

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC
Petitioner

v.

VALTRUS INNOVATIONS LIMITED,
Patent Owner

Case IPR2026-00262
Patent No. 7,057,509

**DECLARATION OF DAVID HILLIARD WILLIAMS
IN SUPPORT OF PETITION FOR INTER PARTES REVIEW
OF U.S. PATENT NO. 7,057,509**

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I, David Hilliard Williams, declare as follows:

I. INTRODUCTION

1. I have been retained as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“PTO”) regarding U.S. Patent No. 7,057,509 (“the ’509 patent”) (Ex. 1001).¹ I have been asked to consider whether prior art references disclose or suggest the features recited in claims 14-21, and 25-28 (“the challenged claims”) of the ’509 patent. My opinions are set forth below.

II. BACKGROUND AND QUALIFICATIONS

2. In formulating my opinions, I have relied upon my training, knowledge, and experience in the relevant art. A copy of my current *curriculum vitae* is provided as Exhibit 1003, and it provides a comprehensive description of my academic and employment history over the last thirty-plus years.

3. I am President and Founder of E911-LBS Consulting, which was founded in 2002. My firm provides consulting, research, forensics, and litigation support services in the fields of telecommunications, mobile, location-based

¹ In this Declaration, I refer to exhibits that I understand are to be attached to the petition for *Inter Partes* Review of the ’509 patent.

services, and Internet-of-Things (IoT) technologies application, device, infrastructure, and network design and implementation.

4. Prior to founding my company in 2002, I spent fifteen years as a senior technology design and implementation consultant for world-leading technology consulting firms Accenture, Booz Allen & Hamilton, and Deloitte Consulting. I started my career in 1983 as an electrical design engineer for Hughes Aircraft Company's Radar Systems Group, working on that system's analog signal-to-digital converter and control unit for the F-15 fighter jet radar system and associated capabilities including target identification, tracking and targeting, as well as communications with other aircraft, ground control, aircraft carriers, navigation beacons, etc. My relevant experience in this matter utilizes experience and expertise gained across this timeframe.

5. I obtained a BS in Electrical Engineering from Purdue University in 1983, with an emphasis on Digital System Design, graduating with top honors including the National Engineering Honor Society and National Electrical Engineering Honor Society. In 1987, I also obtained an MBA, focusing on Information Systems Management, from the University of Texas at Austin, graduating first in my class.

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6. I have over thirty-five years of experience related to wireless location services, including experience designing, implementing, and managing numerous location-based service (“LBS”) applications, such as navigation, mobile monitoring, tracking, and surveillance, vehicle telematics, as well as working in all fields within the location services ecosystem including all forms of location determination technologies, map data, handset technologies, user interfaces, and associated Information Technology systems including identification, authentication, privacy, security, and other related capabilities such as network engineering and operations. I have also served as an expert in over 50 criminal and civil forensics cases involving analyzing various forms of surveillance, monitoring, and tracking data.

7. I am currently the President of the company E911-LBS Consulting, and I have been with the company since 2002, as well President of E911-LBS Forensics Engineering, a criminal and civil forensics engineering firm. As the President of E911-LBS Consulting, I provide services across the entire wireless value chain, particularly with respect to technology and business strategic planning and product design and development associated with LBS, Global Positioning Satellite (GPS) systems, E911, WiFi-Based and other medium/long-range Real-Time Location Systems (RTLS), Radio Frequency Identification (RFID), Bluetooth, Near Field Communications (NFC), and beacon-based and other short-range

communications/location systems, and other location determination and sensing technologies and services.

8. I have extensive expertise in all aspects of product and service delivery across the wireless location ecosystem including enabling network, map data, geospatial platform, chipset, data management, device, user interface, and location determination infrastructure and integration providers. I am an expert in all related aspects of mobile location services, including use of various communications networks and associated frequencies and protocols involved in the creation, processing, and delivery of information, and key associated enablers of such device hardware and software design, use/deployment of sensors, local and centralized control systems, and underlying communications and computing architectures.

9. For example, in the 1983 to 1985 timeframe, I was a Microprocessor system design engineer on the digitization project of the F-15 fighter jet radar system. Specifically, I designed a system for converting analog signals (radar pings, sensor measurements, etc.) to digital form, and for feeding the converted signals to various parties and localized and centralized control subsystems, including pilots, carriers, and ground control stations. The converted signals corresponded to data relating to navigational and directional information, aircraft status, the location of other aircraft/targets relative to the pilot's position, and associated images.

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10. In the 1987 to 1995 timeframe, as a senior consultant/manager for Deloitte Consulting and Booz Allen & Hamilton, I designed and deployed a variety of computer centers and communications networks supporting industries including hospitality/retail, transportation, and financial services.

11. In the 1995 to 2000 timeframe, as an Associate Partner in the Communications & High Technology Practice of Accenture (one of the world's leading technology companies), I focused on using wireless location technologies to provide services to the public sector and commercial markets. From 1998 to 2000, I led the development of the LBS product/technology strategy and roadmap for Nextel Communications, Inc. (later acquired by Sprint, and now part of T-Mobile). My work with Nextel resulted in some of the earliest LBS applications in the U.S. market and included extensive research into the potential use of various technologies in providing and enabling a wide array of location-based services. Many of the Nextel products selected for development and implementation included various forms of worker and asset tracking that matched—based on their location—workers with other workers, or workers with assets (e.g., field equipment, vehicles, etc.), monitored and tracked worker/asset locations on a map, and provided associated capabilities such as navigation and various forms of location-based alerts. My work developing the product concept and initial requirements sets heavily emphasized the

tracking and alert capabilities for those applications. My work also included leading the development of the underlying network and Information Technology architectures that would be required to support the LBS applications product strategy and roadmap, including the future incorporation of other capabilities including Wi-Fi.

12. From 2000 to 2002, still as an Associate Partner at Accenture, I helped lead the business and technical development of several “dot-com” startups. Several of these startups heavily relied on the internet and internet browser capabilities as core parts of their technical and business platforms, including using the use of cookies for various purposes, particularly user identification and user-specific/personal data collection. In addition, my work included assisting several of these startups in developing/implementing their marketing/advertising campaigns (often a critical component of the success of a dot-com startup), from macro techniques (e.g., mass marketing) to micro techniques (targeted at particular demographics or even individuals).

13. In 2003 and 2004, I led the development of part of AT&T Wireless’s E911 infrastructure, including the development of systems, processes, and reporting infrastructure to manage and track the deployment of time difference of arrival-based location determination technologies. I managed the testing and Federal

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Communications Commission reporting of network location inaccuracies, with a particular focus on detecting and troubleshooting out-of-norm technology deployment and inaccurate location conditions. This work also generated the accuracy data associated with determining the location of a portable electronic device that could then be used as supplemental information (e.g., how accurate the location was) to location-based applications, such as asset tracking, navigation, POI information, and people-finding services.

