IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

BIG WILL ENTERPRISES INC. Plaintiff, v. SHENZHEN VIOFO TECHNOLOGY CO., LTD. Defendant.	Civil Action File No.: 1:24-CV-01393 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Big Will Enterprises Inc. ("BWE" or "Plaintiff") in British Columbia, by and through their undersigned attorneys, files this Complaint against Shenzhen Viofo Technology Co., Ltd. ("Viofo" or "Defendant") and alleges, based on its own knowledge with respect to itself and its own actions and based on information and belief as to all other matters, as follows:

INTRODUCTION

1.

This is an action for patent infringement arising under the patent laws of the United States, Title 35, United States Code to enjoin infringement and obtain damages from Defendant's unauthorized manufacture, use, sale, offer to sell, and/or importation into the United States for the subsequent use or sale of products or methods that infringe one or more claims of United States Patents: 10,521,846 ("the '846 Patent"); 9,049,558 ("the '558 Patent"); 8,737,951 ("the '951 Patent"); 8,559,914 ("the '914 Patent"); and 8,452,273 ("the '273 Patent").

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2.

BWE is an innovative company in sensor technology for determining human activities for

health, safety and other uses. BWE's sensor-based technologies go beyond determining simple

human locations and offer smartphone users (and other communication-based devices) a personal

surveillance system based on their activities. The technologies monitor sensors such as the

accelerometer, the gyroscope and others for uniquely identifying human activities; the motion

activities can include, for example, but not limited to, standing/stationary, walking, running,

driving, skiing, sleeping, snoring, hiking, skateboarding, sky diving, bicycling, unicycling, golfing,

falling down, swimming, riding a ski lift, a motor vehicle, a motorcycle, an airplane, a train, or a

water vessel, accelerating or decelerating in a motor vehicle, motorcycle, train, airplane, or water

vessel, vibrating, propagating through a medium, rotating, riding in a wheelchair, and other human

movements, where capturing data and/or providing feedback is desired. BWE has created

proprietary technologies in this field of technology since at least 2007 for, among other benefits,

the increased health, safety, and well-being of its users. BWE's patented technology was

developed for use on a wide variety of devices, including smartphones, smartwatches, and other

communication and sensor-based devices in use on many popular products in the market today. In

addition to licensing, BWE has incorporated its patented technology in its own test platforms for

determining human activities, motions within activities, accidents, and falls, among others.

3.

BWE's sensor monitoring, processing and communication technology is covered by the

claims of the '846, '558, '951, '914, and the '273 patents asserted in this action, as well as other

BWE patents.

JURISDICTION AND VENUE

4.

BWE is a British Columbia company, incorporated in Canada having its principal place of business at 4573 West 1st Avenue, Vancouver, British Columbia V6R 1H7, Canada.

5.

Upon information and belief, Shenzhen Viofo Technology Co., Ltd. is a Limited Company organized under the laws of the People's Republic of China, whose headquarters is located at East of F3, Factory Bldg. No1, Huihuayuan No. 69 of Donghuan 2 Rd., Longhua St., Longhua, Province of Shenzhen, China 518000. Viofo may be served this Complaint by service in accordance with the Convention of 15 November 1965 on the Service Abroad of Judicial and Extrajudicial Documents in Civil or Commercial Matters ("The Hague Service Convention"). Fed. R. Civ. P. 4(h)(2).

6.

This is an action for infringement of a United States patent arising under 35 U.S.C. §§ 271, 281, and 284-285, among others. This Court has subject matter jurisdiction over all causes of action set forth herein pursuant to 28 U.S.C. §§ 1331 and 1338(a) because this action arises under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq.*

7.

Venue is proper in this judicial district and division pursuant to 28 U.S.C. §1391(c)(3) in that Defendant is not resident in the United States. Defendant routinely does business within this district, Defendant has committed acts of infringement within this district, and Defendant continues to commit acts of infringement within this district.

8.

On various e-commerce platforms, including Amazon.com, eBay.com, Walmart.com, and others, Viofo' s dashcam products are offered for sale and sold to customers residing in this State and District. Defendant Viofo also provides an online presence under the domain Viofo.com, which is available to customers and prospective customers within this State and District. As a result of Viofo' s business activities in this State and District, Viofo has had continuous and systematic contacts with this State and District.

9.

Upon information and belief, Defendant is subject to this Court's specific and general personal jurisdiction pursuant to due process and/or the Texas Long Arm Statute, due at least to Defendant's substantial business in this State and judicial district, including: (i) at least a portion of the infringements alleged herein; and/or (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct, and/or deriving substantial revenue from goods and services provided to individuals in Texas and in this district.

ALLEGATIONS COMMON TO ALL COUNTS

10.

Plaintiff ("BWE") owns all right, title, interest in, and has standing to sue for infringement the following patents: United States Patent No. 10,521,846, entitled "Targeted advertisement selection for a wireless communication device (WCD)", issued on December 31, 2019; United States Patent No. 9,049,558, entitled "Systems and methods for determining mobile thing motion activity (MTMA) using sensor data of wireless communication device (WCD) and initiating activity-based actions," issued on June 02, 2015; United States Patent No. 8,737,951, entitled "Interactive personal surveillance and security (IPSS) systems and methods," issued on May 27, 2014; United States Patent No. 8,559,914, entitled "Interactive personal surveillance and security

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(IPSS) systems and methods," issued on October 15, 2013; and United States Patent No. 8,452,273, entitled "Systems and methods for determining mobile thing motion activity (MTMA) using accelerometer of wireless communication device," issued May 28, 2013. Copies of the '846 Patent, the '558 Patent, the '951 Patent, the '914 Patent and the '273 Patent are attached as Exhibits 1-5.

11.

BWE is a global leader and innovator in the field of sensor technology for determining human activities for health, safety and other uses. These proprietary technologies and innovations have been developed since 2007 for the increased health, safety and well-being of its users. BWE patented technology was developed for use on a wide variety of devices, including smartphones and wearables, and is in use on many popular products in the market today. In addition to licensing, BWE has incorporated its patented technology in its own test platforms for determining human activities, motions within activities, accidents, and falls, among others.

12.

BWE's sensor-based technologies go beyond determining human locations by uniquely identifying human activities for automatically monitoring and tracking movements, such as (a) the user travel method (e.g., car, bus, motorcycle, bike, snow skiing, skateboarding, bicycling, water vessel, airplane, train, swimming, etc.) and/or (b) the user motions (standing/stationary, walking, running, driving, skiing, sleeping, snoring, hiking, accelerating or decelerating in a motor vehicle, vibrating, propagating through a medium, rotating, riding in a wheelchair, looking or not looking or looking at an angle at a WCD display, assuming a position relative to the WCD, et cetera) and other human movements where capturing data and/or providing feedback is desired.

13.

BWE's sensor monitoring, processing and communication technologies are covered by the claims of the '846 patent, the '558 patent, the '951 patent, the '914 patent, and the '273 patent which are asserted in this action, as well as other BWE patents.

14.

Defendant is Chinese technology company in the business of designing, manufacturing, and supplying on a world-wide basis various commercial and consumer goods and services. In particular, Defendants sold, offered for sale and imported into the United States, and continue to sell, offer for sale, and import into the United States, various dash cam models that employ telematics solutions that infringe BWE patents.

15.

These dash cams are wireless communication devices (WCDs) that, in addition to capturing video images, enhance driver safety, reduce accidents, and decrease insurance claims. These devices, equipped with memory, processors, and co-processors, play a crucial role in evaluating and reporting multiple facets of driving behavior, including fast accelerations, hard braking and aggressive cornering (steering), accidents and distracted driving. By monitoring accelerometer and gyroscope data, user behaviors while driving can be analyzed, determined and reported.

16.

