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IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF CALIFORNIA

CYWEE GROUP LTD., *Plaintiff,* v. ZTE CORPORATION, ZTE (USA), INC., and ZTE (TX) INC., *Defendants.*	CASE NO. '17CV2130 GPC JMA CYWEE GROUP LTD'S ORIGINAL COMPLAINT FOR PATENT INFRINGEMENT DEMAND FOR JURY TRIAL

1. Plaintiff CyWee Group Ltd. ("Plaintiff" or "CyWee"), by and through its undersigned counsel, files this Original Complaint against Defendants ZTE Corporation, ZTE (USA), Inc., and ZTE (TX), Inc. (collectively "ZTE" or "Defendants") as follows:

THE PARTIES

2. CyWee is a corporation existing under the laws of the British Virgin Islands with a principal place of business at 3F, No.28, Lane 128, Jing Ye 1st Road, Taipei, Taiwan 10462.

3. CyWee is a world-leading technology company that focuses on building products and providing services for consumers and businesses. CyWee has one of the most significant patent portfolios in the industry and is a market leader in its core development areas of motion processing, wireless high definition video delivery, and facial tracking technology.

4. Defendant ZTE Corporation ("ZTE Corp.") is a Chinese corporation with a principal place of business located at ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen Prefecture, Guangdong Province, People's Republic of China 518057.

5. Defendant ZTE (USA), Inc. ("ZTEUSA") is a wholly-owned subsidiary of ZTE Corporation. ZTEUSA is formed under the laws of the State of New Jersey with its principal place of business in California at 6170 Cornerstone Court East, Ste.

270, San Diego, California 92121. ZTE (USA), Inc. may be served through its agent for service of process, Incorp Services, Inc., at 5716 Corsa Ave., Ste. 110, Westlake Village, California 91362.

6. On information and belief, Defendant ZTE (TX), Inc. ("ZTETX") is a wholly-owned subsidiary of ZTE Corporation. ZTETX is a corporation organized and existing under the laws of the State of Texas with its principal place of business in California at 1900 McCarthy Boulevard, #420, Milpitas, California 95035 and may be served through its agent for service of process, Incorp Services, Inc., at 5716 Corsa Ave., Ste. 110, Westlake Village, California 91362.

JURISDICTION AND VENUE

7. This action arises under the patent laws of the United States, 35 U.S.C. § 1 *et seq*. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

8. This Court has personal jurisdiction over each Defendant. Each Defendant has conducted and does conduct business within the State of California. Each Defendant has purposefully and voluntarily availed itself of the privileges of conducting business in the United States, in the State of California, and in the Southern District of California by continuously and systematically placing goods into the stream of commerce through an established distribution channel with the expectation that they will be purchased by consumers in the Southern District of California. ZTEUSA

has a principal place of business in San Diego, California, and ZTETX has one of its five main offices in San Diego, California. Both ZTETX and ZTEUSA are registered to do business in California and maintain agents for service of process there, as well as having authorized retailers for the accused products in this judicial district. Plaintiff's cause of action arises directly from Defendants' business contacts and other activities in the State of California and the Southern District of California.

9. Venue is proper as to ZTE Corp. under 28 U.S.C. § 1391(c)(3) in that it is not a resident of the United States and may, therefore, be sued in any judicial district. *Brunette Mach. Works, Ltd. v. Kockum Indus., Inc.*, 406 U.S. 706, 714 (1972).

10. Venue is proper as to ZTEUSA under 28 U.S.C. § 1400(b) because ZTEUSA has committed acts of infringement in this District and has a regular and established place of business within this District. *TC Heartland LLC v. Kraft Foods Grp. Brands LLC*, 137 S. Ct. 1514, 1521 (2017). Specifically, ZTEUSA attested that as part of its 2016 Statement of Information for its registration to do business in California that its principle place of business in California is located at 6170 Cornerstone Court East, Ste. 270, San Diego, California 92121, which is within this District.

11. Venue is proper as to ZTETX under 28 U.S.C. § 1400(b) because ZTETX has committed acts of infringement in this District and has a regular and established place of business within this District. *Id.* Specifically, on both the contact page and

locations page of its website, ZTETX list an office at 6170 Cornerstone Court East, Ste. 270, San Diego, California 92121, which is within this District, as one of its five offices in the U.S. *See* www.ztetx.com/about/zte_us_ltd/ (last visited Sept. 26, 2017); www.ztetx.com/others/contact/ (last visited Sept. 26, 2017).

12. Upon information and belief, each Defendant has committed acts of infringement in this District giving rise to this action and does business in this District, including making sales and/or providing service and support for their respective customers in this District. Defendants purposefully and voluntarily sold one or more of their infringing products with the expectation that they would be purchased by consumers in this District. These infringing products have been and continue to be purchased by consumers in this District. Defendants have committed acts of patent infringement within the United States, the State of California, and the Southern District of California.

BACKGROUND

Patentee And The Asserted Patents.

13. The Industrial Technology Research Institute ("ITRI") is a Taiwanese government- and industry-funded research and development center. In 2007, CyWee, which was started at ITRI, was formed. Its goal was to provide innovative motion-sensing technologies, such as those claimed in the patents-in-suit. Dr. Shun-Nan Liu and Chin-Lung Li, two of the inventors of the patents-in-suit, came to CyWee from

ITRI. The third inventor, Zhou "Joe" Ye joined CyWee from private industry as its President and served as CEO from 2006 to 2016.