14. From 2005 to 2007, I worked with NAVTEQ (now called HERE)—the leading provider of map data and services essential to creating LBS applications—to develop the company’s web developer website content and tools. Specifically, I designed and managed the site map and overall content, including the development of comprehensive technical and business web content for all NAVTEQ map product and service lines. Through the developer site, application developers and business managers became intimately familiar with map data, Geographical Information System (GIS) platforms, and location-based services and associated user interface and associated data population options available to successfully develop and launch their LBS applications. For example, I developed content for highlighting key types of map data and for providing technical details on how NAVTEQ tools could be used in LBS design for various consumer and business applications, for example,

data product packages focused on shopping and consumer Points-of-Interest (POIs), such as retail/retail locations, restaurants and entertainment spots, which could be used by application developers for a variety of purposes, such as retail location local search, and navigation packages focused on different levels of navigation granularity (e.g., malls vs. highways vs. backroads vs. trails) and modes of transportation (e.g., walking, truck, car, bike) across many forms of tracking and user interface platforms. Much of this map data productization involved links to/dependencies upon the types of location determination technology/techniques, including GPS, cellular network-based techniques, Wi-Fi positioning/networks, Cell ID-based, and other networks/techniques.

15. I also have extensive LBS application product design and implementation experience, including related disciplines including data privacy and security management. For example, from 2007 to 2010, in the role of lead Product Realization Manager, I managed the design, implementation, and launch of several consumer and business-oriented LBS applications for AT&T (then, AT&T Mobility). These LBS applications included navigation, mobile social networking, family monitoring and tracking and associated safety and surveillance capabilities, local search, 411-with-LBS, games, mobile resource management, fleet management and tracking, and asset tracking. I also developed corporate-wide

location data privacy policies and associated system implementation for all LBS customers. The app had to work within the constraints and capabilities of the literally dozens of phone/device platforms, and also within the constraints and capabilities of the rest of the AT&T IT, network, and operational (sales, customer service, etc.) systems, architecture and processes. I am a named inventor on several patents involving location and associated data privacy.

16. Many of the above apps involved extensive alerts associated with location-related triggers, such as entering/exiting an area (also referred to as “geofencing”), as well as using multiple location determination technologies and techniques. For example, my work in AT&T’s implementation of mobile social networking focused on finalizing the design of the Loopt social networking application, an app being adapted into AT&T’s network and product line. This role and work required extensive knowledge of how the app worked (including its use of location data sharing mechanisms and associated capabilities such as geofences). The role required design modifications to ensure successful implementation across multiple users/friends using different device platforms (and thus differing screen and functional capabilities) so that friends’ shared user experience was as accurate and complete as possible. This would include synchronization/coordination of location-alerts, enabling for example joint alerts when friends were nearby or at a certain POI,

and provided directions for enabling the friends/users to meet, as well as development and implementation of location sharing privacy policies to ensure location information was shared with the correct people at the correct level of detail. Many of these applications utilized mobile browsers to collect data and deliver key capabilities to users.

17. My work in asset and fleet tracking and management also extensively used location-based alerts, historical and real-time tracking, telematics and associated sensor monitoring, and boundary area/geofence-type capabilities. For example, the fleet management systems could alert centralized dispatch, and local control systems, when certain location, location area/geofence, and driving-related behavior events occurred, such as speeding in a certain speed limit area, or notifying dispatch (and the driver) when the driver/vehicle was within a certain distance of its destination or were in areas they should not be in and vice versa. The AT&T apps above utilized various forms of location determination, including GPS, WiFi, Cell Tower, and TDOA.

18. Further, these applications had to be tied into (and be used by) AT&T's network, AT&T's location infrastructure, and various AT&T IT systems used for functions including Sales, Customer Care, Fulfillment, Billing/Accounts Receivable, and various network and IT operations. The work also included

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extensive work with AT&T Legal to develop and implement AT&T's location privacy and data security policies. The integration of the application into the above required extensive authorization-related design work to ensure that a given user could appropriately access the various AT&T systems and subsystems, as well as the application, under the appropriate conditions/circumstances, including appropriately authorizing the use of and the sharing of a user's location with other users and/or systems. This work in location-related data security and privacy networking resulted in a patent: U.S. Patent 8,613,109, titled "*Method and Apparatus for Providing Mobile Social Networking Privacy*," that issued on December 17, 2013, of which I was the only non-employee inventor. I also hold other patents involving location privacy.

19. Finally, as part of my Lead Product Realization manager and Product Owner for several of these products, I worked extensively with Marketing to develop and implement marketing/advertising campaigns for these products—a particularly critical activity for a new product launch, particular products based on a new technology capability (e.g., the products being the first location products launched by AT&T).

20. Since 2010, I have served/am serving as a mobile/wireless and location technology and application/system expert in patent matters involving over 200

patents ranging from short and long-range network design, location-enabled use case design, and identification, authentication, privacy and security, to local, remote, and decentralized and centralized control systems, to safety, security, and surveillance systems, and have been deposed in approximately 75 such matters. I have testified over a dozen times in ITC court, the Eastern and Western Districts of Texas, and international (Canada and Trinidad and Tobago) venues, as well as various U.S. criminal courts.

21. Since 2015, I have served/am serving as a mobile location forensics expert in over 50 criminal (homicide, arson, robbery, etc.) and civil (trade secrets, product liability, etc.) cases, many involving various forms of vehicle telematics and otherwise tracking of individual movements and associated behaviors, using a variety of devices and platforms, possibly associated with the committing of a crime or other infraction, utilizing a variety of data including location information, video/camera data, and various sensor-based data.

22. In addition to the above applications, enabling location technologies, wireless communications, and privacy and security experience and expertise and other topical expertise described above, I also have many years of Information Technology experience. For example, as a consultant in the Information Technology practices of Deloitte Consulting (originally Touche Ross), Booz Allen & Hamilton,

and Andersen Consulting (now Accenture), I served in key technology development and technology leadership roles in numerous projects designing and implementing mainframe, mini-computer, and client-server-based computing systems across a wide variety of industries and a wide variety of functions/applications, operating systems and user interfaces.

23. I also led the design and development of a number of different communications networks associated with the above computing systems, including wide- and local-area networks, utilizing both wired and wireless technologies, involving private and public (e.g., internet-based) communications backbones.

24. I have authored multiple books on wireless location, including:

- The Definitive Guide to GPS, RFID, Wi-Fi, and Other Wireless Location-Based Services (2005 and 2009 versions);
- The Definitive Guide to Wireless E911 (2004, 2005 versions); and
- The Definitive Guide to Mobile Positioning and Location Management (co-author).

25. I have written numerous articles on wireless location, describing numerous aspects of the various disciplines/fields involved in this matter. I am also the primary/sole inventor of several patents extensively determining, tracking, and utilizing the locations and contexts of networks of devices, platforms, people, places,

and entities in supporting those attempting to control/modify/correct/improve various undesired activities and behaviors, such as those suffering from addiction or those in difficulty with the law on issues related to such behaviors, utilizing a wide array of sensor systems and long and short-range networks to collect and transmit data, and to locally and centrally generate alerts and various responses under a wide variety of contextual and location-based events and triggers.