Viofo offers advanced driver tracking devices that utilize telecommunications, real-time vehicle monitoring, and driver behavior analytics to enhance personal and or fleet safety and operational efficiency.   These devices are powered by sensor technologies, including accelerometers and other sensors, to continuously monitor and assess driver actions. Viofo's product lineup includes A-Model Dash Cams (e.g., A319, A229 plus/pro, A119 mini's, VS1, A119

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v3/plus/pro, WM1 and A139 with 1, 2 and or 3 channel options/versions), which integrate advanced mobile computing technologies such as wireless communication, GPS, and tri-axial accelerometers to detect critical driving behaviors.   These systems enable the real-time identification of unsafe driving events and identified by harsh braking, rapid acceleration, and impacts/accidents.
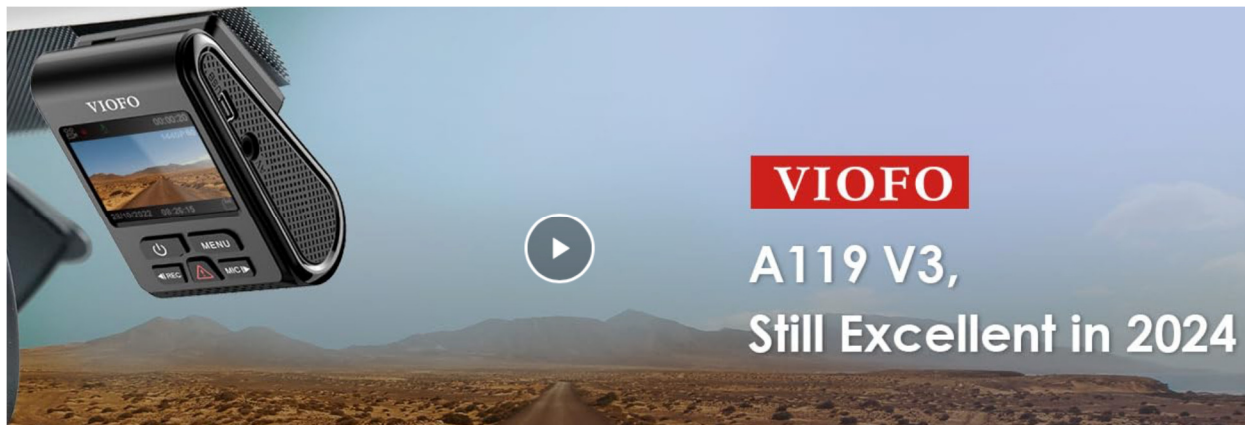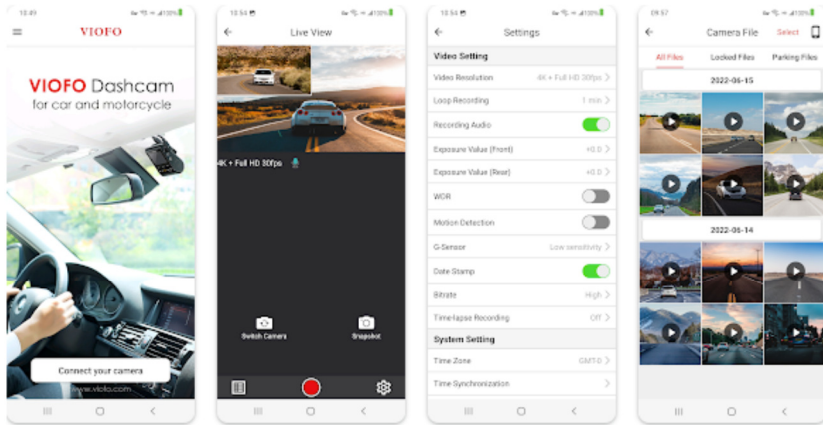

> The Viofo A119 V3 dash cam is equipped with a built-in G-sensor that functions as an accelerometer, allowing it to detect various driving behaviors, including hard braking, rapid acceleration, and accidents. This feature is crucial for enhancing driver safety and providing important video evidence in case of incidents.
>
> The G-sensor in the A119 V3 can be set to different sensitivity levels, enabling it to monitor and respond to sudden movements effectively. When a significant impact or collision is detected, the dash cam automatically locks the recorded footage, ensuring that critical evidence is preserved. This functionality is especially beneficial during accidents, as it captures events surrounding the incident, providing conteA129 and A118 for insurance claims or legal matters.
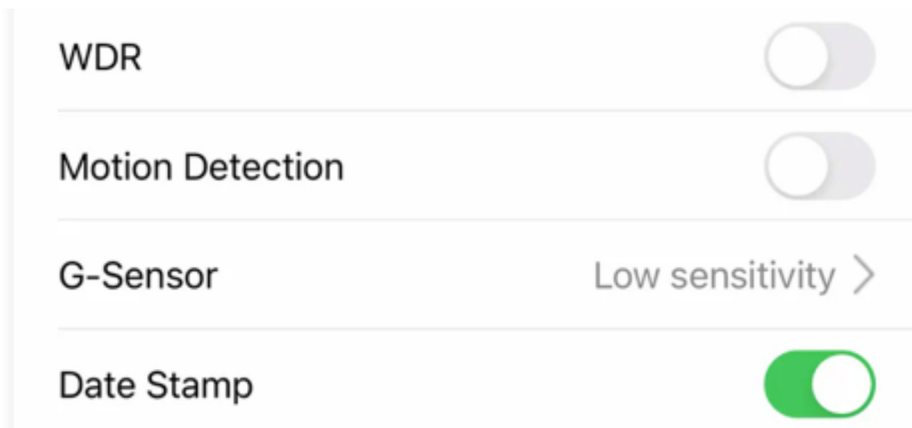
https://hiddengearhub.com/viofo-a119-v3-review/.

https://thedashcamdigest.com/viofo-a119-v3-2kdash-cam-review.

About this app →

With VIOFO Car Dash Camera App, is easy to control your VIOFO Dash cameras and get full remote control of all camera functions.

https://www.walmart.com/ip/VIOFO-A129-Plus-Duo-Dashcam-Front-and-Rear-2K-1440P-60FPS-1080P-30FPS-GPS-Wi-Fi-Parking-Mode/730691089.

The Viofo A129 Plus dash cam is equipped with advanced G-sensor technology, which functions as an accelerometer to detect various driving behaviors, including hard braking, rapid acceleration, and collisions. This feature is crucial for enhancing road safety and capturing essential video evidence during incidents. When a collision is detected, the dash cam automatically locks the recorded footage, ensuring that critical evidence is preserved. This feature is especially beneficial for drivers who want to ensure they have video documentation of any incidents, which can be vital for insurance claims and legal matters.

VIOFO Dual Dash Cam, 2K 1440P 60fps+1080P 30fps Front and Rear Dash Camera with Wi-Fi GPS, Parking Mode, Emergency Recording, Super Capacitor, Motion Detection (A129 Plus Duo)

Visit the VIOFO Store

4.2 ★★★★☆ ∨   2,771 ratings | Search this page

This item cannot be shipped to your selected delivery location. Please choose a different delivery location.

Brand	VIOFO
Model Name	A129 Plus Duo
Orientation	Drivers Side
Vehicle Service Type	Car
Connectivity Technology	Bluetooth
Special Feature	Built-In GPS

∨ See more

About this item

- 【2K 60fps+1080P 30fps Dual Dash Cam】A129 Plus Duo dash cam is the upgraded version of A129 Duo, front and rear dash camera shots road ahead at 2560*1440P 60fps and road behind at 1080P 30fps at the same time. Much more details can be easily captured including license plate and signpost. 140° wide angle is enough to cover the whole road and will not distort the image.
- 【HDR & Super Night Vision】Both front and rear cameras are

Roll over image to zoom in

The Viofo A119 Plus Duo dash cam is equipped with a built-in G-sensor that functions as an accelerometer to monitor driving behaviors, including hard braking, rapid acceleration, and collisions. This feature is essential for enhancing driver safety and capturing important video evidence during incidents.

When the G-sensor detects significant movement, such as a collision, the dash cam automatically locks the recorded footage to prevent it from being overwritten, ensuring that crucial evidence is preserved.

| VIOFO A329 1CH Front 4K 60FPS GPS Wi-Fi 6 Dash Cam HDR wit... | VIOFO A329 2CH First 4K 60FPS Front and 2K Rear Wi-Fi 6 Das... | VIOFO A229 PRO 2CH Front and Rear 4K+2K HDR Dual Dash Ca... | VIOFO A229 Plus 2CH Front and Rear 2K+2K HDR 5GHz Wi-Fi... |

The Viofo A329 dash cam is equipped with a built-in G-sensor, which functions as an accelerometer to monitor driving behaviors, including hard braking, rapid acceleration, and collisions. When the G-sensor detects significant movement, such as a collision, the dash cam automatically locks the recorded footage to prevent it from being overwritten. This ensures that crucial evidence is preserved for later review.