14. The inventors, Zhou Ye, Chin-Lung Li, and Shun-Nan Liou, conceived of the claims of the patents-in-suit—U.S. Patent No. 8,441,438 (the "'438 patent") and U.S. Patent No. 8,552,978 (the "'978 patent")—at CyWee Group Ltd., located at 3F, No. 28, Lane 128, Jing Ye Road, Taipei.

15. Several claims of the patents-in-suit are entitled to a priority date of at least January 6, 2010 based on U.S. Provisional Application Serial No. 61/292,558, filed January 6, 2010 ("Provisional Application").

16. Before May 22, 2009, CyWee began working on the "JIL Game Phone Project" or "JIL Phone." Before July 29, 2009, CyWee developed a solution for the JIL Phone that practiced several claims of the '438 patent. Those claims were diligently and constructively reduced to practice thereafter through the filing of the Provisional Application and were diligently and actually reduced to practice as discussed below. Accordingly, CyWee is entitled to a priority date of at least July 29, 2009 for several claims of the '438 patent.

17. The JIL Phone was reduced to practice by at least September 25, 2009. The JIL Phone practiced several claims of both patents-in-suit. Accordingly, CyWee is entitled to a priority date of at least September 25, 2009 for several claims of the patents-in-suit.

<u>Background Of The Technology</u>.

18. The ’438 patent and ’978 patent are each directed to devices and methods for tracking the motion of a portable electronic device in 3D space and compensating for accumulated errors to map the 3D movements of the device onto a display frame (’438 patent) or transform the 3D movements for a display, such as a 2D display on a computer or handheld device (’978 patent). ’438 patent 1:17-52, 3:52-57; ’978 patent 1:22-27, 7:5-18; **<u>Exhibit C</u>**, Declaration of Nicholas Gans, Ph.D. (“Gans Decl.”) ¶ 8. At a high level, the patented inventions teach how to determine a device’s current orientation based on motion data detected by its motion sensors, such as an accelerometer, gyroscope, and magnetometer. ’438 patent 4:6-30; ’978 patent 4:15-44; Gans Decl. ¶ 8. The ’438 patent and ’978 patent describe portable electronic devices or pointing devices such as smartphones and navigation equipment. ’978 patent 22:34-40, Fig. 6; ’438 patent 4:6-30, Fig. 6; Gans. Decl. ¶ 8.

19. There are different types of motion sensors, including accelerometers, gyroscopes, and magnetometers. Gans Decl. ¶ 9. Accelerometers measure accelerations. *Id.* For example, airbags use accelerometers, such that the airbag is triggered based on sudden deceleration. Accelerometers can also measure forces due to gravity. *Id*. Gyroscopes measure rotation rates or angular velocities. Magnetometers measure magnetism, including the strength of a magnetic field along a particular direction. *Id.* Each type of motion sensor is subject to inaccuracies. *Id.* For example,

a gyroscope sensor has a small, added offset or bias. *Id.* This bias will accumulate over time and lead to large drift error. *Id.* Similarly, magnetometers are subject to interference from natural and manmade sources (e.g., power electronics). *Id.* Additionally, errors can accumulate over time. *Id.* These sensors typically take measurements along a single direction. *Id.* To accurately measure motions along an arbitrary axis, three like sensors are grouped together and aligned at right angles. Such a sensor set is generally referred to as a 3-axis sensor. *Id.*

20. Orientation information returned by the claimed inventions of the '438 patent and '978 patent has many uses, particularly for mobile cellular devices, such as navigation, gaming, and augmented/virtual reality applications. Gans Decl. ¶ 12. Navigation applications can use orientation information to determine the heading of the phone, indicate what direction the user is facing, and automatically orient the map to align with the cardinal directions. *Id.* Increasing numbers of games and other applications use the motion of the phone to input commands, such as tilting the mobile device like a steering wheel. *Id.* Augmented and virtual reality applications rely on accurate estimation of the device orientation in order to render graphics and images at the proper locations on the screen. *Id.*

21. Prior to 2010, motion sensors had limited applicability to portable electronic devices due to a variety of technological hurdles. Gans Decl. ¶ 13. For example, different types of acceleration (e.g., linear, centrifugal, gravitational) could

not be readily distinguished from one another, and rapid, dynamic, and unexpected movements caused significant errors and inaccuracies. *Id.* These difficulties were compounded by the miniaturization of the sensors necessary to incorporate them in portable electronic devices. *Id.* With the development of micro-electromechanical systems, or "MEMS," miniaturized motion sensors could be manufactured and incorporated on a semiconductor chip, but such MEMS sensors had significant limitations. *Id.*

22. For example, it is impossible for MEMS accelerometers to distinguish different types of acceleration (e.g., linear, centrifugal, gravitational). Gans Decl. ¶ 14. When a MEMS accelerometer is used to estimate orientation, it must measure force along the direction of gravity (i.e., down), but that gravitational measurement can be "interfused" with other accelerations and forces (e.g., vibration or movement by the person holding the device). *Id.* Thus, non-gravitational accelerations and forces must be estimated and subtracted from the MEMS accelerometer measurement to yield an accurate result. *Id.* A MEMS gyroscope is prone to drift, which will accumulate increasing errors over time if not corrected by another sensor or recalibrated. *Id.* A MEMS magnetometer is highly sensitive to not only the earth's magnetic fields, but other sources of magnetism (e.g., power lines and transformers) and can thereby suffer inaccuracies from environmental sources of interference that vary both in existence and intensity from location to location. *Id.*