26. I am the sole or lead inventor for 12 patents using location, context, and various sensors, IT and network capabilities for monitoring, tracking and modifying user behavior. These patents are listed on my CV.

27. My *curriculum vitae* attached as Exhibit 1 to this declaration contains further details on my education, experience, publications, and other qualifications to render an expert opinion. My work on this case is being billed at my normal hourly rate of \$485 per hour, with reimbursement for actual expenses. My compensation is not contingent upon my testimony or the outcome of these *inter partes* review proceedings.

III. MATERIALS REVIEWED

28. The opinions contained in this Declaration are based on the documents I reviewed, my professional judgment, as well as my education, experience, and

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knowledge regarding systems and processes in the field of user interface technologies.

29. In forming my opinions expressed in this Declaration, I reviewed the following materials:

Ex. 1001	U.S. Patent No. 7,057,09 (“the ’509 patent”)
Ex. 1004	Prosecution History of U.S. Patent App. No. 10/881,975
Ex. 1005	U.S. Patent No. 7,439,847 (“Pederson”)
Ex. 1006	U.S. Patent No. 7,212,113 (“Zanovitch”)
Ex. 1007	U.S. Patent No. 7,227,569 (“Maruya”)
Ex. 1008	U.S. Patent No. 6,456,234 (“Johnson”)

30. I also considered any other documents and materials I refer to in this Declaration.

31. My opinions contained in this declaration are based on the documents I reviewed and my knowledge and professional judgment. My opinions have also been guided by my appreciation of how a person of ordinary skill in the art would have understood the state of the art, the prior art, and the claims and the specification of the ’509 patent at the time of the alleged invention, which I discuss below.

32. I have been asked to consider that the time of the alleged invention of the ’509 patent was around 2004 (including and up to June 29, 2004), which

corresponds to the filing date of the earliest application associated with the '509 patent.

33. Based on my experience and expertise, it is my opinion that certain references disclose and/or suggest all the features recited in challenged claims of the '509 patent, as I discuss in detail below.

IV. PERSON OF ORDINARY SKILL IN THE ART AND THE TIME OF THE ALLEGED INVENTION

34. I am familiar with the level of ordinary skill in the art regarding the '509 patent as of around June 29, 2004. Considering the '509 patent, the technology, the educational level and experience of workers in the field relating to the patent, and problems and solutions in that field, and drawing on my own experience, I believe a person of ordinary skill in the art at the time of the alleged invention (around June 29, 2004) would have had an undergraduate degree in computer science, computer engineering, electrical engineering, or a related field along with two years of work experience in the field of information technology systems, including e.g., monitoring systems, identification systems, and tracking systems. More education can supplement practical experience and vice versa.

35. My opinions in this Declaration regarding the '509 patent and the prior art (including the state of the art) are from the perspective of one of ordinary skill in

the art as I defined above, during the relevant timeframe (e.g., the time of the alleged invention), which I discussed above as being around June 29, 2004.

V. TECHNICAL BACKGROUND

36. Below, I present a brief overview of certain aspects of systems and processes relating to monitoring, tracking, and identification systems around the time of the alleged invention for the '509 patent. The functionalities and concepts I describe below in this technical background section reflect the state of the art that a person of ordinary skill in the art would have had knowledge of and understood prior to and at the time of the alleged invention of the '509 patent. I rely on, and incorporate as applicable (even if not expressly mentioned below in Section IX), the following disclosures and opinions to support my opinions in this Declaration, including those opinions relating to how the prior art discloses and/or suggests the challenged claims of the '509 and how and why a person of ordinary skill in the art would have been motivated to consider and combine the disclosures and suggestions from that prior art as I explain below in Section IX. The concepts below would have been within the knowledge and mindset of a person of ordinary skill in the art at the time.

37. As the '509 patent admits, monitoring systems were known before the time of its alleged invention. (Ex. 1001, 1:13-22.) Such monitoring systems could

identify and track objects. (*Id.*, 1:19-45.) For example, systems were known that could identify, recognize, and provide real-time information concerning persons or vehicles. (*See* Ex. 1005, 3:4-15.) Such systems could be “utilized within a particular defined security zone or zones to track the entry, exit and location of vehicles and individuals.” (*Id.*, 7:1-6.) It was known to use cameras and other sensors to obtain tracking and identification information. (*Id.*, 7:47-58.) Such information could be stored, indexed by identification information (e.g., for a vehicle, by license plate number). (*See id.*, 16:35-38.)

38. Aside from optical systems, it was known to monitor objects using other systems. For example, it was known to track passenger and baggage in an airport environment using a system of threat scanning machines and walk through metal detectors. (*See, e.g.*, Ex. 1006, 20:57-67.) In those environments, the passenger’s identification could be merged with the baggage information so that the airport security system could be aware that baggage being tracked was associated with a particular passenger. (*See id.*, 20:38-44, 25:22-27.)

39. It was also known to compare current information about the monitored object (e.g., vehicle, person, baggage) with prior information about that same monitored object. For instance, the current activity of a vehicle or person could be compared against prior activity for that same vehicle or person to look for

discrepancies. (*See* Ex. 1005, 9:45-55, 16:50-55, 18:28-33, 19:17-33, 21:45-22:12.)

And, similarly, in an airport environment, monitored information about baggage such as its weight at various locations can be compared to search for changes that may cause security concerns and trigger an alert. (*See* Ex. 1006, 18:63-67, 20:11-14, 21:36-44, 21:63-22:29, 24:34-46.)

VI. THE '509 PATENT

A. Overview of the '509 Patent

40. The '509 patent relates to “methods and system for monitoring an object” using “identification data and tracking data.” (Ex. 1001, 1:8-11.) The '509 patent admits that monitoring systems that identify objects were known and so were monitoring systems that track objects. (*Id.*, 1:13-46.) But the '509 patent contends that such tracking systems “tend to assign tracking identifiers to each monitored object” that “usually are unrelated to the real identity of the monitored object.” (*Id.*, 1:13-46.)

41. The '509 patent purportedly discloses “a monitoring system [that] merges a tracking system and an identification system to obtain the desired level of accuracy and flexibility.” (*Id.*, 2:46-48.) As shown in Figure 2, a monitoring unit 10 can receive tracking and identification data for an object from a tracking system and an identification system, respectively, and “merge” the identification

information with the tracked information to create monitoring data for the monitored object. (*See id.*, 5:6-28, Fig. 2.) Identification information may include an “identity” of the monitored object and tracking information may include “description of the tracked object.” (*Id.*, 6:16-24.)

