745 patent is directly related to Core's invention, which Core disclosed over a decade earlier in the '211 patent.

90. On October 22, 2015, the Examiner issued a First Office Action in the '745 prosecution. *See* Exh. 13 (10/22/2015 Office Action). In the Office Action, the Examiner identified thirteen prior art references that were "pertinent to applicant's disclosure," and made those references "of record" in the prosecution. *Id.* at 13-15. One of those references was ***the '211 patent***. *Id.* at 15. The '211 patent is now listed on the face of the '745 patent as a "reference cited" by the Examiner.

91. Accordingly, Cisco was further advised of the existence and relevance of the '211 patent on October 22, 2015, when it was cited as a pertinent prior art reference during prosecution of Cisco's '745 patent on ***directly related*** technology.

92. Because the '745 patent related to dual-polarization communication using an XPIC—and because the '211 patent was cited as relevant prior art to such technology—on information and belief, Cisco reviewed the '211 patent after it was cited in prosecution of the '745 patent, to determine whether Cisco's own products that perform dual-polarization communication using an XPIC—i.e., the Accused Instrumentalities—infringe the '211 patent. On information and belief, when Cisco conducted that analysis, it determined that the Accused Instrumentalities do infringe, at least, the Asserted Claims of the '211 patent.

93. In view of the foregoing, at all relevant times, Defendants have known about the existence and relevance of the '211 patent, and have known that the operation of the Fiber Optic XPIC Devices, as configured and used during normal operation, infringe the Asserted Claims during normal use.

94. On information and belief, when Defendants sold the Fiber Optic XPIC Devices to U.S. customers, and/or provided service, maintenance, technical support, or other active assistance to such customers, they did so with the specific intent to encourage the customers to perform acts constituting direct infringement of the '211 Patent. This is evidenced by Paragraphs 70-93 *supra*, which show that Defendants

were aware of the existence and relevance of the '211 patent at all relevant times. Because Defendants were aware of the '211 patent's relevance and existence, they always knew – based on information and belief – that their customers' use of the Fiber Optic XPIC Devices would constitute infringement of that patent. Defendants' decision to continue marketing the Fiber Optic XPIC Devices to U.S. customers, despite knowing that such customers' use would constitute direct infringement, evidences that Defendants had a specific intent to encourage direct infringement of the '211 patent by its customers.

95. Therefore, Defendants have unlawfully induced infringement of the '211 Patent, in violation of 35 U.S.C. § 271(b).

COUNT III – CONTRIBUTORY INFRINGEMENT (35 U.S.C. § 271(c))

96. Plaintiff repeats and realleges each and every allegation contained in Paragraphs 1-95 *supra*, as if fully set forth herein.

97. Defendants have committed contributory infringement of the Asserted Claims of the '211 Patent, in violation of 35 U.S.C. § 271(c).

98. Defendants have committed contributory infringement by selling, offering to sell and/or importing into the United States the Fiber Optic XPIC Devices. As shown in Paragraphs 19-49 *supra,* the Fiber Optic XPIC Devices contain components—including the coherent optical receivers, and accompanying electronics, in the "interface cards" or "line cards"—which, as configured, perform cross-polarization interference mitigation on polarization-multiplexed optical signals during use. These components, when used as configured during normal operation, practice the inventions claimed in the Asserted Claims.

99. The components of the Fiber Optic XPIC Devices that are used to mitigate cross-polarization interference practice a material part of the Asserted Claims, because they perform one of the key inventive functions of the '211 Patent – i.e., they mitigate the effects of cross-polarization interference, using matrix operations, to reconstruct the original polarization-division-multiplexed signals.

100. On information and belief, prior to the filing of the Complaint, Defendants had actual knowledge, or were willfully blind, that these components of the Fiber Optic XPIC Devices were especially made or adapted for use in a manner that infringes the Asserted Claims of the '211 Patent. As shown in Paragraphs 70-94 *supra*, Defendants knew, or were willfully blind, that the Fiber Optic XPIC Devices are configured to infringe the '211 Patent upon use. For the reasons set forth in Paragraphs 70-93, and on information and belief, Defendants knew, or were willfully blind, that normal use of the Fiber Optic XPIC Devices infringes the Asserted Claims of the '211 Patent. Despite that knowledge (or willful blindness), Defendants actively sold the Fiber Optic XPIC Devices in the United States, knowing their customers would use those devices in the United States, and knowing (or being willfully blind) that such use would constitute direct infringement of the Asserted Claims.