23. Additionally, orientation cannot be accurately calculated using only one type of MEMS sensor. Gans Decl. ¶ 15. For example, if only a 3-axis MEMS accelerometer is used to measure orientation, pitch and yaw can be measured, but not roll. *Id.* If only a MEMS gyroscope is used to measure angular velocity, only relative changes in orientation can be measured, not absolute orientation. *Id.*

24. Without orientation information, mobile device apps would be limited to very static operation. Gans Decl. ¶ 16. This was the scenario with initial smart phones and other mobile devices. *Id.* Navigation aids could render a map and indicate the location of the device using GPS. *Id.* However, these maps would orient with North on the map pointing to the top of the screen. *Id.* The user could rotate the map using touch commands, but the map would not rotate automatically as the user turned. *Id.* Nor could the device indicate what direction the device was facing. *Id.*

25. Many games use motion of the device to control the game. Gans Decl. ¶ 17. A common control scheme, especially for driving and piloting games, is to have the user rotate the device, such as a phone or game controller, like a steering wheel to indicate the direction the vehicle should move. *Id.* Some puzzle games also use motions to cause elements of the game to move. *Id.* As discussed previously, accelerometers measure acceleration, which is a very noisy signal. *Id.* Acceleration is the derivative of velocity, which is the derivative of position. Id. Small magnitude noise can have large derivatives, which means that small levels of noise from vibration

or electrical fluctuations will be magnified at the acceleration level. *Id.* Even a stationary device will have notable noise measured by an accelerometer. *Id.* A moving device will only amplify this noise. *Id.* Since accelerometers measure linear and centripetal accelerations as well as the acceleration of gravity, orientation estimates on a moving device will not be accurate. *Id.*

26. If only an accelerometer is used, a coarse estimate of the device orientation can be obtained by averaging or numerically filtering the results. Gans Decl. ¶ 18. Essentially, the device can determine if it is tilted left or right, up or down, but the exact angle cannot be estimated accurately while in motion. *Id.* This is suitable for games to move a character or steer a vehicle in a particular direction, but generally cannot utilize the magnitude of tilt to move at corresponding faster or slower speeds. *Id.*

27. Movement on a display can, of course, be controlled by means other than a portable electronic device with orientation sensors. Gans Decl. ¶ 19. For example, games could be controlled using traditional "joystick" type inputs. *Id.* For smart phones with touch screens, commands are given by having the user touch specific parts of the screen. *Id.*

28. For other current applications, portable electronic devices with orientation sensors are more crucial. Gans Decl. ¶ 20. Augmented reality (AR) and virtual reality (VR) are new and growing classes of applications for smart phones and

mobile devices. *Id.* In AR, the device camera provides live video feed to the screen, and the application overlays generate graphics onto the screen at specific locations. *Id.* AR navigation apps can draw signs or labels to indicate what specific places or objects are, or can render arrows or other indicators. *Id.* AR games and teaching applications can label objects or draw characters or items such that they appear as if they are in the real world seen in the video. *Id.* Virtual reality is similar but does not use the camera, rather it completely renders an artificial 3D environment on the screen. *Id.* VR most often requires a head set such that the user only sees the screen. *Id.* Mobile devices and smart phones used for VR generally split the screen and display to two side-by-side images of the rendered environment that are slightly offset to simulate a left and right eye. *Id.* The device then sits in a headset with lenses such that the user has each eye see only one of the split-screen images and has a sense of stereo (3D) vision. *Id.*

29. Without orientation sensing, AR and VR applications cannot work. Gans Decl. ¶ 21. The system will have no ability to understand the orientation of the device and know where to draw objects and/or the scene. *Id.* The rough orientation estimate provided by an accelerometer (ideally with a magnetometer) will not be sufficient to track during typical head motions. *Id.* It has been demonstrated that VR applications that use an accelerometer often cause motion sickness, as the rendered images do track with the head motions. *Id.* An AR application with the use of a gyroscope and fusion

algorithm will not render objects at the correct locations, and may obscure the view rather than provide helpful information. *Id.*

30. There are ways to estimate orientation other than the approaches presented in the ’438 patent or ’978 patent, which involve algorithms that filter and fuse measurements from inertial and magnetic sensors. Gans Decl. ¶ 22. Most such methods are based on cameras and computer vision algorithms. *Id.* However, the limitations of these methods render them unusable for portable electronic devices. *Id.* For example, there are a variety of motion capture systems that use cameras arrayed around an environment. Markers (e.g., reflective balls) can be placed on objects, and the cameras can locate the markers, often to sub-mm accuracy. *Id.* If an object has three or more markers on it, the orientation of the object can be determined with sub-degree accuracy. *Id.* This method is very accurate, but quite expensive (often about $100,000). *Id.* The cameras are fixed in place, and the estimation can only work within a small space (a box of dimensions on the order of tens of meters). *Id.* This is not suitable for the vast majority of mobile device users or applications. *Id.*