Loop Recording & Auto Emergency Lock
Endless Recording, Instant Protection

A329 supports seamless loop recording, automatically overwriting the oldest videos with the newest ones. With the built-in G-sensor, the dash cam will automatically lock the footage in case of collision or crash, replaying the accident scene for investigation.

| A329 1CH | A229 PLUS 1CH | A229 PRO 1CH | A119 MINI 2 | VS1 |

| A119 V3 | A129 PLUS | A129 PRO | WM1 | A139 PRO 1CH |

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A329 supports seamless loop recording, automatically overwriting the oldest videos with the newest ones. With the built-in G-sensor, the dash cam will automatically lock the footage in case of collision or crash, replaying the accident scene for investigation.

Ready to Take Action

Stay focused on driving with voice control. The camera allows you to start/stop recording, take photos, and turn on/off WiFi with simple spoken commands in multiple languages. It can also clearly notifies you of settings changes or memory card errors.

Driver Fatigue Alarm

Reminds you to take a break.

Collision Detection: The G-sensor detects impacts and sudden stops, automatically locking the video footage to prevent overwriting.

Emergency Recording: Any significant movement is recorded, ensuring vital moments are captured and saved.

COUNT I

DIRECT INFRINGEMENT OF THE '846 PATENT

17.

Plaintiff incorporates by reference the allegations of Paragraphs 1-16.

18.

Defendant has directly infringed and continues to directly infringe at least one or more

claims of the '846 Patent, through, among other activities, making, using, and incorporating into

Defendant's respective dash cams automatic programs for monitoring human activities while

driving.

19.

Independent Claim 1 of the '846 Patent, shown in italics, recites:

> *1. A method for use in connection with a wireless communication device (WCD) transported by a mobile thing (MT), the WCD having a computer architecture that has access to a memory, comprising: determining a mobile thing motion activity (MTMA) associated with the MT that is transporting the WCD based at least in part upon sensor data, the sensor data derived from one or more sensors associated with the WCD,*

Defendant's dash cams are advanced telematics solutions packaged in wireless communication

devices that monitor accelerometer and other sensor data for precise monitoring and determination

of driver behaviors. By analyzing x, y, and z axis accelerations, these dash cams accurately capture

movements and vibrations of vehicles. Unlike traditional systems, Defendant's dash cams excel in

identifying a risky driving event, such as hard braking and accidents, among others.

> *the one or more sensors measuring physical movement of the WCD in three dimensional space and producing data sets comprising three movement values and a time value, each of the three movement values indicative of physical movement of the WCD relative to a respective axis in a three dimensional (3D) coordinate system at the time value in order to permit statistical analysis of the physical movement;*

The 3 axis accelerometer and/or gyroscope data is measured by using time values for statistical analysis for determining driver motion activities.

> *selecting an advertisement based at least in part upon the determined MTMA; causing the advertisement to be communicated to the WCD; and*

Defendant's dash cams use servers and software for communicating driver behaviors designed to help drivers improve their driving skills through feedback based on detected driving behaviors. The system analyzes events such as hard braking, fast accelerations, and collisions, providing drivers with account-based notifications via email, SMS, and proprietary mobile applications. These notifications of risky driving behaviors or accidents, prompt drivers to review the event, encouraging them to identify and avoid unsafe driving habits. By notifying drivers of the event the system helps improve safety, reduce accidents, and lower insurance costs, fostering better driving behavior and promoting safer roads.

> *wherein the determining the MTMA comprises: storing a plurality of reference MTMA signatures in the memory, each of the MTMA signatures including frequency and/or time information associated with sensor data pertaining to a specific MTMA;*

The process of comparing the reference data with live accelerometer and/or gyroscope data to reference motion activity creates signatures that include frequencies and/or timing for accurately identifying each activity.

> *determining a normalizing mathematical relationship so that different data sets separated in time can be analyzed in the 3D coordinate system; using the normalizing mathematical relationship, determining normalized data sets; analyzing the normalized data sets in the frequency and time domains;*

The raw accelerometer data contains gravity accelerations that must be normalized (removing the extra data) for accurately measuring the accelerometer's x, y and z axes. Gravity may also be used for determining the 3D coordinate system's z axis or vertical (and subsequently horizontal) positions for normalizing the live data into sets of orthogonal data so that the frequency and time

domains are measuring vertical and horizontal accelerations separately and accurately.

Normalizing the live data into sets of data that may be measured in the frequency and time domains

allows the live 3D (3 or more axis from the accelerometer and/or gyroscope) data to be compared

to the reference data:

Claim 1 concludes:

> *determining likelihoods associated with the stored MTMA signatures based at least in part upon the analyzing; and selecting a most likely MTMA signature from the plurality of MTMA signatures based at least in part upon the likelihoods.*

Based on a range of live data sets and how accurately these data sets match the motion activity

referenced data, the motion activity is at least in part determined based on the predetermined

thresholds and ranges in the frequency and time domains. This method ensures an efficient and

reliable assessment of the motion activity.

20.

Claim 2 of the '846 Patent, for example, recites:

> *2. The method of claim 1, wherein the advertisement is communicated to the WCD via an email or text message.*

Defendant's dash cams monitor driver behaviors and use advertisement notifications and or reward

messages so participants are automatically enrolled to receive in-app messages, text messages and

or summary emails.

21.

Claim 3 of the '846 Patent, for example, recites:

> *3. The method of claim 1, further comprising determining an identification (ID) of the MT and wherein the selecting the advertisement is further based at least in part upon the determined ID in addition to the determined MTMA.*

Defendant's dash cams receive notifications and onscreen events (advertisements) for promoting better driving.

22.

Claim 4 of the '846 Patent, for example, recites:

> *4. The method of claim 1, further comprising determining a location of the WCD and wherein the selecting the advertisement is further based at least in part upon the location in addition to the determined MTMA.*

Defendant's dash cams monitor driver behavior and determine locations where violations occur (also when drivers finish and or start routes). Notifications and updated screens show route and location violations and driver events are updated and provided to the user, fleet managers, and servers.

23.

Claim 5 of the '846 Patent, for example, recites:

> *5. The method of claim 1, further comprising receiving a payment for or otherwise monetarily benefiting from causing the advertisement to be communicated.*

Defendant's dash cams monitor driver behavior and provide onscreen and in app messages that improve driver behaviors.

24.

Claim 6 of the '846 Patent, for example, recites:

> *6. The method of claim 1, wherein the causing comprises enabling an advertiser to communicate the advertisement to the WCD by advising a remote computer system associated with the advertiser of the MTMA.*

Defendant's dash cams send predefined notifications/advertisements from a remote computer system that may be re-configured from time to time.

25.

Claim 7 of the '846 Patent, for example, recites:

> *7. The method of claim 1, further comprising enabling a user of the WCD to enable and disable the causing of the advertisement.*

Defendant's dash cams allow users to choose if messages will be sent to email/phone or to opt out.

26.

Claim 8 of the '846 Patent, for example, recites:

> *8. The method of claim 1, wherein the sensor data is derived from an accelerometer, a gyroscope, or both.*

As demonstrated, *supra* with respect to Claim 1, Defendant's dash cams use sensor data from the

accelerometer and/or the gyroscope.

27.

Claim 9 of the '846 Patent, for example, recites:

> *9. The method of claim 1, wherein the steps are performed in the WCD itself or in one or more communicatively coupled computer systems that are remote from the WCD and that receive the sensor data from the WCD.*

Defendant's dash cams monitor driver behavior from the internal WCD sensors and also use one

or more remote servers to make certain decisions that enhance the accuracy of sensor data. For

example, the driver score is calculated based on at least in part the sensor data that determines

violations such as unsafe driving, hard braking, and unnecessary acceleration.

28.

Claim 10 of the '846 Patent, for example, recites:

> *10. The method of claim 1, wherein the WCD is communicatively coupled to a remote computer system and wherein the memory is associated with the remote computer system.*

Defendant's dash cams monitor driver behavior from the internal WCD sensors and also use one

or more remote servers to make certain decisions that enhance the accuracy of sensor data.