101. The components of the Fiber Optic XPIC Devices that are configured to perform cross-polarization interference mitigation, including the portions of the "signal processor" in the coherent optical receiver that compute the "inverse of the optical system matrix" (Ex. 7 at 4), are not staple articles of commerce, and—as configured to perform cross-polarization interference mitigation during normal operation—are not capable of substantial noninfringing use. To the contrary, these components, as configured, are ***especially adapted*** to perform the claimed cross-polarization interference mitigation methods, during normal use. *Id.*

102. For example, the Fiber Optic XPIC Devices include the NCS 1002 and NCS 1004 Platforms. Based on the Datasheets for these Platforms, they ***always*** operate in polarization-division multiplexed mode. Ex. 4 at 1 (listing three available "modulation formats" for the NCS 1002, all which are "coherent polarization-multiplexed" formats); Ex. 5 at 3 (listing eleven available "modulation schemes" for the NCS 1004, all which of are "PM" (polarization multiplexed) formats). Similarly, the Datasheets for the NCS 2000 100-Gbps Coherent DWDM Trunk Card, the NCS 2000 200-Gbps Multirate DWDM Line Card, the NCS 2000 400 Gbps XPonder Line

Card, and the ONS 15454 100Gbps Trunk Card indicate that these cards ***always*** operate in polarization-division multiplexed mode. *See* Ex. 8 at 3; Ex. 9 at 1; Ex. 10 at 3; Ex. 7 at 3-4. Additionally, Cisco's Datasheets indicate that the NCS 4000 2x100G DWDM Line Card (Ex. 29 at 1), the 1.2-Tbps IPoDWDM Modular Line Card (Ex. 19 at 2), the ASR 9000 400-Gbps IPoDWDM Line Card (Ex. 20 at 2), and the CRS 1-Port 100 Gigabit Ethernet Coherent DWDM Interface Module (Ex. 21 at 1-4) always use dual-polarization (polarization-division multiplexing) on the trunk, or line, side.

103. As shown in Paragraphs 19-49 *supra*, when one of the Fiber Optic XPIC Devices is configured to operate in polarization-division multiplexed mode, it ***necessarily*** infringes the Asserted Claims. Thus, because the Fiber Optic XPIC Devices listed in Paragraph 102 *supra* always operate in polarization-division multiplexed mode, when they are properly configured, they have no non-infringing uses. Accordingly, at the very least, the Fiber Optic XPIC Devices listed in Paragraph 102 *supra* are not capable of substantial non-infringing use.

104. On information and belief, there are additional platforms, line cards, interface cards, transceivers, or other components in the Fiber Optic XPIC Devices that lack substantial non-infringing uses. Core expects that much of the information about these components is non-public. Core expects that, through discovery, it may uncover additional evidence regarding components of the Fiber Optic XPIC Devices that, as configured, are incapable of substantial non-infringing use. Core reserves the right to amend its Complaint to identify such additional components as they are uncovered in discovery, to the maximum extent permitted by law.

105. Accordingly, Defendants have unlawfully contributed to infringement of the '211 Patent, in violation of 35 U.S.C. § 271(c).

REMEDIES, ENHANCED DAMAGES, EXCEPTIONAL CASE

106. Plaintiff repeats and realleges each and every allegation contained in Paragraphs 1-105 *supra*, as if fully set forth herein.

107. Defendants' direct infringement (Count I), induced infringement (Count

II) and contributory infringement (Count III) of the '211 patent has caused, and will continue to cause, significant damage to Core. As a result, Core is entitled to an award of damages adequate to compensate it for Defendants' infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284. Core is also entitled to recover prejudgment interest, post-judgment interest, and costs.

108. For at least the reasons set forth in Paragraphs 70-93 *supra*, prior to the expiration of the '211 Patent, Defendants knew (or were willfully blind) that the Fiber Optic XPIC Devices are configured to infringe the Asserted Claims of the '211 Patent during normal use. Despite this known, objectively-high likelihood that its actions constituted direct and indirect infringement, Defendants continued to directly and indirectly infringe the '211 patent, up to the filing of this Complaint. Accordingly, Defendants' infringement has been (and is) willful.