31. A camera on a portable electronic device, such as a smart phone, can be used to estimate orientation of the phone. Gans Decl. ¶ 23. One class of approaches to this problem uses special patterns or markers in the environment. *Id.* These often have the appearance of a QR code or 2D UPC. *Id.* Taking a picture of the pattern, computer vision algorithms can determine the position and orientation of the camera with

respect to the marker. *Id.* AR applications have placed the patterns on specific objects or consumer products so the device can render images and graphics with respect to the pattern. *Id.* AR games have included patterned mats that are placed on a table or other flat surface, and the device renders characters and objects as if they were on the surface. *Id.*

32. Multiple unique patterns can be placed around an environment; so long as one is always in view, the camera can maintain an estimate of the orientation and position. Gans Decl. ¶ 24. In this way, it can be used for navigation. *Id.* The necessity of placing patterns would make this approach useless for a majority of applications, particularly outdoors. *Id.* The camera would also need to remain on at all times, which would cause severe battery drain. *Id.*

33. Orientation of the camera can also be estimated over an indefinite amount of time using vision algorithms known as visual odometry. Gans Decl. ¶ 25. In visual odometry, changes in the image over time are used to estimate the camera velocity. *Id.* This velocity can be integrated over time to estimate the change in orientation. While these methods are well understood, they can only track change in relative orientation, not give absolute orientation. *Id.* They also require the camera to be on at all times, which will greatly reduce battery life. *Id.*

The Prior Art.

34. As noted in both the ’438 patent and ’978 patent, prior art portable electronic devices, such as pointing devices, smartphones and navigation equipment, had several deficiencies in addressing the technological challenges of mapping and transforming movement in a 3D space to a 2D display. These prior art portable devices could only output the movement of the device in 2D, rather than the 3D reference frame of the ’438 and’978 patents. ’438 patent 2:47-55; ’978 patent 2:41-58. In addition, the portable devices could not accurately calculate and account for movements of the device in a dynamic environment, such as erroneous drift measurements of the device or accelerations along with the direction of gravity. ’438 patent 2:55-62; ’978 patent 2:58-66. These prior art portable devices were also limited to detecting gravitational acceleration detected by the accelerometer, and were therefore incapable of accurately outputting the actual yaw, pitch and roll angles. ’438 patent 2:62-3:5; ’978 patent 2:66-3:13. Finally, for the specific case of pointing devices, when they extended beyond the border or boundary of the display, the absolute movement pattern was not mapped, but instead the location outside the boundary was ignored and a relative movement pattern used, which resulted in uncompensated errors. ’438 patent 3:16-51; ’978 patent 3:20-52.

PATENT INFRINGEMENT OF U.S. PATENT NO. 8,441,438

35. Plaintiff repeats and re-alleges each and every allegation of paragraphs

1-34 as though fully set forth herein.

36. The ’438 patent, titled “3D Pointing Device and Method for Compensating Movement Thereof,” was duly and legally issued by the United States Patent and Trademark Office on May 14, 2013 to CyWee Group Limited, as assignee of named inventors Zhou Ye, Chin-Lung Li, and Shun-Nan Liou.

37. CyWee is the owner of all right, title, and interest in and to the ’438 patent with full right to bring suit to enforce the patent, including the right to recover for past infringement damages.

38. The ’438 patent claims, *inter alia*, a machine capable of detecting, measuring, and calculating the movements and rotations of the machine—utilizing, *inter alia*, a six-axis motion sensor module, a data transmitting unit, and a computing processor in one or more claimed configurations—and methods for measuring and calculating the movements and rotations of a device within a spatial reference frame.

39. The ’438 patent is directed to useful and novel particular embodiments and methods for detecting, measuring, and calculating motion within a spatial reference frame. *See* Gans. Decl. ¶ 27. Specifically, the ’438 patent claims a novel system involving multiple sensor types and a novel method for using those sensors to overcome the limitations of the individual sensor types in accurately determining the orientation of a device. *See id.* ¶¶ 26-28. The ’438 patent is not intended to, and does not claim every possible means of detecting, measuring, and calculating motion within

a spatial reference frame. There are alternative methods to determining orientation within a spatial reference frame, such as systems and methods utilizing computer vision algorithms and/or cameras. *See id.* ¶¶ 22-25, 33. The ’438 patent is directed to a technological solution to a technological problem. *Id.* ¶¶ 33-35. Accordingly, the ’438 patent is not directed to, and does not claim, the mere concept of motion sensing or of detecting, measuring, and calculating motion within a spatial reference frame. *Id.* ¶¶ 29-35.

40. Each and every claim of the ’438 patent is valid and enforceable and each enjoys a statutory presumption of validity separate, apart, and in addition to the statutory presumption of validity enjoyed by every other of its claims. 35 U.S.C. § 282.

41. CyWee is informed and believes, and thereupon alleges, that ZTE has been, and is currently, directly and/or indirectly infringing one or more claims of the ’438 patent in violation of 35 U.S.C. § 271, including as stated below.