29.

Claim 11 of the '846 Patent, for example, recites:

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> *11. The method of claim 1, wherein the memory is local and situated within the WCD.*

Defendant's dash cams process and use memory for certain events and logging of data, that is separate from connecting to servers for all storage, computing and memory needs/requirements.

30.

Independent Claim 12 of the '846 Patent, shown in italics, recites:

> *12. A wireless communication device (WCD) transported by a mobile thing (MT), comprising: one or more transceivers designed to enable access to a remote computer system, the remote computer system designed to select a targeted advertisement and enable the advertisement to be communicated or accessed by the WCD;*

Defendant's dash cams use wireless communication devices carried by a vehicle (mobile thing). The WCDs have accelerometers and/or gyroscopes and a computer architecture that accesses memory and code. Defendant's dash cams monitor accelerometer and other sensor data for determining driver behaviors, utilizing advanced technology for precise monitoring of driver behavior. By analyzing *x*, *y*, and *z*-axis accelerations, the system accurately captures the movements of vehicles. Defendant's dash cams excel in identifying risky driving behaviors such as harsh acceleration, braking, and turning. Defendant's dash cams use transceivers designed to send and receive from remotely located servers. On information and belief, advertisements from the servers are communicated to and/or accessed by the users' smartphone applications.

> *one or more memories designed to store computer program code; and one or more processors designed to execute the computer program code, the computer program code comprising: code designed to determine mobile thing motion activity (MTMA) of the MT that is transporting the WCD based at least in part upon the sensor data and the statistical analysis of the physical movement of the WCD;*

Defendant's dash cams use WCD memory to store the program code and the WCD processor(s) to execute the program code. The code determines the motion activity through the use of the sensor data and the statistical analysis of the movement of the vehicle.

> *code designed to communicate the sensor data or a mobile thing motion activity (MTMA) of the MT that is transporting the WCD and that is derived from the sensor data via the one or more transceivers to the remote computer system in order to enable selection of the targeted advertisement that is suited for the determined MTMA; code designed to receive and locally communicate the advertisement to a user interface of the WCD; and*

Defendant's dash cams code is designed to communicate sensor data or the identified motion activity (user driving, using phone for text messaging, aggressively cornering and others) to the server, and, on information and belief, the server has code designed to communicate advertisements to associated smartphone applications.

> *wherein the code designed to determine the MTMA comprises: code designed to store a plurality of reference MTMA signatures in the memory, each of the MTMA signatures including frequency and/or time information associated with sensor data pertaining to a specific MTMA; code designed to determine a normalizing mathematical relationship so that different data sets separated in time can be analyzed in the 3D coordinate system;*

Defendant's dash cams code normalizes the live data into sets of data that may be measured in the frequency and time domains and allows the live 3D (three or more axes from the accelerometer and/or gyroscope) data to be compared to the reference data. Code is used to determine time separations so the raw data may be analyzed in a 3D coordinate system.

> *code designed to, using the normalizing mathematical relationship, determine normalized data sets; code designed to analyze the normalized data sets in the frequency and time domains; code designed to determine likelihoods associated with the stored MTMA signatures based at least in part upon the analyzing; and code designed to select a most likely MTMA signature from the plurality of MTMA signatures based at least in part upon the likelihoods.*

Defendant's dash cams code is used to match timed data and analyze the normalized data sets in the frequency and time domains. The code determines the likelihoods of the stored reference data and selects the most likely motion activity from a plurality of reference data (signatures) based on such likelihoods.

COUNT II

DIRECT INFRINGEMENT OF THE '558 PATENT

31.

Plaintiff incorporates by reference the allegations of Paragraphs 1-16.

32.

Defendant has directly infringed and continues to directly infringe at least one or more claims of the '558 Patent, through, among other activities, making, using, and incorporating into Defendant's respective dash cams automatic programs for monitoring human activities while driving.

33.

Independent Claim 1 of the '558 Patent, shown in italics, recites:

> *1. A method, comprising: receiving a time value and at least three streams of data sample values from one or more sensors of a wireless communication device (WCD) that is transported by a mobile thing (MT), each data sample value indicative of movement of the WCD at a corresponding time value;*

Defendant's dash cams use advanced computing technology, including cellular communication (WCD), GPS, and accelerometers, to detect 3D accelerations on the *x*, *y*, and *z* axes.   This accelerometer data is essential for identifying driving behaviors such as hard braking, rapid accelerations, and aggressive cornering maneuvers.   Additionally, the devices automatically record, lock and store footage for safety, legal, or insurance purposes.

> *recognizing a particular set of data sample values as a reference for defining an orientation of the WCD in a coordinate system;*

Defendant's dash cams collect a wide range of accelerometer data sample values.   These data updates are delivered in a structured data-object format, which contains detailed information about the device's accelerations, including gravity ($g \approx 9.81$ m/s²).   The gravity data is then processed to

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determine a direction and or influences to axis data, and to make accurate movement calculations. The dash cam devices may be moved or adjusted, and they will auto-orient themselves to determine their exact position. Each time the applications run, the device self-calibrates, improving its orientation accuracy with harsh driving and accident detection.

> *computing reference data based upon the recognition of the particular set, the reference data defining a relationship between each set of subsequent non-reference data sample values and the particular reference set of data sample values in the coordinate system;*

Defendant's dash cams operate on data sample values collected from the accelerometers. The accelerometer sends updates to a listening code, which prompts the system to take action. These updates contain device acceleration information, including gravity or corrected accelerometer data. The reference data is determined by whether or not gravitational accelerations are included. Ensuring accurate and up-to-date accelerometer data is crucial for the dash cams to deliver optimal performance in identifying driver behaviors, for maintaining precise measurements and real-time calculations, and for enhancing the overall user experience.

> *calculating movement data in the coordinate system of one or more other non-reference data sample values based upon the reference data; and*

Defendant's dash cams continually monitor for driver behaviors, calculating real-time movement accelerations across the x, y, and z axes of accelerometer data. These computations are executed within concise time periods, forming dynamic data blocks that provide critical insights into driver performance.

> *determining a mobile thing motion activity (MTMA) associated with the MT based upon the movement data.*

Defendant's dash cams are equipped with advanced accelerometers that monitor movement across the x, y, and z axes, enabling the detection of an unsafe driving activity such as hard braking, rapid acceleration, and accidents. These dash cams are designed to automatically record, lock, and

store footage whenever significant motion activity is detected. This ensures that critical video evidence is preserved, offering valuable data for safety analysis, legal proceedings, or insurance claims, based on the real-time movement data processed by the devices.

34.

Claim 2 of the '558 Patent, for example, recites:

> *2. The method of claim 1, further comprising: prior to recognizing, mathematically combining the data sample values of the particular reference set; and recognizing the particular reference set as the reference when a combined value has a magnitude that is indicative of a relationship to Earth gravity.*

Defendant's dash cams use the accelerometer x, y and z axis data to determine and recognize the direction of Earth's gravity. Because vehicle movements are dynamic, *i.e.*, the orientation is not static and therefore an unknown variable, Defendant's dash cams monitor the direction of the Earth's gravity to establish the current orientation of the vehicle by totaling the three accelerometer axis (x, y and z) data over short time periods that is equal to the Earth's gravity (9.807 m/s^2).

35.

Claim 4 of the '558 Patent, for example, recites:

> *4. The method of claim 1, wherein: each set of data sample values includes a vector defined by three data sample values x, y, z; the reference data is a rotation matrix M; and the movement data comprises a vertical magnitude along the z axis and a horizontal magnitude along the x, y plane, both derived from a rotated vector, the rotated vector equal to the rotation matrix M multiplied by the vector associated with the other non-reference data sample values x, y, z.*

Defendant's dash cams use the accelerometer x, y and z axis data to determine and recognize the direction of Earth's gravity. After the direction of the Earth's gravity (9.807 m/s^2) is determined, for example, Defendant's dash cams first determine the vertical direction, then a second horizontal direction is determined by rotating the vector for measuring acceleration on a horizontal plane.

36.

