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

APEX BEAM TECHNOLOGIES LLC,	§ § §	Case No.
Plaintiff,	§ § §	**JURY TRIAL DEMANDED**
v.	§ § §	
ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD.,	§ § §	
Defendant.	§ § §	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Apex Beam Technologies LLC ("ABT" or "Plaintiff") for its Complaint against Defendant OnePlus Technology (Shenzhen) Co., Ltd. ("OnePlus" or "Defendant") alleges as follows:

THE PARTIES

1.   ABT is a limited liability company organized and existing under the laws of the State of Texas, with its principal place of business located at 104 East Houston Street, Suite 180, Marshall, Texas 75670.

2.   Upon information and belief, OnePlus is a corporation organized and existing under the laws of China, with its principal place of business located at 18F, Tairan Building, Block C, Tairan 8th Road, Chegongmiao, Futian District, Shenzhen, Guangdong 518040, China, and may be served pursuant to the provisions of the Hague Convention. OnePlus is a leading manufacturer and seller of smartphones in the world and in the United States. Upon information and belief, OnePlus does business in Texas and in the Eastern District of Texas, directly or through its subsidiaries.

3.   Defendant has authorized sellers and sales representatives that offer and sell products pertinent to this Complaint through the State of Texas, including in this Judicial District, and to consumers

throughout this Judicial District, such as: T-Mobile, 5722 Eldorado Parkway, Suite 120, Frisco, Texas

75033, 2831 Eldorado Parkway, Suite 104, Frisco, Texas 75033, 550 S. Preston Road, Suite 40, Prosper,

Texas 75078, and 5899 Eastex Freeway, Suite 100, Beaumont, Texas 77706.

JURISDICTION

4.   This is an action for patent infringement arising under the patent laws of the United

States, 35 U.S.C. §§ 1, *et seq*. This Court has jurisdiction over this action pursuant to 28 U.S.C.

§§ 1331 and 1338(a) and 1367.

5.   This Court has specific and personal jurisdiction over the Defendant consistent with

the requirements of the Due Process Clause of the United States Constitution and the Texas Long

Arm Statute. Upon information and belief, the Defendant has sufficient minimum contacts with

the forum because Defendant transacts substantial business in the State of Texas and in this Judicial

District. Further, Defendant has, directly or through subsidiaries or intermediaries, committed and

continues to commit acts of patent infringement in the State of Texas and in this Judicial District

as alleged in this Complaint, as alleged more particularly below. For example, on information and

belief, the Accused Products are available for purchase in this Judicial District.

6.   Venue is proper in this Judicial District pursuant to 28 U.S.C. § 1391(b) and (c)

because the Defendant is a foreign company that may be sued in any Judicial District, including

the Eastern District of Texas. The Defendant is subject to personal jurisdiction in this Judicial

District and has committed acts of patent infringement in this Judicial District. On information and

belief, the Defendant through its own acts and/or through the acts of others, makes, uses, sells,

and/or offers to sell infringing products within this Judicial District, regularly does and solicits

business in this Judicial District, and has the requisite minimum contacts with the Judicial District

such that this venue is a fair and reasonable one. Further, upon information and belief, the

Defendant has admitted or not contested proper venue in this Judicial District in other patent infringement actions.

PATENTS-IN-SUIT

7.   On October 29, 2019, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,462,767 (the "'767 Patent") entitled "Method and Device in UE and Base Station Used for Paging." A true and correct copy of the '767 Patent is available at http://pdfpiw.uspto.gov/.piw?PageNum=0&docid=10462767.

8.   On February 18, 2020, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,568,113 (the "'113 Patent") entitled "Method and Device in UE and Base Station Used for Wireless Communication." A true and correct copy of the '113 Patent is available at http://pdfpiw.uspto.gov/.piw?PageNum=0&docid=10568113.

9.   On February 2, 2021, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,912,081 (the "'081 Patent") entitled "Method and Device used for Wireless Communication in UE and Base Station." A true and correct copy of the '081 Patent is available at http://pdfpiw.uspto.gov/.piw?PageNum=0&docid=10912081.

10.   On March 9, 2021, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,944,527 (the "'527 Patent") entitled "Method and Device for Multi-Antenna Transmission in UE and Base Station." A true and correct copy of the '527 Patent is available at http://pdfpiw.uspto.gov/.piw?PageNum=0&docid=10944527.