42. CyWee is informed and believes, and thereupon alleges, that ZTE has directly infringed, literally and/or under the doctrine of equivalents, and will continue to directly infringe claims of the ’438 patent by making, using, selling, offering to sell, and/or importing into the United States products that embody or practice the apparatus and/or method covered by one or more claims of the ’438 patent including, but not limited to, Defendants’ following devices:

ZTE Axon 7

ZTE Axon 7 Mini

ZTE ZMax Pro

ZTE Blade Spark

43. The foregoing devices are collectively referred to as the "'438 Accused Products" and include the below specifications and features.

44. On information and belief, ZTE indirectly infringes the '438 patent by inducing others to infringe one or more claims of the '438 patent through sale and/or use of the '438 Accused Products. On information and belief, at least as a result of the filing of this action, ZTE is aware of the '438 patent; is aware that its actions with regards to distributors, resellers, and/or end users of the '438 Accused Products would induce infringement; and despite such awareness will continue to take active steps—

such as, creating and disseminating the ’438 Accused Products and product manuals, instructions, promotional and marketing materials, and/or technical materials to distributors, resellers, and end users—encouraging other’s infringement of the ’438 patent with the specific intent to induce such infringement.[1]

45. The ZTE Axon 7 includes a display screen.

46. The ZTE Axon 7 includes a housing.

47. The ZTE Axon 7 includes a 3-axis accelerometer.

48. The ZTE Axon 7 includes a 3-axis gyroscope.

49. The ZTE Axon 7 includes at least one printed circuit board (“PCB”).

50. The ZTE Axon 7 includes a 3-axis accelerometer attached to a PCB.

51. The ZTE Axon 7 includes a 3-axis gyroscope attached to a PCB.

52. The ZTE Axon 7 includes a 3-axis accelerometer that is capable of measuring accelerations.

53. The ZTE Axon 7 includes a 3-axis gyroscope that is capable of measuring rotation rates.

54. The ZTE Axon 7 runs an Android™ operating system.

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[1] To preempt any argument that such allegations are insufficient to establish a claim for induced infringement, CyWee respectfully notes that at least one Texas court previously held such allegations sufficient. *See, e.g.*, *ZTE Techs. Co. v. T-Mobile US, Inc.*, Case No. 2:16-cv-00052-JRG-RSP, 2017 WL 1129951, at *3 (E.D. Tex. Feb. 21, 2017) (“ZTE’s complaints adequately plead knowledge. ZTE alleges that T-Mobile knew of the asserted patents ‘since at least the filing of this action.’”).

55. The ZTE Axon 7 includes a 3-axis accelerometer that is capable of measuring accelerations using a "Sensor Coordinate System" as described in the Android™ developer library. *See* https://developer.android.com/guide/topics/sensors/sensors_overview.html (describing "Sensor Coordinate System").

56. The ZTE Axon 7 includes a 3-axis gyroscope that is capable of measuring rotation rates using a "Sensor Coordinate System."

57. The ZTE Axon 7 includes a processor that is capable of processing data associated with measurement from a 3-axis accelerometer.

58. The ZTE Axon 7 includes a processor that is capable of processing data associated with measurement from a 3-axis gyroscope.

59. The Android™ operating system that runs on the ZTE Axon 7 uses the measurement from a 3-axis accelerometer included in the device.

60. The Android™ operating system that runs on the ZTE Axon 7 uses the measurement from a 3-axis gyroscope included in the device.

61. The Android™ operating system that runs on the ZTE Axon 7 uses the measurement from a 3-axis accelerometer and the measurement from a 3-axis gyroscope to calculate an attitude of the device.

62. The ZTE Axon 7 Mini includes a display screen.

63. The ZTE Axon 7 Mini includes a housing.

64. The ZTE Axon 7 Mini includes a 3-axis accelerometer.

65. The ZTE Axon 7 Mini includes a 3-axis gyroscope.

66. The ZTE Axon 7 Mini includes at least one PCB.

67. The ZTE Axon 7 Mini includes a 3-axis accelerometer attached to a PCB.

68. The ZTE Axon 7 Mini includes a 3-axis gyroscope attached to a PCB.

69. The ZTE Axon 7 Mini includes a 3-axis accelerometer that is capable of measuring accelerations.

70. The ZTE Axon 7 Mini includes a 3-axis gyroscope that is capable of measuring rotation rates.

71. The ZTE Axon 7 Mini runs an Android™ operating system.

72. The ZTE Axon 7 Mini includes a 3-axis accelerometer that is capable of measuring accelerations using a "Sensor Coordinate System" as described in the Android™ developer library. *See* https://developer.android.com/guide/topics/sensors/sensors_overview.html (describing "Sensor Coordinate System").

73. The ZTE Axon 7 Mini includes a 3-axis gyroscope that is capable of measuring rotation rates using a "Sensor Coordinate System."

74. The ZTE Axon 7 Mini includes a processor that is capable of processing data associated with measurement from a 3-axis accelerometer.

75. The ZTE Axon 7 Mini includes a processor that is capable of processing data associated with measurement from a 3-axis gyroscope.

76. The Android™ operating system that runs on the ZTE Axon 7 Mini uses

the measurement from a 3-axis accelerometer included in the device.

77. The Android™ operating system that runs on the ZTE Axon 7 Mini uses the measurement from a 3-axis gyroscope included in the device.

78. The Android™ operating system that runs on the ZTE Axon 7 Mini uses the measurement from a 3-axis accelerometer and the measurement from a 3-axis gyroscope to calculate an attitude of the device.