Claim 9 of the '558 Patent, for example, recites:

> *9. The method of claim 1, wherein the reference data is in the form of a rotation matrix that normalizes the sets of non-reference data sample values with respect to Earth gravity.*

On information and belief, Defendant's dash cams determine and measure horizontal motion through a rotation matrix to Earth's gravity.

37.

Claim 10 of the '558 Patent, for example, recites:

> *10. The method of claim 1, wherein the movement data is in the time domain (TD) and wherein the computing comprises: computing a magnitude of the movement data in each of the two dimensions of space; computing one or more TD statistical metrics from the magnitudes; and wherein the MTMA determining is based at least in part upon the TD statistical metrics.*

Defendant's dash cams measure acceleration by magnitude and time to determine motion activities.

38.

Claim 13 of the '558 Patent, for example, recites:

> *13. The method of claim 1, wherein one or more of the steps of the method is implemented in the WCD, in a computer system that is remote to the WCD, or in a combination of both.*

Defendant's dash cans are driver behavior, and accident tracking systems equipped with accelerometers and other sensors that communicate with or connect to smartphone applications. These systems integrate various technologies, such as servers and cloud solutions, IOS and Android applications to optimize customer driver safety.

39.

Independent Claim 17 of the '558 Patent, shown in italics, recites:

17. A method, comprising: receiving first and second data from one or more sensors associated with a wireless communication device (WCD) transported by a mobile thing (MT), the first and second data indicative of movement of the WCD;

Defendant's dash cams integrate advanced computing and processing technologies, combining wireless communication, GPS, and sophisticated 3-axis accelerometers to monitor driving activities. These accelerometer sensors measure 3D movements, allowing for precise tracking of key driving behaviors. By analyzing the collected data, the system filters out gravitational forces and non-relevant movements, ensuring reliable detection of critical events. The dash cam monitors motion across the *x*, *y*, and *z* axes, enabling it to detect unsafe driving behaviors such as hard braking, rapid acceleration, and accidents. The system automatically records, locks, and stores the footage, making it readily available for safety, legal, or insurance purposes.

Claim 17 continues:

determining reference data that defines a reference framework from the first data;

Defendant's dash cams collect a wide range of accelerometer data sample values. These updates are delivered in a structured data-object format, which contains detailed information about the device's accelerations, including gravity (g ≈ 9.81 m/s²). This first data determines at least the gravity's influences, so one or more subsequent data comparisons are void of non-device movements.

normalizing the second data with the reference data so that the second data can be analyzed in the reference framework; and

Defendant's dash cams ensure accurate comparisons by creating reference data that neutralized the influences of gravity. This crucial step enables precise data analysis and evaluation of device movement data only.

identifying a mobile thing motion activity (MTMA) associated with the MT based upon the normalized second data.

26

Defendant's dash cams leverage advanced accelerometer technology to analyze real-time movement data by filtering out gravitational forces (g ≈ 9.81 m/s²). By omitting the influence of gravity, the dash cams can more accurately detect aggressive driving activity such as hard braking, rapid acceleration, and potential accidents. This precise measurement allows the devices to immediately identify a motion activity, ensuring that unsafe driving activities or collisions are captured and recorded. The systems then securely lock and store the footage for future reference, providing critical data for safety assessments, legal cases, or insurance claims.

40.

Claim 19 of the '558 Patent, for example, recites:

> *19. The method of claim 17, wherein the reference data is indicative of a relationship to Earth gravity.*

Defendant's dash cams use the accelerometer *x*, *y* and *z* axis data to determine and recognize the direction of Earth's gravity. Vehicle movements are dynamic; therefore Defendant's dash cams monitor the direction of the Earth's gravity to establish an orientation of the vehicle by totaling the accelerometer axis data over short time periods that is equal to the Earth's gravity (9.807 m/s^2).

41.

Claim 20 of the '558 Patent, for example, recites:

> *20. The method of claim 17, wherein the reference data is determined in the form of vector information indicative of a relation to Earth gravity by comparing the first data to a predefined numerical range.*

Defendant's dash cams use the accelerometer *x*, *y* and *z* axis data to determine and recognize the direction of Earth's gravity. Because vehicle movements are dynamic and the orientation is not a given variable, Defendant's dash cams monitor the direction of the Earth's gravity to establish an orientation of the vehicle by totaling the accelerometer axis data over short time periods that is equal to the Earth's gravity (9.807 m/s^2).

42.

Claim 21 of the '558 Patent, for example, recites:

> *21. The method of claim 20, wherein the one or more sensors produce first, second, and third sample data along each of 3 axes in a three dimensional (3D) coordinate system and wherein the first data pertains to a value that equals one within a predefined range, the value computed by combining the first, second, and third sample data.*

Defendant's dash cams use the accelerometer x, y and z axis data to measure linear acceleration to sense data over multiple samples to accurately identify the motion activity.

43.

Claim 25 of the '558 Patent, for example, recites:

> *25. The method of claim 17, wherein one or more of the steps of the method is implemented in the WCD, in a computer system that is remote to the WCD, or in a combination of both.*

Defendant's dash cans are driver behavior, and accident tracking systems equipped with accelerometers and other sensors that communicate with or connect to smartphone applications. These systems integrate various technologies, such as servers and cloud solutions, IOS and Android applications to optimize customer driver safety.

44.

Independent Claim 27 of the '558 Patent, shown in italics, recites:

> *27. A method for implementation in a wireless communication device (WCD) that is designed to detect a plurality of mobile thing motion activities (MTMAs) associated with a mobile thing (MT), comprising:*

Defendant's dash cams are equipped with advanced computing technology that integrates communication systems, GPS tracking, and 3-axis accelerometers to deliver real-time, comprehensive monitoring of driving behaviors. The accelerometers track movement along the x, y, and z axes, providing precise detection of critical driving events and collisions. By analyzing this accelerometer data, the dash cams automatically activate recording and lock footage when

significant motion is detected, such as during unsafe driving or impact. This ensures vital video

evidence is securely stored and easily accessible for safety assessments, legal actions, or insurance

claims, offering users enhanced peace of mind through reliable data capture and real-time event

analysis.

> *receiving a plurality of data sample values from one or more sensors of the WCD that is transported by the MT, the data sample values indicative of movement of the WCD;*

Defendant's dash cams leverage data from three-axis accelerometers to identify potentially unsafe

driving activities and accidents. This advanced technology continuously monitors the devices'

movements using the accelerometer and other sensors, ensuring real-time analysis of driving

patterns.

> *computing reference data, the reference data defining a relationship between data sample values and a reference framework to enable comparison of data sample values; calculating movement data based upon the reference data and the data sample values; and*

Defendant's dash cams collect a wide range of accelerometer data sample values. These updates

are delivered in a structured data-object format, which contains detailed information about the

device's accelerations, including gravity ($g \approx 9.81$ m/s²).

> *determining an MTMA associated with the MT based upon the movement data.*

Defendant's dash cams monitor accelerometer and other sensor data for determining driver

behaviors from the movement data.

45.

Claim 28 of the '558 Patent, for example, recites:

> *28. The method of claim 27, further comprising: recognizing a particular set of data sample values as a reference for defining an orientation of the WCD in a coordinate system; determining a rotation matrix based upon the particular set of reference data sample values; and calculating the*

29

> *movement data based upon the rotation matrix and one or more sets of the*
> *data sample values that are not the particular reference set.*

Defendant's dash cams use the accelerometer *x*, *y* and *z* axis data to determine and recognize the direction of Earth's gravity. After the direction of the Earth's gravity is determined, for example, Defendant's dash cams first determine the vertical direction, then a second horizontal direction is determined by rotating the vector for measuring acceleration on a horizontal plane.

46.

Claim 33 of the '558 Patent, for example, recites:

> *33. The method of claim 27, wherein the reference data is indicative of a*
> *relationship to Earth gravity.*

Defendant's dash cams use reference data to match sensor data that corresponds to Earth's gravity.

47.