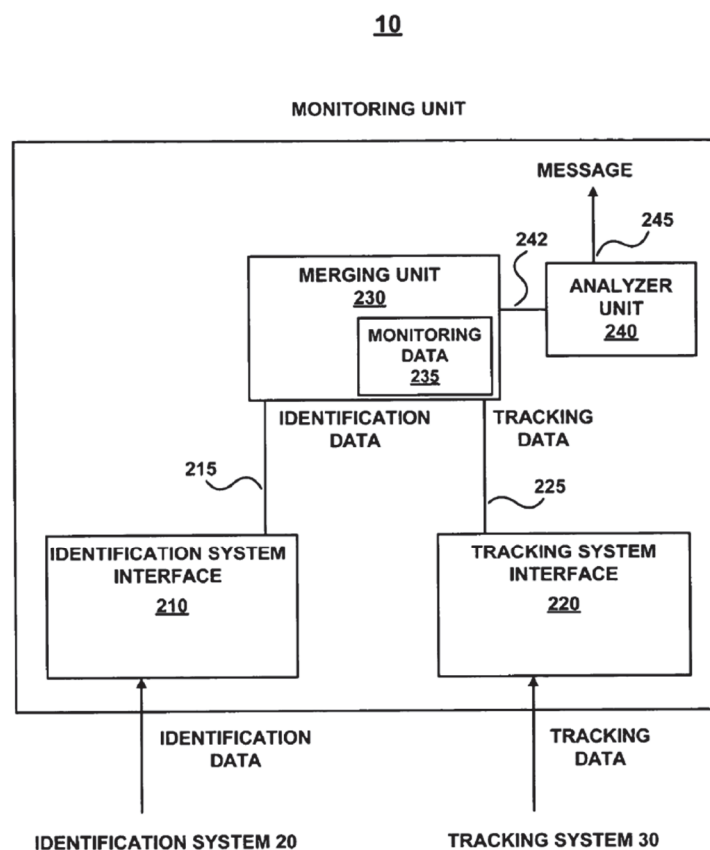


FIG. 2

(*Id.*, Fig. 2.)

42. Identification system 20 can be human-assisted such as “a police officer that checks the passport number from the people passing through a security point,” or automated such as an RFID tag reader. (*Id.*, 4:11-26.) Tracking system 30 can be, for example, non-invasive sensors (e.g., cameras) or invasive sensors such as radio frequency sensors. (*Id.*, 2:50-61, 3:55-63.) The tracking and identification systems monitor an object in a “monitored environment.” (*Id.*, 3:1-3.)

43. The '509 patent primarily describes applications related to security. (*See, e.g., id.*, 4:16-18, 4:39-45, 5:62-64, 9:22-10:46.) The system can be used, for example, in an airport to identify and track a passenger, including for comparing the monitoring data for that passenger to determine a change in their baggage. (*See id.*, 9:22-10:46, Fig. 8.) For example, Figure 8 shows an application where a monitored object is passenger 37, John Smith. (*Id.*) At time 1 ($t=T1$), John Smith is at gateway 1 and the identification system determines that he has two bags (#suitcases: 2). (*Id.*) Then at time 2 ($t=T2$), John Smith is at gateway 2 and the identification system determines that he has only 1 bag (#suitcases: 1). (*Id.*) By comparing the current monitoring data from $t=T2$ with the prior monitoring data from $t=T1$, the system determines that #suitcases changed (i.e., John Smith, now with one bag instead of two) and creates a warning message 870 reflecting that changed monitoring data. (*Id.*)

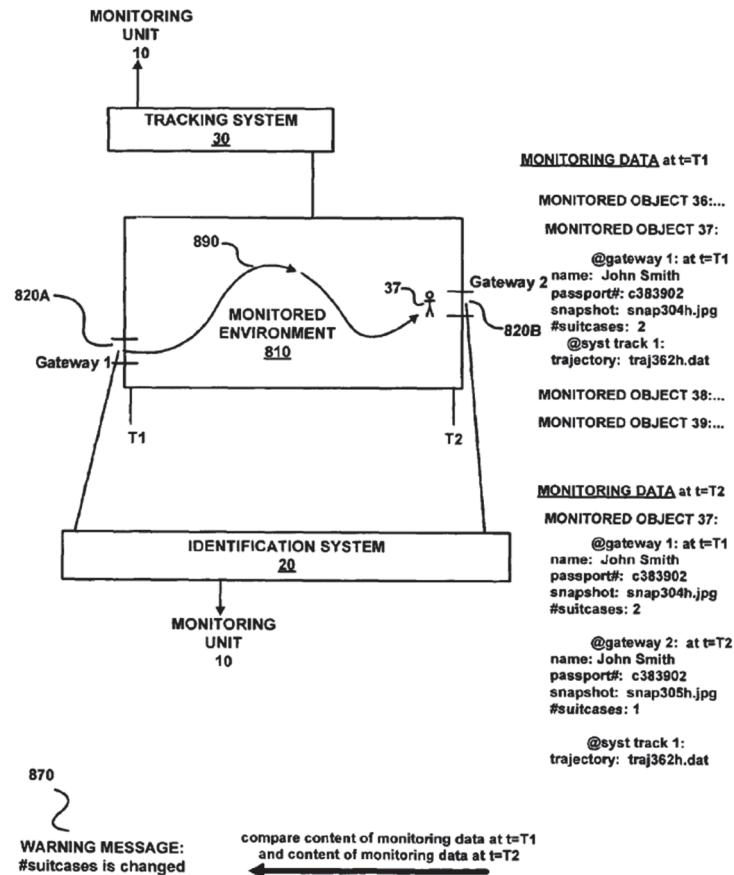


FIG. 8

1.

(Ex. 1001, Fig. 8.)

44. In my opinion, the challenged claims are a compilation of known and conventional components and features that are disclosed or suggested by the prior art combinations that I discuss herein.

B. Prosecution History

45. I have reviewed the prosecution history for U.S. Patent Application No. 10/881,975 (Ex. 1004), which issued as the '509 patent (Ex. 1001, Cover). That application was filed on June 29, 2004. (Ex. 1001, Cover.) It does not claim priority to any earlier-filed patent application. (*Id.*)

46. During prosecution, the United States Patent and Trademark Office (the "Office") issued only one office action. The Office rejected pending claims 1, 2, 9, 10, 17-21, 28 and 29 as anticipated by pre-grant publication No. US 2005/0088320 to named inventor Kovach, and objected to the remaining claims as allowable but depending from a rejected claim. (Ex. 1004, 372-377.) The Office did not identify any specific claim elements in those allowable claims that were not taught by the prior art. (*See id.*) The accompanying Notice of References Cited listed only three references. (*Id.*, 378.) And the applicant, who had not previously submitted an IDS, submitted only a single IDS following that rejection, which listed just five additional references. (*Id.*, 291.)

47. In response to the rejection, on March 13, 2006, the applicant amended the independent claims to include limitations pertaining to comparing new content of monitoring data of a monitored object with prior content of said monitoring object as recited in some of the dependent claims deemed allowable in the Office Action.