79. The ZTE ZMax Pro includes a display screen.

80. The ZTE ZMax Pro includes a housing.

81. The ZTE ZMax Pro includes a 3-axis accelerometer.

82. The ZTE ZMax Pro includes a 3-axis gyroscope.

83. The ZTE ZMax Pro includes at least one PCB.

84. The ZTE ZMax Pro includes a 3-axis accelerometer attached to a PCB.

85. The ZTE ZMax Pro includes a 3-axis gyroscope attached to a PCB.

86. The ZTE ZMax Pro includes a 3-axis accelerometer that is capable of measuring accelerations.

87. The ZTE ZMax Pro includes a 3-axis gyroscope that is capable of measuring rotation rates.

88. The ZTE ZMax Pro runs an Android™ operating system.

89. The ZTE ZMax Pro includes a 3-axis accelerometer that is capable of measuring accelerations using a “Sensor Coordinate System” as described in the

Android™ developer library. *See* https://developer.android.com/guide/topics/sensors/sensors_overview.html (describing "Sensor Coordinate System").

90. The ZTE ZMax Pro includes a 3-axis gyroscope that is capable of measuring rotation rates using a "Sensor Coordinate System."

91. The ZTE ZMax Pro includes a processor that is capable of processing data associated with measurement from a 3-axis accelerometer.

92. The ZTE ZMax Pro includes a processor that is capable of processing data associated with measurement from a 3-axis gyroscope.

93. The Android™ operating system that runs on the ZTE ZMax Pro uses the measurement from a 3-axis accelerometer included in the device.

94. The Android™ operating system that runs on the ZTE ZMax Pro uses the measurement from a 3-axis gyroscope included in the device.

95. The Android™ operating system that runs on the ZTE ZMax Pro uses the measurement from a 3-axis accelerometer and the measurement from a 3-axis gyroscope to calculate an attitude of the device.

96. The ZTE Blade Spark includes a display screen.

97. The ZTE Blade Spark includes a housing.

98. The ZTE Blade Spark includes a 3-axis accelerometer.

99. The ZTE Blade Spark includes a 3-axis gyroscope.

100. The ZTE Blade Spark includes at least one PCB.

101. The ZTE Blade Spark includes a 3-axis accelerometer attached to a PCB.

102. The ZTE Blade Spark includes a 3-axis gyroscope attached to a PCB.

103. The ZTE Blade Spark includes a 3-axis accelerometer that is capable of measuring accelerations.

104. The ZTE Blade Spark includes a 3-axis gyroscope that is capable of measuring rotation rates.

105. The ZTE Blade Spark runs an Android™ operating system.

106. The ZTE Blade Spark includes a 3-axis accelerometer that is capable of measuring accelerations using a "Sensor Coordinate System" as described in the Android™ developer library. *See* https://developer.android.com/guide/topics/sensors/sensors_overview.html (describing "Sensor Coordinate System").

107. The ZTE Blade Spark includes a 3-axis gyroscope that is capable of measuring rotation rates using a "Sensor Coordinate System."

108. The ZTE Blade Spark includes a processor that is capable of processing data associated with measurement from a 3-axis accelerometer.

109. The ZTE Blade Spark includes a processor that is capable of processing data associated with measurement from a 3-axis gyroscope.

110. The Android™ operating system that runs on the ZTE Blade Spark uses the measurement from a 3-axis accelerometer included in the device.

111. The Android™ operating system that runs on the ZTE Blade Spark uses

the measurement from a 3-axis gyroscope included in the device.

112. The Android™ operating system that runs on the ZTE Blade Spark uses the measurement from a 3-axis accelerometer and the measurement from a 3-axis gyroscope to calculate an attitude of the device.

113. CyWee adopts, and incorporates by reference, as if fully stated herein, the attached claim chart for claim 14 of the '438 patent, which is attached hereto as **Exhibit A**. The claim chart describes and demonstrates how ZTE infringes the '438 patent. In addition, CyWee alleges that ZTE infringes one or more additional claims of the '438 patent in a similar manner.

114. Defendants' acts of infringement have caused and will continue to cause substantial and irreparable damage to CyWee.

115. As a result of Defendants' infringement of the '438 patent, CyWee has been damaged. CyWee is, therefore, entitled to damages pursuant to 35 U.S.C. § 284 in an amount that presently cannot be pled but that will be determined at trial.

PATENT INFRINGEMENT OF U.S. PATENT NO. 8,552,978

116. Plaintiff repeats and re-alleges each and every allegation of paragraphs 1-115 as though fully set forth herein.

117. The '978 patent, titled "3D Pointing Device and Method for Compensating Rotations of the 3D Pointing Device Thereof," was duly and legally issued by the United States Patent and Trademark Office on October 8, 2013 to

CyWee Group Limited, as assignee of named inventors Zhou Ye, Chin-Lung Li, and Shun-Nan Liou.

118. CyWee is the owner of all right, title, and interest in and to the ’978 patent with full right to bring suit to enforce the patent, including the right to recover for past infringement damages.

119. The ’978 patent claims, *inter alia*, a machine capable of detecting, measuring, and calculating the movements and rotations of the machine—utilizing, *inter alia*, a nine-axes motion sensor module and two computing processors in one or more claimed configurations—and methods for measuring and calculating the movements and rotations of a device within a spatial reference frame. *See, generally*, Gans Decl.¶¶ 8-12.