11.   On March 16, 2021, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,951,271 (the "'271 Patent") entitled "Method and Device for Multi-Antenna Transmission in UE and Base Station." A true and correct copy of the '271 Patent is available at http://pdfpiw.uspto.gov/.piw?PageNum=0&docid=10951271.

12.   ABT is the sole and exclusive owner of all right, title, and interest in the '767 Patent, the '113 Patent, the '081 Patent, the '527 Patent, and the '271 Patent (collectively, the "Patents-in-Suit") and holds the exclusive right to take all actions necessary to enforce its rights to the Patents-in-Suit, including the filing of this patent infringement lawsuit. ABT also has the right to recover all damages for past, present, and future infringement of the Patents-in-Suit.

FACTUAL ALLEGATIONS

13.   The Patents-in-Suit generally cover systems and methods for transmission schemes in wireless communication systems.

14.   The '767 Patent generally relates to technology that determines paging interval schedules that enable mobile handsets to be reached by paging with minimal complexity while maintaining low power consumption. The technology described in the '767 Patent was developed by Xiaobo Zhang of Shanghai Langbo Communication Technology Company Limited. By way of example, this technology is implemented today in the Accused Products (*e.g.,* 5G mobile handsets and tablets).

15.   The '113 Patent generally relates to technology that uses signal timing to improve signal delivery upon a beam recovery request. The technology described in the '113 Patent was developed by Xiaobo Zhang of Shanghai Langbo Communication Technology Company Limited. By way of example, this technology is implemented today in the Accused Products (*e.g.*, 5G mobile handsets and tablets).

16.   The '081 Patent generally relates to technology that uses symbol reception timing to determine beam or port location to improve communication quality. The technology described in the '081 Patent was developed by Xiaobo Zhang of Shanghai Langbo Communication

Technology Company Limited. By way of example, this technology is implemented today in the Accused Products (*e.g.*, 5G mobile handsets).

17.   The '527 Patent generally relates to technology that provides mobile handsets with antenna virtualization information to determine correct beam alignment to enhance transmission quality. The technology described in the '527 Patent was developed by Xiaobo Zhang of Shanghai Langbo Communication Technology Company Limited. By way of example, this technology is implemented today in the Accused Products (*e.g.*, 5G mobile handsets and tablets).

18.   The '271 Patent generally relates to technology that uses channel qualities and differential-based reporting compared to a threshold to assist in beam selection. The technology described in the '271 Patent was developed by Xiaobo Zhang of Shanghai Langbo Communication Technology Company Limited. By way of example, this technology is implemented today in the Accused Products (*e.g.*, 5G mobile handsets and tablets).

19.   Defendant has infringed and continues to infringe one or more of the Patents-in-Suit by making, using, selling, offering to sell, and/or importing, and by actively inducing others to make, use, sell, offer to sell, and/or import, products that implement the 5G standards. For example, the Accused Products include at least the OnePlus Nord, OnePlus Nord 2, OnePlus Nord 2 x Pac-Man Edition, OnePlus Nord CE 5G, OnePlus Nord LE, OnePlus Nord N10 5G, OnePlus Nord N200 5G, OnePlus 9, OnePlus 9 Pro, OnePlus 9R, OnePlus 9RT, OnePlus 8, OnePlus 8 Pro, OnePlus 8T, and the OnePlus 8T Cyberpunk 2077 Limited Edition.

COUNT I
(Infringement of the '767 Patent)