(*Id.*, 285.) The Office then allowed the claims without any accompanying explanation. (*Id.*, 265.). In my opinion, the Office erred in allowing at least claims 17-21 and 24-28² because the broadly worded “comparing” limitation was in the prior art.

VII. OVERVIEW OF THE PRIOR ART

A. Zanolitch (Ex. 1006)

48. Zanolitch relates to a system using a plurality of threat scanning machines and walk through metal detectors to track information associated with passengers and items, such as passengers in an airport and their baggage. (Ex. 1006, Abstract, 19:49-61.) With respect to Figure 39 (reproduced below), the system includes “a tracking and analysis module 3910, which includes an item tracking module 3912, a passenger tracking module 3914, an analysis module 3916, an alarm module 3918, and a report module 3922.” (Ex. 1006, 18:63-19:1.) In general, “[t]he tracking and analysis module 3910 is connected to one or more command and control centers within the network of command and control centers 3980 (illustrated in FIG.

² I have not been asked to opine on the remaining claims of the ’509 patent and have not formed any opinions about those claims.

Declaration of David Hilliard Williams
U.S. Patent No. 7,057,509

1),” which are directly or indirectly “connected to one or more threat scanning machines [(TSM)] 106, walk through metal detectors (WTMD) 3950,” or any “information acquisition and/or data entry system that can be used to receive information that can be utilized to track one or more of items and passengers.” (*Id.*, 19:1-12.)

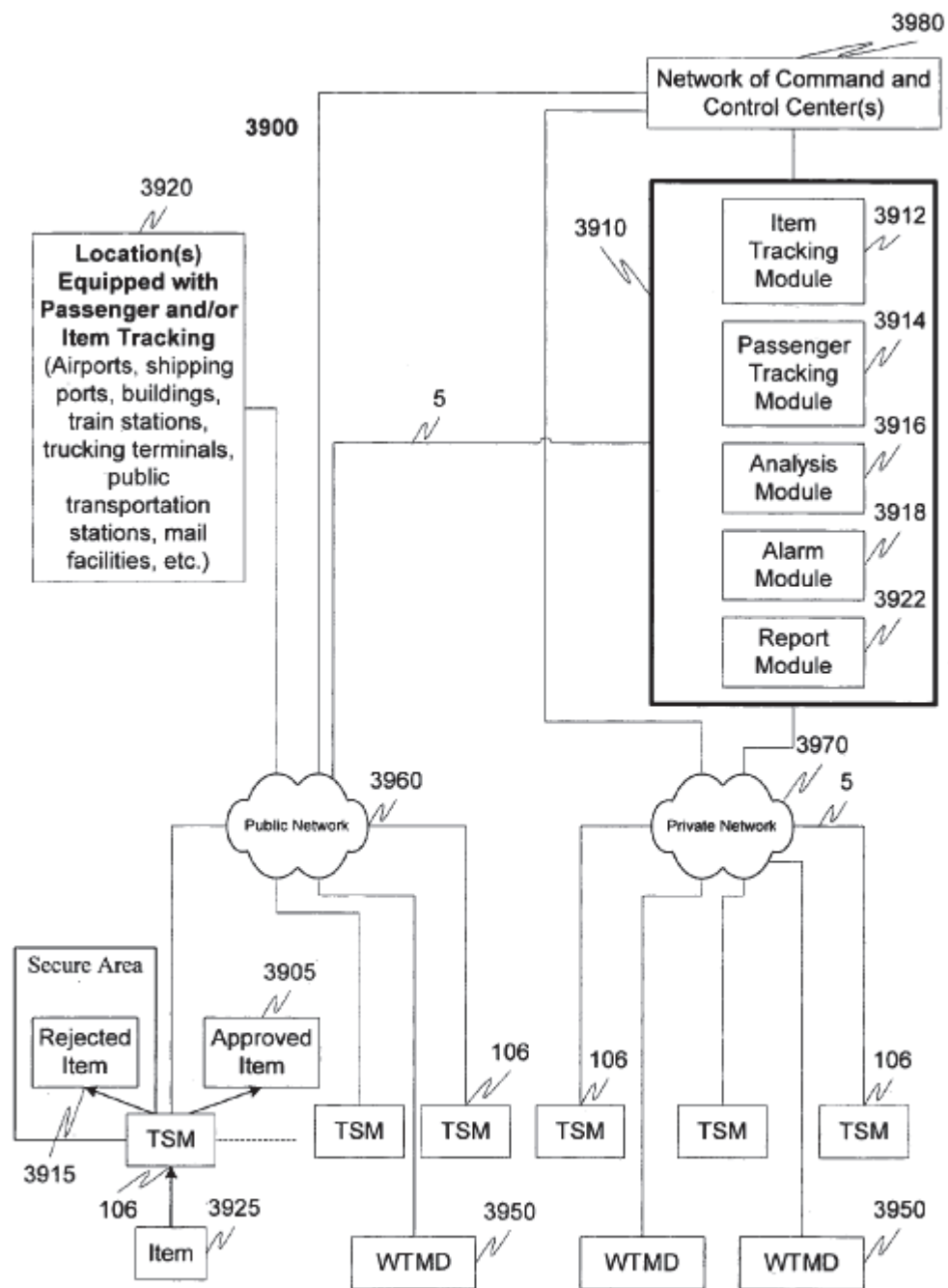


Fig. 39

(Id., Fig. 39.)

49. In an example use case of this system, a passenger is associated with their baggage, such as when they check in at the airport ticket counter. (*Id.*, 20:24-38.) The passenger and baggage are also identified, and “the item tracking module 3912 and passenger tracking module 3914 are updated with the item and passenger identification(s), respectively.” (*Id.*, 20:38-41; *see also id.*, 25:22-27.) That baggage information is linked to the passenger in the system’s data. (*Id.*, 20:41-44 (“For example, the item tracking module 3912 and passenger tracking module 3914 can store information indicating that ‘Passenger X’ has 2 checked bags and one carry on.”).)

50. As the passenger and his carry-on baggage move through the airport (or in and between multiple airports), they are tracked via a system of threat scanning machines 106 and walk through metal detectors 3950. For example, at the airport security checkpoint, a “walk through metal detector 3950 can be equipped with a passenger identification scanning device” that “forwards information to the passenger tracking module 3914.” (*Id.*, 20:57-67.) And a threat scanning 106 “obtains the item tracking identification associated with the scanned baggage and forwards the result of the threat scanning to the item tracking module 3912,” which includes baggage information such as “weight, contents, dimensions, or the like.”

(*Id.*, 20:39-56.) That passenger and item information is stored and indexed. (*Id.*, 21:1-4.)