120. The ’978 patent is directed to useful and novel particular embodiments and methods for detecting, measuring, and calculating motion within a spatial reference frame. *Id.* ¶ 27. Specifically, the ’978 patent claims a novel system involving multiple sensor types and a novel method for using those sensors to overcome the limitations of the individual sensor types in accurately determining the orientation of a device. *See id.* ¶¶ 26-28. The ’978 patent is not intended to, and does not claim every possible means of detecting, measuring, and calculating motion within a spatial reference frame. There are alternative methods to determining orientation within a spatial reference frame, such as systems and methods utilizing computer vision

algorithms and/or cameras. *See id.* ¶¶ 22-25, 33. The ’978 patent is directed to a technological solution to a technological problem. *Id.* ¶¶ 33-35. Accordingly, the ’978 patent is not directed to, and does not claim, the mere concept of motion sensing or of detecting, measuring, and calculating motion within a spatial reference frame. *Id.* ¶¶ 29-35.

121. Each and every claim of the ’978 patent is valid and enforceable and each enjoys a statutory presumption of validity separate, apart, and in addition to the statutory presumption of validity enjoyed by every other of its claims. 35 U.S.C. § 282.

122. CyWee is informed and believes, and thereupon alleges, that ZTE has been, and is currently, directly and/or indirectly infringing one or more claims of the ’978 patent in violation of 35 U.S.C. § 271, including as stated below.

123. CyWee is informed and believes, and thereupon alleges, that ZTE has directly infringed, literally and/or under the doctrine of equivalents, and will continue to directly infringe claims of the ’978 patent by making, using, selling, offering to sell, and/or importing into the United States products that embody or practice the apparatus and/or method covered by one or more claims of the ’978 patent including, but not limited to, Defendants’ following devices:

ZTE Axon 7

ZTE Axon 7 Mini

ZTE ZMax Pro

ZTE Blade Spark

124. The foregoing devices are collectively referred to as the "'978 Accused Products" and include the following specifications and features.

125. On information and belief, ZTE indirectly infringes the '978 patent by inducing others to infringe one or more claims of the '978 patent through sale and/or use of the '978 Accused Products. On information and belief, at least as a result of the filing of this action, ZTE is aware of the '978 patent; is aware that its actions with regards to distributors, resellers, and/or end users of the '978 Accused Products would induce infringement; and despite such awareness will continue to take, active steps—

such as, creating and disseminating the ’978 Accused Products, and product manuals, instructions, promotional and marketing materials, and/or technical materials to distributors, resellers, and end users—encouraging other’s infringement of the ’978 patent with the specific intent to induce such infringement.

126. The ZTE Axon 7 includes a 3-axis geomagnetic sensor.

127. The ZTE Axon 7 includes a 3-axis geomagnetic sensor that is capable of measuring a geomagnetic field.

128. The ZTE Axon 7 includes a 3-axis geomagnetic field sensor to measure a geomagnetic field using a “Sensor Coordinate System.” *See* https://developer.android.com/guide/topics/sensors/sensors_overview.html (describing “Sensor Coordinate System”).

129. The Android operating system that runs on the ZTE Axon 7 uses the measurement from a 3-axis geomagnetic sensor included in the device.

130. The Android operating system that runs on the ZTE Axon 7 uses the measurement from a 3-axis accelerometer, the measurement from a 3-axis geomagnetic field sensor, and the measurement from a 3-axis gyroscope to calculate an attitude of the device.

131. The Android operating system that runs on the ZTE Axon 7 uses the measurement from a 3-axis accelerometer, the measurement from a 3-axis geomagnetic field sensor, and the measurement from a 3-axis gyroscope to calculate

an attitude of the device that can be represented by an azimuth angle, a pitch angle, and a roll angle.

132. The ZTE Axon 7 has the ability to directly control apps by moving or rotating the device (for example, racing game apps).

133. The ZTE Axon 7 has the ability to run apps that can provide information based on the direction your device is facing, such as a map or navigation app.

134. The ZTE Axon 7 Mini includes a 3-axis geomagnetic sensor.

135. The ZTE Axon 7 Mini includes a 3-axis geomagnetic sensor that is capable of measuring a geomagnetic field.

136. The ZTE Axon 7 Mini includes a 3-axis geomagnetic field sensor to measure a geomagnetic field using a "Sensor Coordinate System." *See* https://developer.android.com/guide/topics/sensors/sensors_overview.html (describing "Sensor Coordinate System").

137. The Android operating system that runs on the ZTE Axon 7 Mini uses the measurement from a 3-axis geomagnetic sensor included in the device.

138. The Android operating system that runs on the ZTE Axon 7 Mini uses the measurement from a 3-axis accelerometer, the measurement from a 3-axis geomagnetic field sensor, and the measurement from a 3-axis gyroscope to calculate an attitude of the device.

139. The Android operating system that runs on the ZTE Axon 7 Mini uses

the measurement from a 3-axis accelerometer, the measurement from a 3-axis geomagnetic field sensor, and the measurement from a 3-axis gyroscope to calculate an attitude of the device that can be represented by an azimuth angle, a pitch angle, and a roll angle.