20.   Paragraphs 1 through 19 are incorporated by reference as if fully set forth herein.

21.   ABT has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the '767 Patent.

22.   Defendant has and continues to directly infringe the '767 Patent either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '767 Patent. Such products include at least the Accused Products including, but not limited to, the OnePlus Nord, OnePlus Nord 2, OnePlus Nord 2 x Pac-Man Edition, OnePlus Nord CE 5G, OnePlus Nord LE, OnePlus Nord N10 5G, OnePlus Nord N200 5G, OnePlus 9, OnePlus 9 Pro, OnePlus 9R, OnePlus 9RT, OnePlus 8, OnePlus 8 Pro, OnePlus 8T, and the OnePlus 8T Cyberpunk 2077 Limited Edition which practice a method in a User Equipment (UE) for paging, comprising: monitoring a first signaling in X time intervals; and receiving a first radio signal; wherein X is a positive integer; the first signaling is used for determining scheduling information for the first radio signal; the scheduling information comprises at least one of (occupied time-frequency resource, adopted Modulation Coding Scheme (MCS), subcarrier spacing of subcarriers in occupied frequency domain resource); the first radio signal carries a paging message; the frequency domain resource used for transmitting the first signaling belongs to a first subband; the first subband comprises a positive integer number of consecutive subcarriers in frequency domain; and at least one of (location of the first subband in frequency domain, subcarrier spacing of subcarriers included in the first subband) is used for determining the X time intervals.

23.   For example, Defendant has and continues to directly infringe at least claim 1 of the '767 Patent by making, using, offering to sell, selling, and/or importing into the United States products that implement the 5G standards such as the Accused Products (*e.g.*, 5G mobile handsets and tablets). For example, the OnePlus 9 Pro operates on 5G networks and includes firmware for implementing 3rd Generation Partnership Product (3GPP) specifications.

24.   The Accused Products perform a method in a User Equipment (such as the OnePlus 9 Pro) for paging comprising: monitoring a first signaling (*e.g.*, Paging DCI) in X time intervals (*e.g.*, PDCCH monitoring occasions); and receiving a first radio signal (*e.g.*, PCCH, PCH, or PDSCH); wherein X is a positive integer; the first signaling is used for determining scheduling information for the first radio signal; the scheduling information comprises at least one of occupied time-frequency resource, adopted Modulation Coding Scheme (MCS), subcarrier spacing of subcarriers in occupied frequency domain resource); the first radio signal carries a paging message; the frequency domain resource used for transmitting the first signaling belongs to a first subband (*e.g.*, a BWP); the first subband comprises a positive integer number of consecutive subcarriers in frequency domain; and at least one of (location of the first subband in frequency domain, subcarrier spacing of subcarriers included in the first subband) is used for determining the X time intervals.

25.   Defendant has and continues to indirectly infringe one or more claims of the '767 Patent by knowingly and intentionally inducing others, including OnePlus customers and end-users, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling, and/or importing into the United States products that include infringing technology, such as the Accused Products (*e.g.*, 5G mobile handsets and tablets).

26.   Defendant, with knowledge that these products, or the use thereof, infringes the '767 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '767 Patent by providing these products to end-users for use in an infringing manner.

27.   Defendant has induced infringement by others, including end-users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high

probability that others, including end-users, infringe the '767 Patent, but while remaining willfully

blind to the infringement.

28.   ABT has suffered damages as a result of Defendant's direct and indirect

infringement of the '767 Patent in an amount to be proved at trial.

COUNT II
(Infringement of the '113 Patent)

29.   Paragraphs 1 through 19 are incorporated by reference as if fully set forth herein.

30.   ABT has not licensed or otherwise authorized Defendant to make, use, offer for

sale, sell, or import any products that embody the inventions of the '113 Patent.

31.   Defendant has and continues to directly infringe the '113 Patent, either literally or

under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making,

using, offering to sell, selling, and/or importing into the United States products that satisfy each

and every limitation of one or more claims of the '113 Patent. Such products include at least

Accused Products including, but not limited to, the OnePlus Nord, OnePlus Nord 2, OnePlus Nord

2 x Pac-Man Edition, OnePlus Nord CE 5G, OnePlus Nord LE, OnePlus Nord N10 5G, OnePlus

Nord N200 5G, OnePlus 9, OnePlus 9 Pro, OnePlus 9R, OnePlus 9RT, OnePlus 8, OnePlus 8 Pro,

OnePlus 8T, and the OnePlus 8T Cyberpunk 2077 Limited Edition Axon 10 Pro 5G which practice

a method in a User Equipment (UE) for wireless communication, comprising: receiving a target

radio signal; transmitting a first radio signal on a first channel; transmitting a second radio signal

on a second channel; and monitoring a third radio signal in a first time window; wherein a

measurement for the target radio signal obtains a target measurement value, the target

measurement value, when higher than a target threshold is used for triggering the transmission of

the first radio signal and the second radio signal; a time resource occupied by the first radio signal

is used for determining the start time of the first time window; a time domain resource occupied

by the first radio signal is used for determining a second time window, a time domain resource occupied by the second radio signal is within the second time window, and the second time window is within the first time window; a time domain resource occupied by the second radio signal is used for determining a third time window, and the end time of the third time window is the end time of the first time window; and the second time window and the third time window have overlapped time domain resource(s).