Independent Claim 42 of the '558 Patent, shown in italics, recites:

> *42. A system, comprising: one or more memories designed to store*
> *computer program code; one or more processors designed to execute the*
> *computer program code; and wherein the computer program code*
> *comprises:*

Defendant's dash cams leverage cutting-edge computing technologies to process real-time data, communication, GPS, and built-in 3D accelerometers. These accelerometers track movement along the *x*, *y*, and *z* axes, enabling the dash cams to detect an unsafe driving activity. When an activity is determined, the devices automatically record, lock, and securely store the footage, ensuring it is preserved for safety, legal, or insurance purposes. This advanced technology provides comprehensive monitoring and reliable event documentation for drivers.

> *code to receive first and second data from one or more sensors associated*
> *with a wireless communication device (WCD) transported by a mobile thing*
> *(MT), the first and second data indicative of movement of the WCD;*

Defendant's dash cams include codes for accurately measuring advanced movement with sensor data by identifying gravity (non-movement data) for accurate comparisons. The code allows for the collection of data sample values from the x, y, and z axes of accelerometer and gyroscope sensors. With predefined timed lengths, the code is measured in at least first and second data samples. The first set of data includes gravity influences, but the system is able to distinguish non-movement influences (like gravity) and/or the positioning of the device in the second set of movement data.

> *code to determine reference data that defines a reference framework from the first data;*

Defendant's dash cams include codes to determine a frequency, time length, block, and or data group for the first data. Defendant's dash cams include codes that determine a vertical and/or horizontal framework so the reference data may used in determining driving motion activities.

> *code to normalize the second data with the reference data so that the second data can be analyzed in the reference framework; and*

Data sets from the movements (acceleration) are normalized by values, ranges, frequencies and/or time so as to be compared to the reference data. Defendant's dash cams code removes the rotational changes to the three-dimensional (3D) coordinate system by normalizing the data with the gravity-based determination of the vertical axis.

> *code to identify a mobile thing motion activity (MTMA) associated with the MT based upon the normalized second data.*

Defendant's dash cams include code to identify a motion activity based upon the normalized data, enabling the detection of aggressive and potentially unsafe driving activities including accidents. Additionally, they can determine when accidents occur by comparing normalized data during the second step of analysis.

48.

Claim 43 of the '558 Patent, for example, recites:

43. The system of claim 42, wherein the second data comprises a plurality of periodic samples.

Defendant's dash cams continually compare a plurality of accelerometer and/or gyroscope data samples.

49.

Claim 44 of the '558 Patent, for example, recites:

44. The system of claim 42, wherein the reference data is indicative of a relationship to Earth gravity.

Defendant's dash cams use the earth's gravity to determine how to measure raw data against reference data.

50.

Claim 45 of the '558 Patent, for example, recites:

45. The system of claim 42, wherein the reference data is determined in the form of vector information indicative of a relation to Earth gravity by comparing the first data to a predefined numerical range.

On information and belief, Defendant's dash cams use the earth's gravity to determine a magnitude and direction numbers (vector) for comparing a predefined numerical range.

51.

Claim 46 of the '558 Patent, for example, recites:

46. The system of claim 45, wherein the one or more sensors produce first, second, and third sample data along each of 3 axes in a three dimensional (3D) coordinate system and wherein the first data pertains to a value that equals one within a predefined range, the value computed by combining the first, second, and third sample data.

Accelerometers are sensors which measure acceleration in an x, y and z axis, the change in velocity over time (SI unit: m/s^2). On information and belief, Defendant's dash cams measure acceleration

of the vehicle in time-segments, using first, second, et cetera, to confirm multiple time-segment

matches to confirm most driver activities.

52.

Claim 50 of the '558 Patent, for example, recites:

> *50. The system of claim 42, wherein the system is implemented in the WCD, in a computer system that is remote to the WCD, or in a combination of both.*

Defendant's dash cans are driver behavior, and accident tracking systems equipped with

accelerometers and other sensors that communicate with or connect to smartphone applications.

These systems integrate various technologies, such as servers and cloud solutions, IOS and

Android applications to optimize customer driver safety.

53.

Independent Claim 52 of the '558 Patent, shown in italics, recites:

> *52. A system for implementation in a wireless communication device (WCD) that is designed to detect a plurality of mobile thing motion activities (MTMAs) associated with a mobile thing (MT), comprising: one or more memories designed to store computer program code; one or more processors designed to execute the computer program code; and wherein the computer program code comprises:*

Defendant's dash cams leverage cutting-edge computing technologies to process real-time data,

communication, GPS, and built-in 3D accelerometers. These accelerometers track movement

along the x, y, and z axes, enabling the dash cams to detect an unsafe driving activity. When an

activity is determined, the devices automatically record, lock, and securely store the footage,

ensuring it is preserved for safety, legal, or insurance purposes. This advanced technology

provides comprehensive monitoring and reliable event documentation for drivers.

> *code to receive a plurality of data sample values from one or more sensors of the WCD that is transported by the MT, the data sample values indicative of movement of the WCD;*

33

Defendant's dash cams continuously monitor updated accelerometer data across the x, y, and z axes from their built-in sensors. This data reflects the device's movements, allowing the dash cams to accurately track and respond to changes in the vehicle's motion, such as acceleration, braking, or impacts, providing precise analysis for real-time event detection.

> *code to compute reference data, the reference data defining a relationship between data sample values and a reference framework to enable comparison of data sample values;*

Defendant's dash cams include code that computes reference data, such as determining when a user is driving, and a sudden stop/impact is detected. The device provides accelerometer and/or gyroscope axis data to process against reference data in a time, frequency and or size framework.

> *code to calculate movement data based upon the reference data and the data sample values; and*

Defendant's dash cams include code to monitor updated movement data over short time periods and compare it to reference data over periods of time.

> *code to determine an MTMA associated with the MT based upon the movement data.*

Defendant's dash cams detect potentially unsafe driving behaviors by analyzing accelerometer data across the x, y, and z axes, which reflects the movement of the device. This data allows the dash cams to identify when a critical activity occurs, enabling a timely recording and response to an unsafe driving activity.

54.

Claim 53 of the '558 Patent, for example, recites:

> *53. The system of claim 52, wherein the computer program code further comprises: code to recognize a particular set of data sample values as a reference for defining an orientation of the WCD in a coordinate system; code to determine a rotation matrix based upon the particular set of reference data sample values; and code to calculate the movement data based upon the rotation matrix and one or more sets of the data sample values that are not the particular reference set.*

34

Defendant's dash cams include computer program code to recognize gravity measurements within the *x*, *y*, and *z* axes that define an orientation.   Code determines and extracts gravitational acceleration so an actual acceleration (without gravity's acceleration) may be accurately measured within data samples.

55.

Claim 54 of the '558 Patent, for example, recites:

> *54. The system of claim 52, wherein the data sample values are received from a plurality of the sensors.*

Defendant's dash cams use data sample values from accelerometer's and/or gyroscope's the *x*, *y* and *z* axes.

56.

Claim 55 of the '558 Patent, for example, recites:

> *55. The system of claim 54, wherein the plurality of sensors include at least an accelerometer and a gyroscope.*

Defendant's dash cams use accelerometers sensors for monitoring linear acceleration over time periods for determining driving motion activities.

57.

Claim 58 of the '558 Patent, for example, recites:

> *58. The system of claim 52, wherein the reference data is indicative of a relationship to Earth gravity.*

Defendant's dash cams subtract earth's gravity influence from the raw accelerometer data so the reference data may accurately represent the motion activity.

COUNT III

DIRECT INFRINGEMENT OF THE '951 PATENT

58.

Plaintiff incorporates by reference the allegations of Paragraphs 1-16.

59.

Defendant has directly infringed and continues to directly infringe at least one or more

claims of the '951 Patent, through, among other activities, making, using, and incorporating into

Defendant's respective dash cams automatic programs for monitoring human activities while

driving.

60.

Independent Claim 1 of the '951 Patent, shown in italics, recites:

> *1. A wireless communications device (WCD), comprising: one or more*
> *memories that store computer program code; and one or more processors*
> *that execute the computer program code, the computer program code*
> *comprising:*

Defendant's dash cams are advanced computing devices that include wireless capabilities, GPS,

and a three-axis accelerometer for motion detection. These devices store program code in one or

more memories and execute the code with one or more processors. The program code enables

each device to understand its movement, activities, and sometimes surroundings using x, y, and z

axis data within a 3D coordinate system.