140. The ZTE Axon 7 Mini has the ability to directly control apps by moving or rotating the device (for example, racing game apps).

141. The ZTE Axon 7 Mini has the ability to run apps that can provide information based on the direction your device is facing, such as a map or navigation app.

142. The ZTE ZMax Pro includes a 3-axis geomagnetic sensor.

143. The ZTE ZMax Pro includes a 3-axis geomagnetic sensor that is capable of measuring a geomagnetic field.

144. The ZTE ZMax Pro includes a 3-axis geomagnetic field sensor to measure a geomagnetic field using a "Sensor Coordinate System." *See* https://developer.android.com/guide/topics/sensors/sensors_overview.html (describing "Sensor Coordinate System").

145. The Android operating system that runs on the ZTE ZMax Pro uses the measurement from a 3-axis geomagnetic sensor included in the device.

146. The Android operating system that runs on the ZTE ZMax Pro uses the measurement from a 3-axis accelerometer, the measurement from a 3-axis

geomagnetic field sensor, and the measurement from a 3-axis gyroscope to calculate an attitude of the device.

147. The Android operating system that runs on the ZTE ZMax Pro uses the measurement from a 3-axis accelerometer, the measurement from a 3-axis geomagnetic field sensor, and the measurement from a 3-axis gyroscope to calculate an attitude of the device that can be represented by an azimuth angle, a pitch angle, and a roll angle.

148. The ZTE ZMax Pro has the ability to directly control apps by moving or rotating the device (for example, racing game apps).

149. The ZTE ZMax Pro has the ability to run apps that can provide information based on the direction your device is facing, such as a map or navigation app.

150. The ZTE Blade Spark includes a 3-axis geomagnetic sensor.

151. The ZTE Blade Spark includes a 3-axis geomagnetic sensor that is capable of measuring a geomagnetic field.

152. The ZTE Blade Spark includes a 3-axis geomagnetic field sensor to measure a geomagnetic field using a "Sensor Coordinate System." *See* https://developer.android.com/guide/topics/sensors/sensors_overview.html (describing "Sensor Coordinate System").

153. The Android operating system that runs on the ZTE Blade Spark uses the

measurement from a 3-axis geomagnetic sensor included in the device.

154. The Android operating system that runs on the ZTE Blade Spark uses the measurement from a 3-axis accelerometer, the measurement from a 3-axis geomagnetic field sensor, and the measurement from a 3-axis gyroscope to calculate an attitude of the device.

155. The Android operating system that runs on the ZTE Blade Spark uses the measurement from a 3-axis accelerometer, the measurement from a 3-axis geomagnetic field sensor, and the measurement from a 3-axis gyroscope to calculate an attitude of the device that can be represented by an azimuth angle, a pitch angle, and a roll angle.

156. The ZTE Blade Spark has the ability to directly control apps by moving or rotating the device (for example, racing game apps).

157. The ZTE Blade Spark has the ability to run apps that can provide information based on the direction your device is facing, such as a map or navigation app.

158. CyWee adopts, and incorporates by reference, as if fully stated herein, the attached claim chart for claim 10 of the ’978 patent, which is attached hereto as **Exhibit B**. The claim chart describes and demonstrates how ZTE infringes the ’978 patent. In addition, CyWee alleges that ZTE infringes one or more additional claims of the ’978 patent in a similar manner.

159. Defendants' acts of infringement have caused and will continue to cause substantial and irreparable damage to CyWee.

160. As a result of Defendants' infringement of the '978 patent, CyWee has been damaged. CyWee is, therefore, entitled to damages pursuant to 35 U.S.C. § 284 in an amount that presently cannot be pled but that will be determined at trial.

PRAYER FOR RELIEF

WHEREFORE, PREMISES CONSIDERED, Plaintiff prays for entry of judgment against Defendants as follows:

A. A judgment that Defendants have infringed and continue to infringe the '438 patent and '978 patent, directly and/or indirectly, as alleged herein;

B. That Defendants provide to CyWee an accounting of all gains, profits, and advantages derived by Defendants' infringement of the '438 patent and '978 patent, and that CyWee be awarded damages adequate to compensate them for the wrongful infringement by Defendants, in accordance with 35 U.S.C. § 284;

C. That CyWee be awarded any other supplemental damages and interest on all damages, including, but not limited to, attorneys' fees available under 35 U.S.C. § 285;

D. That the Court permanently enjoin Defendants and all those in privity with Defendants from making, having made, selling, offering for sale, distributing, and/or using products that infringe the ’438 patent and ’978 patent, including the ’438 Accused Products and/or ’978 Accused Products, in the United States; and

E. That CyWee be awarded such other and further relief and all remedies available at law.

DEMAND FOR JURY TRIAL

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

Dated: October 17, 2017

Respectfully submitted,
/s/ Kent M. Walker
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(**Pro hac vice* applications to be filed)

Attorneys for Plaintiff CyWee Group Ltd.

TABLE OF CONTENTS – EXHIBITS TO COMPLAINT

Exhibit A. Exemplar claim chart showing infringement for claim 14 of U.S. Patent No. 8,441,438

Exhibit B. Exemplar claim chart showing infringement for claim 10 of U.S. Patent No. 8,552,978

Exhibit C. Declaration of Nicholas Gans, Ph.D.