32.   For example, Defendant has and continues to directly infringe at least claim 1 of the '113 Patent by making, using, offering to sell, selling, and/or importing into the United States products that implement the 5G standards, such as the Accused Products (*e.g.*, 5G mobile handsets and tablets). For example, the OnePlus 9 Pro operates on 5G networks and includes firmware for implementing 3rd Generation Partnership Product (3GPP) specifications).

33.   The Accused Products perform a method in a User Equipment (such as the OnePlus 9 Pro) for wireless communication, comprising: receiving a target radio signal (*e.g.*, SS); transmitting a first radio signal (*e.g.*, MsgA) on a first channel (*e.g.*, PRACH, PUSCH); transmitting a second radio signal (*e.g.*, PUSCH scheduled by a RAR UL grant) on a second channel (*e.g.*, PUSCH); and monitoring a third radio signal in a first time window (*e.g.*, covering the time from the beginning of the second time window to the end of the third time window); wherein a measurement for the target radio signal obtains a target measurement value, the target measurement value, when higher than a target threshold is used for triggering the transmission of the first radio signal and the second radio signal; a time resource occupied by the first radio signal is used for determining the start time of the first time window; a time domain resource occupied by the first radio signal is used for determining a second time window (*e.g.*, *msgB-ResponseWindow* configured by RRC signaling), a time domain resource occupied by the second

radio signal is within the second time window, and the second time window is within the first time window; a time domain resource occupied by the second radio signal is used for determining a third time window (*i.e.*, running time of *ra-ContentionResolutionTimer*), and the end time of the third time window is the end time of the first time window; and the second time window and the third time window have overlapped time domain resource(s).

34.   Defendant has and continues to indirectly infringe one or more claims of the '113 Patent by knowingly and intentionally inducing others, including OnePlus customers and end-users, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling, and/or importing into the United States products that include infringing technology, such as the Accused Products (*e.g.*, 5G mobile handsets and tablets).

35.   Defendant, with knowledge that these products, or the use thereof, infringes the '113 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '113 Patent by providing these products to end-users for use in an infringing manner.

36.   Defendant has induced infringement by others, including end-users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end-users, infringe the '113 Patent, but while remaining willfully blind to the infringement.

37.   ABT has suffered damages as a result of Defendant's direct and indirect infringement of the '113 Patent in an amount to be proved at trial.

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COUNT III
(Infringement of the '081 Patent)

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38.   Paragraphs 1 through 19 are incorporated by reference as if fully set forth herein.

39.   ABT has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the '081 Patent.

40.   Defendant has and continues to directly infringe the '081 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '081 Patent. Such products include at least Accused Products including, but not limited to, the OnePlus Nord, OnePlus Nord 2, OnePlus Nord 2 x Pac-Man Edition, OnePlus Nord CE 5G, OnePlus Nord LE, OnePlus Nord N10 5G, OnePlus Nord N200 5G, OnePlus 9, OnePlus 9 Pro, OnePlus 9R, OnePlus 9RT, OnePlus 8, OnePlus 8 Pro, OnePlus 8T, and the OnePlus 8T Cyberpunk 2077 Limited Edition which practice a method in a User Equipment (UE) for wireless communication, comprising: receiving a second radio signal; receiving a first radio signal; wherein the first radio signal is transmitted within a first time unit, a first bit block is used for generating the first radio signal, and the first radio signal comprises G multicarrier symbols; the second radio signal is transmitted within the first time unit, and the second radio signal is used for determining a time-domain resource occupied by the G multicarrier symbols; as for any one given multicarrier symbol of the G multicarrier symbols, the multi-antenna related receiving for the given multicarrier symbol is related to the relative position of a time-domain resource occupied by the given multicarrier symbol with respect to a first time point in time domain; when the time-domain resource occupied by the given multicarrier symbol is behind the first time point, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol; and when the time-domain resource occupied by the given multicarrier symbol is before the first time point, the multi-antenna related receiving for the

given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal; the first time point is one time point within the first time unit; and G is a positive integer.