51. After check-in and security, passengers and their items are subsequently tracked within the airport system. (*See, e.g., id.*, 24:17-26.) The system can also compare current passenger and baggage information to prior information and trigger an alert if a threat is detected. (*See, e.g., id.*, 25:10-21, 25:27-36.) As one example, a change in the weight of a carry-on bag may be detected as a threat:

the passenger tracking module 3914 and item tracking module 3912 can cooperate with, for example, threat scanning machines 106 that are placed at the entrance of the airplane and can collect information related to one or more of items and passengers immediately prior to boarding. The analysis module could then perform an analysis between when the baggage went through a previous security checkpoint and the passenger/item bag as it is loaded onto the airplane. For example, a comparison can be made between the weight of a carry-on bag at the security check point and the weight of the carry-on bag at the airplane. If a difference exists, there may be sufficient cause to send an alert and or alter a risk level.

(*Id.*, 24:34-46.)

B. Pederson (Ex. 1005)

52. Pederson relates to “[a]n intelligent video/audio observation and identification system” that “identif[ies] vehicles and individuals entering or exiting [a security] zone through image recognition of the vehicle or individual as compared to prerecorded information stored in a database.” (Ex. 1005, Abstract.) The system then “track[s] individuals or vehicles within a zone or between zones.” (*Id.*) By comparing observed data to previously stored data, the system can also identify discrepancies and generate alerts. (*Id.*, 19:26-33.)

53. For example, Pederson discloses using input devices 12 (cameras) and 18 (“fingerprint scanners, palm scanners, microphones, retinal scanners, and the like”) at a checkpoint like that shown in Figure 2 to identify individuals and vehicles entering a security zone 50. (*Id.*, 7:59-8:2, 9:18-11:6, Fig. 2.) The system “receives data from all input devices 12, 18 for processing for identification” and that data is “stored within a continuously evolving database 30.” (*Id.*, 10:1-4; *see also id.*, 9:19-32.)

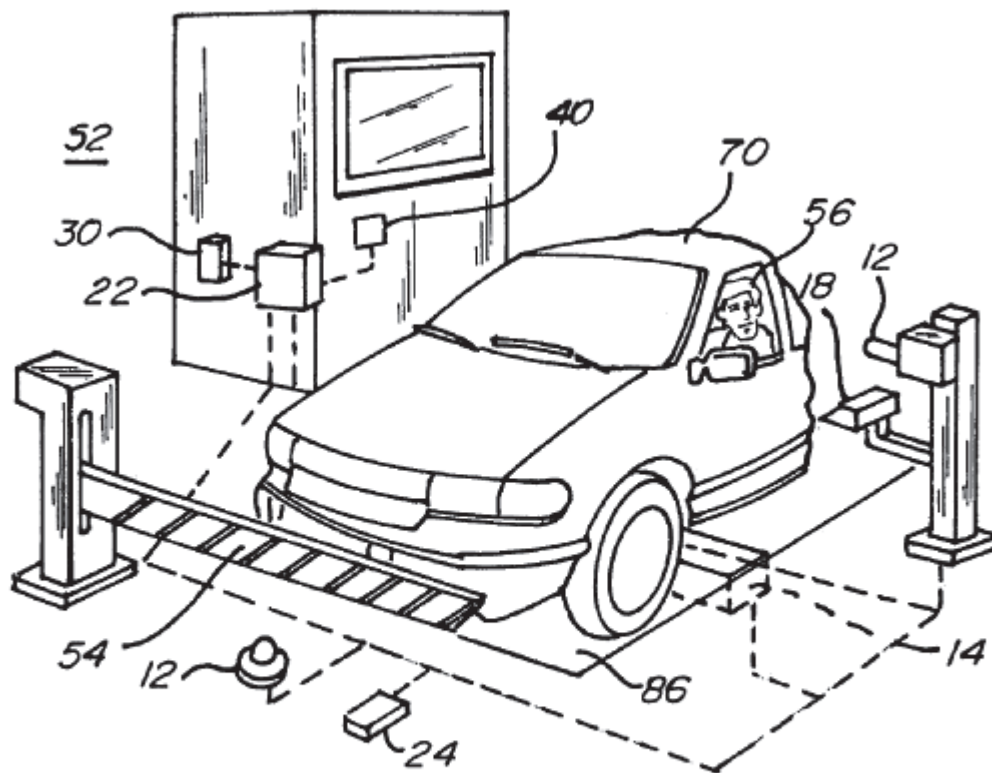


Fig. 2.

(*Id.*, Fig. 2.)

54. Within a security zone, Pederson's system tracks the identified individuals and vehicles "through the use of a plurality of optical sensors which may be cameras" that are each similarly "linked to a continuously evolving database to record information." (*Id.*, 7:47-55; *see also id.*, 19:34-39 ("A computer 22 may further track vehicles 70 or individuals 56 within the security zone 50 to identify the

at rest position of the vehicle 70 or location of the individual 56 within the security zone 50. In addition, the computer 22 will track the subsequent repositioning of a vehicle 70 or individual 56 within a security zone 50.”.)

55. Pederson stores the identification and tracking information “within the database 30 pertaining to the vehicle 70 or individual 56” using a classification system “such as by license plate 54, and other retrieved identification information.” (*Id.*, 16:35-38.) This recorded data is used “to build vehicle 70/individual 56 specific files or histories.” (*Id.*, 19:22-26.) Thus, new tracking and identification data is added to the file history for a given previously identified vehicle or individual. Pederson’s system can then “compare current vehicle 70 or individual 56 activity against previously stored and recorded activity data to establish standard deviations or thresholds which may, in turn, trigger a signal or warning if current conduct is outside acceptable parameters.” (*Id.*, 19:26-33; *see also id.*, 9:46-55 (“the computer 22 receives data independently from one or more input devices 12, 18 for analysis against pre-stored and/or prerecorded data in the database 30 related to the vehicle 70 and/or individual 56”), 16:50-55.) Such a comparison can be done by, for example, normalizing the historic data related to an individual 56 and/or vehicle 70 and comparing the current data for that individual/vehicle to the normalized data that represents their historic actions. (*Id.*, 19:18-26.)