109. In addition to being willful, Defendants' conduct has been egregious.

110. As set forth in Paragraphs 70-93 *supra*, despite knowing of (or being willfully blind to) their infringement, Defendants continued to infringe, on a large scale, up to the very date when the '211 patent expired. Cisco is a massive company, with over $50 billion in annual revenue.[1] Meanwhile, Plaintiff is a small company, owned by an individual inventor. On information and belief, Defendants persisted in their willful infringement, at least in part, because they believed they could use their superior resources to overwhelm Plaintiff in litigation. If proven, this would constitute "egregious" conduct, warranting enhanced damages.

111. Furthermore, Cisco's litigation conduct in this case has been, and continues to be, egregious. Cisco has flagrantly failed to conduct discovery in a good faith manner. For instance, despite admittedly learning of the '211 patent by July 7, 2016, and despite numerous document requests directed to the issue, Cisco has not

[1] *See* https://www.statista.com/statistics/271853/worldwide-net-sales-of-cisco-systems-since-2006/.

produced a ***single document*** evidencing its understanding of whether it infringed the '211 patent, and has also refused to identify any such documents on a privilege log. Cisco's refusal to produce such information has directly prejudiced Core's ability to fulsomely plead indirect and willful infringement (despite Cisco's knowledge of the April 28, 2021 deadline to amend pleadings in this case). Moreover, while Core served a comprehensive set of 129 Requests for Production on November 9, 2020, covering virtually all issues in the case (direct infringement, indirect infringement, damages, validity, willfulness, etc.), Cisco has produced a grand total of ***118 documents***—the vast majority of which are publicly available. Despite Core's repeated complaints about Cisco's inadequate production, Cisco still has not produced: (i) a ***single*** contract with its customers for the Accused Instrumentalities; (ii) a ***single*** document regarding its pricing and business strategies for the Accused Instrumentalities; (iii) a ***single*** document regarding its involvement in installing and using the Accused Instrumentalities in the United States; and many other types of documents expressly requested in Core's Requests for Production. Cisco has also provided vastly incomplete sales information, and deficient interrogatory responses, again despite repeated complaints by Core as to Cisco's deficiencies. Such bad faith refusal to participate in discovery constitutes egregious conduct.

112. Moreover, the validity of the '211 patent has been thrice confirmed by the Patent Trial and Appeal Board ("PTAB"), in: (i) IPR2016-01618, filed by Fujitsu Network Communications, Inc.; (ii) IPR2018-01259, filed by Infinera Corporation; and (iii) IPR2020-01664, filed by Nokia and Juniper. In all three *Inter Partes* Review proceedings, the Petitioners—who were defendants in litigation—cited numerous prior art references, to attempt to establish that claims of the '211 patent, including the Asserted Claims, were invalid. Yet, in all three cases, the PTAB ***denied*** institution, finding that the Petitioners had failed to establish a "reasonable likelihood" that ***any*** claim of the '211 patent was invalid. *See* Ex. 14 (decision denying review in IPR2016-01618); Ex. 15 (decision denying review in IPR2018-

01259); Ex. 30 (decision denying review in IPR2020-01664). Because the PTAB has already rejected three extensive invalidity challenges to the '211 patent, Defendants cannot reasonably believe that they have a viable invalidity defense. Defendants' decision to persist in known, clearly-infringing conduct, despite the lack of any viable invalidity defense, is further evidence of "egregiousness."

113. For at least the foregoing reasons, Defendants' conduct has been willful and egregious. Accordingly, under 35 U.S.C. § 284, the Court should enhance Core's damages in this case by up to three times the amount found or assessed.

114. For at least the foregoing reasons, this case is an "exceptional" case within the meaning of 35 U.S.C. § 285. Accordingly, Core is entitled to an award of attorneys' fees and costs, and the Court should award such fees and costs.

PRAYER FOR RELIEF

WHEREFORE, Core prays for relief as follows:

1. That judgment be entered in favor of Core, and against Defendants;

2. That Core be awarded damages adequate to compensate it for Defendants' infringement of the Asserted Claims of the '211 Patent, in an amount to be determined at trial, as well as interest thereon;

3. That Core be awarded the costs of suit;

4. That Defendants' infringement be declared willful and egregious;

5. That the Court increase Core's damages up to three times the amount assessed under 35 U.S.C. § 284;

5. That the Court declare this an exceptional case under 35 U.S.C. § 285, and award Core its attorneys' fees and costs incurred in this action; and

6. That the Court grant such further relief as it deems just and proper.

JURY TRIAL DEMAND

Core demands a jury trial on all issues so triable.

DATED: May 7, 2021

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