41.   For example, Defendant has and continues to directly infringe at least claim 1 of the '081 Patent by making, using, offering to sell, selling, and/or importing into the United States products that implement the 5G standards, such as the Accused Products (*e.g.*, 5G mobile handsets and tablets). For example, the OnePlus 9 Pro operates on 5G networks and includes firmware for implementing 3rd Generation Partnership Product (3GPP) specifications).

42.   The Accused Products perform a method in a User Equipment (*e.g.*, OnePlus 9 Pro) for wireless communication, comprising: receiving a second radio signal (*e.g.*, DL DCI); receiving a first radio signal (*e.g.*, PDSCH); wherein the first radio signal is transmitted within a first time unit, a first bit block is used for generating the first radio signal, and the first radio signal comprises G multicarrier symbols; the second radio signal is transmitted within the first time unit, and the second radio signal is used for determining a time-domain resource (*e.g.*, time offset) occupied by the G multicarrier symbols; as for any one given multicarrier symbol of the G multicarrier symbols, the multi-antenna related receiving for the given multicarrier symbol is related to the relative position of a time-domain resource occupied by the given multicarrier symbol with respect to a first time point (*e.g.*, reception time of DCL DCI delayed by *Threshold-Sched-Offset*) in time domain; when the time-domain resource occupied by the given multicarrier symbol is behind the first time point, the second radio signal is used for determining the multi-antenna related receiving for the given multicarrier symbol; and when the time-domain resource occupied by the given multicarrier symbol is before the first time point, the multi-antenna related receiving for the given multicarrier symbol is related to the multi-antenna related receiving for the second radio signal; the first time point is one time point within the first time unit; and G is a positive integer.

43.   Defendant has and continues to indirectly infringe one or more claims of the '081 Patent by knowingly and intentionally inducing others, including OnePlus customers and end-users, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling, and/or importing into the United States products that include infringing technology, such as the Accused Products (*e.g.*, 5G mobile handsets and tablets).

44.   Defendant, with knowledge that these products, or the use thereof, infringes the '081 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '081 Patent by providing these products to end-users for use in an infringing manner.

45.   Defendant has induced infringement by others, including end-users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end-users, infringe the '081 Patent, but while remaining willfully blind to the infringement.

46.   ABT has suffered damages as a result of Defendant's direct and indirect infringement of the '081 Patent in an amount to be proved at trial.

COUNT IV
(Infringement of the '527 Patent)

47.   Paragraphs 1 through 19 are incorporated by reference as if fully set forth herein.

48.   ABT has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the '527 Patent.

49.   Defendant has and continues to directly infringe the '527 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '527 Patent. Such products include at least

Accused Products including, but not limited to, the OnePlus Nord, OnePlus Nord 2, OnePlus Nord

2 x Pac-Man Edition, OnePlus Nord CE 5G, OnePlus Nord LE, OnePlus Nord N10 5G, OnePlus

Nord N200 5G, OnePlus 9, OnePlus 9 Pro, OnePlus 9R, OnePlus 9RT, OnePlus 8, OnePlus 8 Pro,

OnePlus 8T, and the OnePlus 8T Cyberpunk 2077 Limited Edition which practice a method for

multi-antenna transmission in a user equipment, comprising: receiving a first radio signal from a

base station; and receiving a first signaling from the base station; wherein the first radio signal is

transmitted by K antenna port groups of the base station; the antenna port group includes a positive

integer number of antenna port(s); a first antenna port group is one of the K antenna port groups;

the first signaling is used to determine a first time resource pool; at least one of a first antenna

virtualization vector and a second antenna virtualization vector is associated with the first antenna

port group; the first antenna virtualization vector is an antenna virtualization vector available to

the base station in the first time resource pool; the second antenna virtualization vector is an

antenna virtualization vector available to the user equipment in the first time resource pool; and

the K is a positive integer greater than 1.