C. Maruya (Ex. 1007)

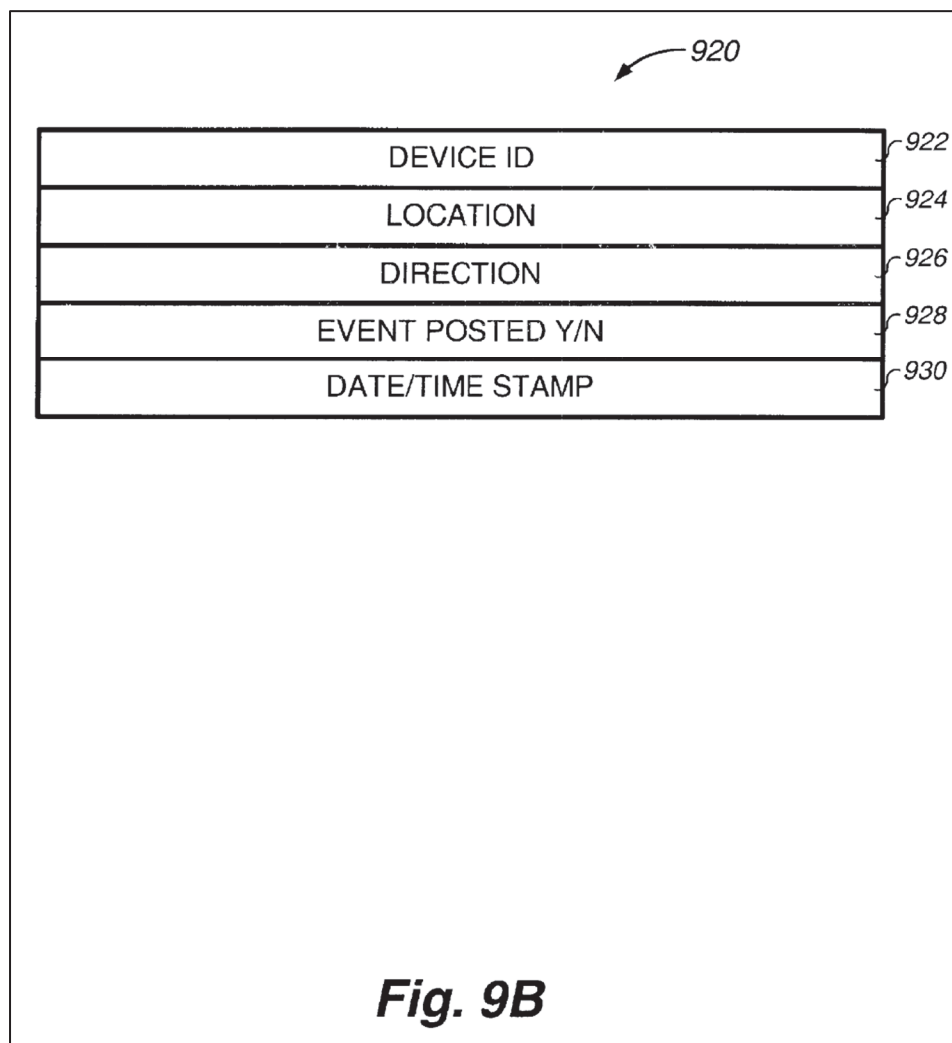
56. U.S. Patent No. 7,227,569 (“Maruya”) issued June 5, 2007, from an application filed May 6, 2003. (Ex. 1007, Cover.) Maruya describes a surveillance system in which “a plurality of surveillance camera units” acquire an image of a movable object. (*Id.*, Abstract.) The system Maruya disclosed “makes it possible to keep track[] of a target [object] even in a space including one or more blind spots” where a camera loses track of the object. (*Id.*)

57. It does so by extracting information about the features of the object that are used to identify the object. (*Id.*, 3:59-4:39, 7:19-28.) Then that system compares the images from a camera to the extracted features (using comparing means 13) to determine if the target is present within the camera view. (*Id.*, 5:13-6:3.) When the target is not detected on the tracking camera, it assumes the target has disappeared from view. (*Id.*, 6:29-34; *see also id.*, 7:29-59.) In response, the system transmits the feature information to other cameras, and when any camera detects the target by matching it to the stored features, thereby determining the newly acquired target is the same one previously identified, that camera starts transmitting video of the target. (*Id.*, 6:35-67; *see also id.*, 7:60-8:3.)

D. Johnson (Ex. 1008)

58. U.S. Patent No. 6,456,234 (“Johnson”) issued September 24, 2002, from an application filed June 7, 2000. (Ex. 1008, Cover.) Johnson “relates generally to location dependent delivery of information to mobile data processing systems, and more particularly to a system for pushing Situational location dependent content to data processing system devices traveling to locations for, or in directions of, that place which delivery content is designated as deliverable.” (*Id.*, 1:19-25.) In particular, it describes using the location of a user (including changes in location or direction of movement) to deliver content such as advertising, emergency services, or other information to a user device that it calls a “receiving data processing system” or “RDPS.” (*Id.*, 2:10-4:26, Figs. 3B and 3C (posting content to user device based on changes in position or direction).)

59. Johnson tracks and saves the user’s location information using location history data files, such as those shown in its figure 9B (reproduced below). (Ex. 1008, 10:8-13; 15:60-61 (“FIG. 9B depicts a preferred embodiment of a data record in the location history data of the present invention.”).) The location history data associates a device ID (field 922) with the tracking information for that device (e.g., fields 924, 926, and 930) and saves them together in the same data record. (*Id.*, 15:60-16:4; Fig. 9B.)



(Ex. 1008, Fig. 9B.)

VIII. CLAIM CONSTRUCTION

60. I understand that when considering the meaning of patent claims, one must consider the language of the claims, the specification, and the prosecution history of the patent. I also understand that claim terms are typically given their ordinary and customary meanings as would have been understood by a person of

ordinary skill in the art ordinary skill in the art at the time of the invention for the patent. For purposes of my opinions in this declaration, I have been asked to consider the challenged claims under their plain and ordinary meanings as understood by a person of ordinary skill in the art at the time of the alleged invention (which I have considered to be around June 29, 2004, the filing date for the application that issued as the '509 patent). I have applied that plain and ordinary meaning in my analysis of the '509 patent and the prior art.

IX. THE PRIOR ART DISCLOSES AND/OR SUGGESTS ALL RECITED FEATURES OF CLAIMS 14-21, and 25-28 OF THE '509 PATENT

61. In my opinion, the prior art I discuss below discloses the limitations of claims 14-19 and 24-26, and discloses or suggests the limitations of claims 20-21 and 27-28.

A. Zanovitch Discloses Claims 14-19, and 24-26

1. Claim 17

i) [17.pre] “A method of monitoring an object, said method comprising:”

62. I understand that this limitation is a preamble of the claim, and I have been asked to assume that the preamble is limiting. Under that assumption, Zanovitch discloses the preamble of claim 17. For example, Zanovitch discloses a

method of identifying and tracking (“**monitoring**”) a bag (e.g., a passenger’s carry-on bag) (“**an object**”) as I discuss for the remaining limitations of claim 17.³

63. Zanolitch discloses that “[u]pon arrival at the security checkpoint a passenger generally places their carry-on baggage on a conveyor for scanning by a threat scanning machine 106,” which “obtains the item tracking identification associated with the scanned baggage and forwards the results of the threat scanning to the item tracking module 3912.” (Ex. 1006, 20:44-56.) Then,

the passenger tracking module 3914 and item tracking module 3912 can cooperate with, for example, threat scanning machines 106 that are placed at the entrance of the airplane and can collect information related to one or more of items and passengers immediately prior to boarding. The analysis module could then perform an analysis between when the baggage went through a previous security checkpoint and the passenger/item bag as it is loaded onto the airplane. For example, a comparison can be made between the weight of a carry-on

³ Claim language is bolded from here on.

bag at the security checkpoint and the weight of the carry-on bag at the airplane.”