> *instructions to enter a first mode of operation involving a first investigation*
> *process with one or more sensors, the first investigation process capturing*
> *first data with the one or more sensors;*

Defendant's dash cams utilize advanced logic algorithms to monitor vehicular movements and

determine specific operational modes such as parked, aggressive driving, (*i.e.*, hard braking and

fast acceleration) and accident detection. During driving mode, they continuously track real-time

data related to driver actions, other vehicles, road conditions, obstacles, from the acceleration

intensities or frequencies.

> *instructions to determine whether or not the first data is indicative of an activity relating to a user need for assistance, an accident, or a crime; and*

Defendant's dash cams utilize advanced technologies to detect potential accidents. These systems

are triggered when predefined thresholds are exceeded, indicating that the driver may be involved

in an accident or may require assistance.

> *instructions to, when the first data may involve the activity, enter into a second mode of operation involving a second investigation process that is different than the first investigation process and that involves the one or more sensors and/or one or more other sensors in order to capture second data that is further indicative of the activity.*

Defendant's dash cams monitor data that identifies unsafe driving behavior or an accident and

trigger a secondary process to capture and transmit pre- and post- accident information.

Additionally, the systems use this data to lock videos, and activate alerts for the driver, such as

buzzers, lights, and communication notifications.

61.

Claim 2 of the '951 Patent, for example, recites:

> *2. The system of claim 1, wherein the first data and/or the second data is an image, a video sample, and/or an audio sample.*

Defendant's dash cams use the first and or second data as an image, video, and or audio of the

event.

62.

Claim 3 of the '951 Patent, for example, recites:

> *3. The system of claim 1, wherein the computer program code further comprises: instructions to determine a human body physical activity (HBPA) associated with a WCD user based at least in part upon the first data and/or the second data; and instructions to communicate HBPA*

identification information to a remote computer system to permit analysis in connection with whether or not the first data corresponds to the activity.

Defendant's dash cams enhance the accuracy of detecting driver behaviors by utilizing accelerometer data, which is transmitted to remote servers for advanced analysis and processing.

63.

Claim 4 of the '951 Patent, for example, recites:

4. The system of claim 1, wherein the computer program code further comprises: instructions to communicate the first data to a remote computer system to permit analysis in connection with whether or not the first data involves the activity; and receiving information from the remote computer system, the information indicative of whether or not the first data corresponds to the activity.

Defendant's dash cams accurately detect events such as hard braking, rapid accelerations, sharp turns, and accidents by continuously monitoring accelerations though the 3 axis accelerometers for real-time driving data. When an event is identified, the system immediately captures the relevant event, which is then sent for further review, ensuring critical incidents are documented and available for analysis.

64.

Claim 8 of the '951 Patent, for example, recites:

8. The system of claim 1, wherein the computer program code further comprises: instructions to compare the first data and/or the second data with reference data; and instructions to detect an event in an environment associated with the WCD based upon the comparison.

Defendant's dash cams increase accuracy for detecting driver behaviors with accelerometers by monitoring multiple samples over short periods of time by comparing reference data that filters out gravity and other data for gaining pure samples of the accelerometer axis data that is used in the comparison step(s).

65.

Claim 9 of the '951 Patent, for example, recites:

> *9. The system of claim 8, wherein the comparison is in the time domain, frequency domain, or both.*

Defendant's dash cams increase accuracy for detecting driver behaviors with accelerometers by monitoring multiple samples over short periods of time by comparing reference data that filters out gravity and other data for gaining pure samples of the accelerometer axis data that is used in the comparison step(s).

66.

Independent Claim 10 of the '951 Patent, shown in italics, recites:

> *10. A wireless communications device (WCD), comprising: one or more memories that store computer program code; and one or more processors that execute the computer program code, the computer program code comprising:*

Defendant's dash cams incorporate advanced computing devices that include cellular capabilities, GPS, and a three-axis accelerometer for motion detection. These devices utilize program code stored in one or more memories and executed by one or more processors. This code enables the device to interpret its movement and activities using x, y, and z axis data within a 3D coordinate system.

> *instructions to produce data from one or more sensors associated with the WCD; instructions to determine a human body physical activity (HBPA) associated with a WCD user based upon the data;*

Defendant's dash cams incorporate program code to detect instances of aggressive and potentially unsafe driving, such as hard braking and rapid acceleration, as well as to identify accidents based on accelerometer data. The devices execute instructions to analyze data from one or more sensors associated with the wireless dash cam device. Furthermore, the program code includes instructions to assess driving behaviors linked to the user based on this sensor data.

39

> *instructions to select a mode of operation from a set of modes, based upon the determined HBPA, the set including different modes of operation involving initiation of different investigation processes that capture different types of data; and*

Defendant's dash cams are equipped with intelligent operational modes to identify aggressive driving behavior such as hard braking and fast accelerations. These devices include instructions to select an operational mode from a set of options based on the detected driving activity. This set encompasses various modes of operation that initiate different investigation processes to capture pre/actual/post video, lock the video, and others.

> *instructions to communicate the data to a remote computer system.*

Defendant's dash cams communicate surveillance information such as unsafe driving behaviors and accident data to remote servers for logging events and engaging additional actions.

COUNT IV

DIRECT INFRINGEMENT OF THE '914 PATENT

67.

Plaintiff incorporates by reference the allegations of Paragraphs 1-16.

68.

Defendant has directly infringed and continues to directly infringe at least one or more claims of the '914 Patent, through, among other activities, making, using, and incorporating into Defendant's respective dash cams automatic programs for monitoring human activities while driving.

69.

Independent Claim 5 of the '914 Patent, shown in italics, recites:

> *5. A system comprising: at least one computing device; and at least one application executable in the at least one computing device, the application comprising:*

Defendant's dash cams use 3 axis accelerometers for motion detection. This technology allows

the device to understand its movement with the *x*, *y* and *z* axis data of a 3D coordinate system. The

accelerometer data is crucial in analyzing aggressive and potentially unsafe driving behaviors, such

as hard braking and rapid acceleration and also accidents.

> *logic that determines a user activity and/or user surroundings;*

Defendant's dash cams utilize logic for monitoring techniques to assess the range or likelihood of

events in verifying user activities and surroundings through repeated patterns, frequencies and or

spikes. This enables the identification and confirmation of vehicle movements.

> *logic that determines a surveillance mode that corresponds to the user*
> *activity and/or the user surroundings;*

Defendant's dash cams incorporate intelligent systems that activate as soon as the vehicle starts.

These systems continuously analyze sensor data to detect risky driving behaviors, such as hard

braking and rapid acceleration, or when accidents occur. Additionally, the accident surveillance

mode is triggered in the event of a crash. This mode monitors the accelerometer sensor data and

captures the activity video of the accident. During this period, the system records additional video

and information of the accident.

> *logic that facilitates a user-defined response to the user activity and/or the*
> *user surroundings; and*

Defendant's dash cams are equipped with intelligent systems that automatically activate accident

surveillance mode upon detecting a collision. When triggered, the device may emit a beep, flash,

or display an on-screen notification to alert the driver that recording is in progress. This feature

provides real-time visual confirmation that the event is being captured. However, to access the

DVR and review recorded or remote files, the driver is prompted to stop recording, ensuring safety

and preventing distractions while driving. This intuitive system enhances post-incident sharing of

the review and data management.

logic that communicates surveillance information to at least one remotely located computer device.

Defendant's dash cams use logic to determine when to transmit surveillance data to remote applications, servers, and DVR or video storage and playback systems. This seamless communication allows for real-time monitoring, video storage, and easy access to recorded footage for review and analysis.

70.