50.   For example, Defendant has and continues to directly infringe at least claim 1 of

the '527 Patent by making, using, offering to sell, selling, and/or importing into the United States

products that implement the 5G standards, such as the Accused Products (*e.g.*, 5G mobile handsets

and tablets). For example, the OnePlus 9 Pro operates on 5G and includes firmware for

implementing 3rd Generation Partnership Product (3GPP) specifications.

51.   The Accused Products perform a method for multi-antenna transmission in a user

equipment (such as the OnePlus 9 Pro), comprising: receiving a first radio signal (*e.g.*, KCSI-

RSresources and/or SS/PBCH blockresources) from a base station; and receiving a first signaling

(*e.g.*, a DCI format signal) from the base station; wherein the first radio signal is transmitted by K

antenna port groups (*e.g.*, ports in the KCSI-RSresources and/or SS/PBCH blockresources) of the base station; the antenna port group includes a positive integer number of antenna port(s); a first antenna port group (*e.g.*, ports in a CSI-RS resource or SS/PBCH block resource) is one of the K antenna port groups; the first signaling is used to determine a first time resource pool (*e.g.*, time domain resource occupied by a PDSCH,); at least one of a first antenna virtualization vector and a second antenna virtualization vector (*e.g.*, Rx or Tx antenna virtualization vector) is associated with the first antenna port group; the first antenna virtualization vector is an antenna virtualization vector available to the base station in the first time resource pool; the second antenna virtualization vector is an antenna virtualization vector available to the user equipment in the first time resource pool; and the K is a positive integer greater than 1.

52.   Defendant has and continues to indirectly infringe one or more claims of the '527 Patent by knowingly and intentionally inducing others, including OnePlus customers and end-users, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling, and/or importing into the United States products that include infringing technology, such as the Accused Products (*e.g.*, 5G mobile handsets and tablets).

53.   Defendant, with knowledge that these products, or the use thereof, infringes the '527 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '527 Patent by providing these products to end-users for use in an infringing manner.

54.   Defendant has induced infringement by others, including end-users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end-users, infringe the '527 Patent, but while remaining willfully blind to the infringement.

55.   ABT has suffered damages as a result of Defendant's direct and indirect infringement of the '527 Patent in an amount to be proved at trial.

COUNT V
(Infringement of the '271 Patent)

56.   Paragraphs 1 through 19 are incorporated by reference as if fully set forth herein.

57.   ABT has not licensed or otherwise authorized Defendant to make, use, offer for sale, sell, or import any products that embody the inventions of the '271 Patent.

58.   Defendant has and continues to directly infringe the '271 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '271 Patent. Such products include at least Accused Products including, but not limited to, the OnePlus Nord, OnePlus Nord 2, OnePlus Nord 2 x Pac-Man Edition, OnePlus Nord CE 5G, OnePlus Nord LE, OnePlus Nord N10 5G, OnePlus Nord N200 5G, OnePlus 9, OnePlus 9 Pro, OnePlus 9R, OnePlus 9RT, OnePlus 8, OnePlus 8 Pro, OnePlus 8T, and the OnePlus 8T Cyberpunk 2077 Limited Edition which practice a method for multi-antenna transmission in a user equipment (UE), comprising: receiving, by the UE, a first signaling originating from a base station; receiving, by the UE, a first wireless signal originating from the base station; and transmitting, by the UE, first information to the base station; wherein, K antenna port groups of the base station are used to transmit the first wireless signal; the first signaling is used by the UE to determine the K antenna port groups transmitting the first wireless signal received by the UE; the K is a positive integer greater than 1; the K antenna port groups respectively correspond to K channel quality values; the K channel quality values are K non-negative real numbers; the K channel quality values are Reference Signal Received Powers (RSRPs) or a Signal to Interference plus Noise Ratios (SINRs); K1 antenna port groups of the K

antenna port groups correspond to K1 channel quality values of the K channel quality values; the K1 is a positive integer less than or equal to the K; a first proportional sequence corresponds to a ratio (ratios) among the K1 channel quality values; the first information is used to determine the K1 antenna port groups and the first proportional sequence; the first signaling is used to determine a target threshold; the target threshold is a non-negative real number; a first channel quality is a best channel quality value among the K1 channel quality values; a second channel quality is a worse channel quality value among the K1 channel quality values; a ratio between the second channel quality and the first channel quality is greater than or equal to the target threshold.