Independent Claim 15 of the '914 Patent, shown in italics, recites:

15. A method comprising the steps of: determining, by a computing device, a user activity and/or user surroundings;

Defendant's dash cams utilize advanced computing devices that include, cellular, GPS and a built-in 3 axis accelerometer for motion detection. This technology allows the device to understand its movement, orientation and activities and sometime surroundings with the *x*, *y* and *z* axis data of a 3D coordinate system.

determining, by the computing device, a surveillance mode that corresponds to the user activity and/or the user surroundings;

Defendant's dash cams incorporate intelligent systems that activate as soon as the vehicle starts. These systems continuously analyze sensor data to detect risky driving behaviors, such as hard braking, rapid acceleration and accidents. This mode monitors the accelerometer sensor data and captures the event (accelerations) pre, during and post of the accident. During this period, the system sends a specialized message of the accident to servers and to applications and software.

facilitating, by the computing device, a user-defined response to the user activity and/or the user surroundings; and

Defendant's dash cams are equipped with intelligent systems that automatically activate accident surveillance mode upon detecting a collision. When triggered, the device may emit a beep, flash, or display an onscreen notification to alert the driver that recording is in progress. This feature

42

provides real-time visual confirmation that the event is being captured. However, to access the

DVR and review recorded or remote files, the driver is prompted to stop recording, ensuring safety

and preventing distractions while driving. This intuitive system enhances post-incident sharing of

the review and data management.

> *communicating, by the computing device, surveillance information to at least one remotely located computer device.*

Defendant's dash cams transmit surveillance data to remote applications, servers, and DVR

or video storage and playback systems. This seamless communication allows for real-time

monitoring, video storage, and easy access to recorded footage for review and analysis.

COUNT V

DIRECT INFRINGEMENT OF THE '273 PATENT

71.

Plaintiff incorporates by reference the allegations of Paragraphs 1-16.

72.

Defendant has directly infringed and continues to directly infringe at least one or more

claims of the '273 Patent, through, among other activities, making, using, and incorporating into

Defendant's respective dash cams automatic programs for monitoring human activities while

driving.

73.

Independent Claim 1 of the '273 Patent, shown in italics, recites:

> *1. A method, comprising: receiving a time value and three streams of data sample values from an accelerometer of a wireless communication device (WCD) that is transported by a mobile thing (MT), each data sample value indicative of an acceleration of the WCD along an axis of a three dimensional (3D) coordinate system at a corresponding time value;*

Defendant's dash cams utilize a 3-axis accelerometer for motion detection. These devices employ advanced computing processes, enabling the use of most wireless, GPS for location and speed tracking, and accelerometers for measuring 3D accelerations and movements. The accelerometer is also instrumental in determining the device's orientation and gravity accelerations across x, y, and z axes in a 3D coordinate system along with respective time values.

> *recognizing a particular set of data sample values as a reference in the 3D coordinate system for defining a relationship between an orientation of the WCD and a two dimensional (2D) coordinate system;*

Defendant's dash cams use reference data, such as data that represents accurate identification of driving movements by accelerometer x, y, and z axis sensor data. The reference data is created to remove and or identify non-movement activities such as gravity accelerations (that are not part of the device movements) and processed to classifications such as harsh braking, harsh accelerations, and others over time periods to confirm changes and validate the motion activity for use in the application. Defendant's dash cams calculate accelerometer x, y and z axis data that totals the constant gravity acceleration. The acceleration from gravity may be removed by reducing the amount from each axis or the total amount when combining all three axes. Determining the vertical direction of gravity provides an orientation of the vehicle in a two dimensional measurement system.

> *computing reference data based upon the recognition of the particular set, the reference data defining a relationship between each set of subsequent non-reference data sample values and the particular reference set of data sample values in the 2D coordinate system;*

Defendant's dash cams compute reference data including a numeric magnitude and frequency over a predetermined time period. Raw accelerometer data that represents the acceleration of the motion activity are compared by measuring the magnitude and frequency over the same predetermined time period as the reference data.

> *calculating movement data in the 2D coordinate system of one or more other non-reference data sample values based upon the reference data; and*

Defendant's dash cams calculate the movement data in a two dimensional magnitude and frequency measurement over time. The devices calculate movement data, objects and or raw accelerometer data (the live data) with the identifiers such as accidents, objects and/or thresholds including time, peaks, ranges, frequencies, and/or averages.

> *determining a moving thing motion activity (MTMA) associated with the MT based upon the movement data.*

Defendant's dash cams identify a motion activity by normalizing the live data with the reference data over time periods for confirming activity changes over random false positives that occur from inadequate sampling.

74.

Claim 2 of the '273 Patent, for example, recites:

> *2. The method of claim 1, further comprising: prior to recognizing, mathematically combining the data sample values of the particular reference set; and recognizing the particular reference set as the reference when a combined value has a magnitude that is indicative of a relationship to Earth gravity.*

Defendant's dash cams calculate the accelerometer x, y and z axis data by adding the accelerometer axis data to locate the acceleration provided by gravity; the reference set is a measurement so the magnitude of gravity may be removed so acceleration associated with vehicle movements may be accurately measured.

75.

Claim 3 of the '273 Patent, for example, recites:

> *3. The method of claim 2, further comprising updating the reference data each time the reference set of data samples is recognized.*

45

Defendant's dash cams update the gravity reference data so acceleration from the movement of the vehicle may be accurately measured.

76.

Claim 4 of the '273 Patent, for example, recites:

> *4. The method of claim 1, wherein: each set of data sample values includes a vector defined by three data sample values x,y,z; the reference data is a rotation matrix M; and the movement data comprises a vertical magnitude along the z axis and a horizontal magnitude along the x, y plane, both derived from a rotated vector, the rotated vector equal to the rotation matrix M multiplied by the vector associated with the other non-reference data sample values x,y,z.*

Defendant's dash cams use the accelerometer x, y and z axis to determine the direction of gravity. After determining the vertical direction of gravity (z axis) a horizontal magnitude for the x and y axis is established. Defendant's dash cams use the x and y axis for determining hard braking, fast acceleration and quick cornering from drivers. The rotation matrix is applied to the raw x, y and z axis data from the accelerometer.

77.

Claim 8 of the '273 Patent, for example, recites:

> *8. The method of claim 1, wherein the reference data is in the form of a rotation matrix that normalizes the sets of non-reference data sample values with respect to Earth gravity.*

Defendant's dash cams use reference data that includes or subtracts the earth's gravity acceleration of the x, y and z axis for a combined total.

78.

Claim 11 of the '273 Patent, for example, recites:

> *11. The method of claim 1, wherein one or more of the steps of the method is implemented in the WCD.*

Defendant's dash cams implement one or more steps of the method in the dash cam (wireless communication device) carried by the vehicle.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff prays for relief that the Court enter judgment in their favor and against Defendant, granting the following relief:

That the Court enter a judgment that one or more claims of the '846 Patent have been infringed either literally and/or under the doctrine of equivalents, by Defendant;

That the Court enter judgment that one or more claims of the '558 Patent have been infringed either literally and/or under the doctrine of equivalents, by Defendant;

That the Court enter judgment that one or more claims of the'951 Patent have been infringed either literally and/or under the doctrine of equivalents, by Defendant;

That the Court enter judgment that one or more claims of the '914 Patent have been infringed either literally and/or under the doctrine of equivalents, by Defendant;

That the Court enter judgment that one or more claims of the '273 Patent have been infringed either literally and/or under the doctrine of equivalents, by Defendant;

That Defendant be ordered to pay damages adequate to compensate Plaintiff for its acts of infringement, pursuant to 35 U.S.C. § 284;

That Plaintiff be awarded increased damages under 35 U.S.C. § 284 due to Viofo's willful infringement of the '846, '558, '951, '914, and '273 Patents; That the Court find that this case is exceptional and award Plaintiff reasonable attorneys' fees pursuant to 35 U.S.C. § 285;

That Defendant, its officers, agents, employees, and those acting in privity with it, be preliminarily enjoined from further infringement, contributory infringement, and/or inducing infringement of the patent-in-suit, pursuant to 35 U.S.C. § 283;

That Defendant, its officers, agents, employees, and those acting in privity with it, be permanently enjoined from further infringement, contributory infringement, and/or inducing infringement of the patent-in-suit, pursuant to 35 U.S.C. § 283;

That Defendant be ordered to pay prejudgment and post-judgment interest;

That Defendant be ordered to pay all costs associated with this action;

That Plaintiff be granted such other and additional relief as the Court deems just, equitable, and proper.

DEMAND FOR JURY TRIAL

Pursuant to Fed. R. Civ. P. 38(b), Plaintiff demands a jury trial on all issues justiciable by a jury.

Respectfully Submitted,

Dated: November 14, 2024

/s/ Brett Thomas Cooke

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