59.   For example, Defendant has and continues to directly infringe at least claim 1 of the '271 Patent by making, using, offering to sell, selling, and/or importing into the United States products that implement the 5G standards, such as the Accused Products (*e.g.*, 5G mobile handsets and tablets). For example, the OnePlus 9 Pro operates on 5G and includes firmware for implementing 3rd Generation Partnership Product (3GPP) specifications).

60.   The Accused Products perform a method for multi-antenna transmission in a user equipment (UE, such as the OnePlus 9 Pro), comprising: receiving, by the UE, a first signaling (*e.g.*, CSI-ReportConfig IE or CSI-AperiodicTriggerStateList IE) originating from a base station; receiving, by the UE, a first wireless signal (*e.g.*, K CSI-RS resources and/or SS/PBCH block resources) originating from the base station; and transmitting, by the UE, first information (CSI report) to the base station; wherein, K antenna port groups (*e.g.*, ports in the K CSI-RS resources and/or SS/PBCH block resources) of the base station are used to transmit the first wireless signal; the first signaling is used by the UE to determine the K antenna port groups transmitting the first wireless signal received by the UE; the K is a positive integer greater than 1; the K antenna port groups respectively correspond to K channel quality values (*e.g.*, K L1-RSRPs corresponding to

K CSI-RS resources and/or SS/PBCH block resources); the K channel quality values are K non-negative real numbers; the K channel quality values are Reference Signal Received Powers (RSRPs) or a Signal to Interference plus Noise Ratios (SINRs); K1 (*e.g.*, nrofReportedRS) antenna port groups (*e.g.*, antenna port groups corresponding to nrofReportedRS CSI-RS resources and/or SS/PBCH block resources reported in a single CSI report) of the K antenna port groups correspond to K1 channel quality values (*e.g.*, nrofReportedRS L1-RSRPs corresponding to nrofReportedRS CSI-RS resources and/or SS/PBCH block resources reported in a single CSI report) of the K channel quality values; the K1 is a positive integer less than or equal to the K; a first proportional sequence (*e.g.*, the linear values of (nrofReportedRS-1) differential L1-RSRPs) corresponds to a ratio (ratios) among the K1 channel quality values; the first information is used to determine the K1 antenna port groups and the first proportional sequence; the first signaling is used to determine a target threshold (*e.g.*, the minimum value of the ratio between the worst one and the best one of the K1 L1-RSRPs); the target threshold is a non-negative real number; a first channel quality (*i.e.*, the best one of the nrofReporteedRS L1-RSRPs) is a best channel quality value among the K1 channel quality values; a second channel quality (one of the nrofReportedRS L1-RSRPs other than the best one of the nrofReportedRS L1-RSRPs) is a worse channel quality value among the K1 channel quality values; a ratio between the second channel quality and the first channel quality is greater than or equal to the target threshold.

61.   Defendant has and continues to indirectly infringe one or more claims of the '271 Patent by knowingly and intentionally inducing others, including OnePlus customers and end-users, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling, and/or importing into the United States products that include infringing technology, such as the Accused Products (*e.g.*, 5G mobile handsets and tablets).

62.   Defendant, with knowledge that these products, or the use thereof, infringes the '271 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '271 Patent by providing these products to end-users for use in an infringing manner.

63.   Defendant has induced infringement by others, including end-users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end-users, infringe the '271 Patent, but while remaining willfully blind to the infringement.

64.   ABT has suffered damages as a result of Defendant's direct and indirect infringement of the '271 Patent in an amount to be proved at trial.

DEMAND FOR JURY TRIAL

Plaintiff hereby demands a jury for all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, ABT prays for relief against Defendant as follows:

a.   Entry of judgment declaring that Defendant has directly and/or indirectly infringed one or more claims of each of the Patents-in-Suit;

b.   An order awarding damages sufficient to compensate ABT for Defendant's infringement of the Patents-in-Suit, but in no event less than a reasonable royalty, together with interest and costs;

c.   Entry of judgment declaring that this case is exceptional and awarding ABT its costs and reasonable attorney fees under 35 U.S.C. § 285; and,

d.   Such other and further relief as the Court deems just and proper.

Dated: February 1, 2022

Respectfully submitted,

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