(*Id.*, 24:34-44.)

64. Accordingly, Zanovitch discloses “[a] **method of monitoring an object.**”

- ii) [17.a] **“generating identification data associated with each monitored object located at an identification gateway of a monitored environment, wherein said generating identification data is performed by an identification system;”**

65. Zanovitch discloses this limitation. Zanovitch’s disclosed system is able to identify and track items (e.g., a passenger’s carry-on bag) (“**monitored object**”). For example, at the check-in counter (“**identification gateway**”) of an airport (“**monitored environment**”), “scanning equipment [] is capable of associating one or more item identifier ... with the item(s)” such as a passenger bag. (Ex. 1006, 20:24-37.) “Upon check-in, the item tracking module 3912” is “updated with the item ... identification(s).” (*Id.*, 20:39-41; *see also id.*, 19:62-66 (“Each item also needs to be identifiable.”).) Therefore, the “scanning equipment” is an “**an identification system**” that “**generat[es] identification data associated with each monitored object located at an identification gateway of a monitored**

environment, wherein said generating identification data is performed by an identification system.”

- iii) [17.b] **“generating tracking data associated with each monitored object located within said monitored environment, wherein said generating tracking data is performed by a tracking system;”**

66. Zanolitch discloses this limitation. “Upon arrival at the security checkpoint a passenger generally places their carry-on baggage on a conveyor for scanning by a threat scanning machine 106,” which “obtains the item tracking identification associated with the scanned baggage and forwards the results of the threat scanning to the item tracking module 3912.” (Ex. 1006, 20:44-56.) “These results can include ... any supplemental information regarding the baggage such as, for example, *weight*, contents, dimensions, or the like.” (*Id.* (emphasis added).)

67. The threat scanning machines 106 (TSM) are collectively **“a tracking system”** that generates **“tracking data”** (e.g., weight) associated with each **“monitored object”** (e.g., a passenger’s carry-on) **“located within said monitored environment”** (the airport).

- iv) [17.c] **“merging and storing said identification data and said tracking data of each monitored object to form monitoring data for each monitored object; and”**

68. Zanolitch discloses this limitation. Zanolitch discloses “a tracking and analysis module 3910” that includes *inter alia* item tracking module 3912, passenger tracking module 3914, and analysis module 3916. (Ex. 1006, 18:63-67, Fig. 39.) The item tracking module 3912 of the tracking and analysis module 3910 receives both the item identification and tracking data associated with that item (e.g., the weight of the item at the security checkpoint). (Ex. 1006, 20:39-55, 21:36-43.) This “item information” is “stored and indexed” in the tracking and analysis module 3910 for later access by the analysis module 3916 therein (discussed below in Section IX.A.1.v). (Ex. 1006, 21:1-4, 21:36-43, 21:63-22:3.) For example, the tracking and analysis module 3910 stores the “weight of a carry-on bag” at the security checkpoint, which is later compared to the weight of that same bag at the airplane by the analysis module 3916. (*Id.*, 24:34-44.)

69. Zanolitch thus discloses that the tracking and analysis module 3910 both stores and merges the identity (“**identification data**”) and the weight (i.e., “**tracking data**”) of each item such as a carry-on bag (“**each monitored object**”).

70. Zanolitch's disclosure is consistent with the '509 patent. The '509 patent discloses that **"merging"** identification and tracking data for an object encompasses at least associating the tracking data with a particular identified object (e.g., a person):

[T]he monitoring unit 10 merges and stores the identification data and the tracking data of each monitored object to form monitoring data for each monitored object. Before the identification data and the tracking data for each monitored object is merged, the monitoring system 100 interprets this data as representing tracking data for an object assigned the unique tracking identifier X and as identification data for an object identified as a person named John Smith. After the identification data and the tracking data for each monitored object is merged, the monitoring system 100 interprets this data as representing tracking data and identification data for a person named John Smith.

(Ex. 1001, 4:52-64.)

71. For the reasons discussed above, the tracking and analysis module 3910 in which identification and tracking data is associated with each item and stored and indexed discloses **"merging and storing said identification data and said**

tracking data of each monitored object to form monitoring data for each monitored object.”

- v) **[17.d] “comparing new content of said monitoring data of a monitored object with prior content of said monitoring data of said monitored object.”**

72. Zanolitch discloses this limitation. Zanolitch discloses that the tracking and analysis module 3910 includes “an analysis module 3916.” (Ex. 1006, 18:63-67, Fig. 39; *see also id.*, 21:36-44.) The analysis module 3916 processes the baggage identification and tracking information to compare new content of that information to prior content to determine if for example, the content of a passenger’s carry-on baggage has *changed* between an initial pass through a threat scanning machine (TSM 106) and subsequent analyses at other TSMs 106 such as those located at a boarding gate or a destination airport (“**comparing new content of said monitoring data of a monitored object with prior content of said monitoring data of said monitored object**”). (*Id.*, 18:63-67, 20:11-14, 21:36-44, 21:63-22:29, 24:34-44.) Zanolitch gives an example application of this comparison used for detecting a change in passenger’s carry-on baggage at the boarding gate:

[T]he passenger tracking module 3914 and item tracking module 3912 can cooperate with, for example, threat scanning machines 106 that are placed at the entrance of the airplane and can collect information related to one or

more of items and passengers immediately prior to boarding. The analysis module could then perform an analysis between when the baggage went through a previous security checkpoint and the passenger/item bag as it is loaded onto the airplane. For example, a comparison can be made between the weight of a carry-on bag at the security checkpoint and the weight of the carry-on bag at the airplane.”

(*Id.*, 24:34-44.) In the above example, the weight of the carry-on bag at the airplane is “**new content of said monitoring data of a monitored object**,” whereas the weight of a carry-on bag at the security checkpoint is “**prior content of said monitoring data of said monitored object**.”

73. This is similar to the Figure 8 embodiment of the ’509 patent. (*See* Ex. 1001, 9:22-10:22, Fig. 8.) There, monitoring unit 10 compares passenger and baggage information at two different locations to determine that the passenger had two suitcases at a first location but only had one suitcase at a second location. (Ex. 1001, 9:22-10:22.)

2. Claim 18: “The method as recited in claim 17 further comprising: processing said monitoring data.”

74. Zanolitch discloses this limitation. As I discussed above in Section IX.A.1.v, the “analysis module 3916” analyzes the item information, and is thereby,

“processing said monitoring data.” (*See also* Ex. 1006, 21:36-44 (“Once the item tracking module 3912 and passenger tracking module 3914 receive the item and/or the passenger identification, as well as information associated with that item and/or passenger, the analysis module 3916 *analyzes* information associated with the item, such as contents, . . . in an attempt to predict whether that item and/or passenger poses a threat.”).)

3. Claim 19: “The method as recited in claim 18 wherein said processing further includes: generating a message based on a result of said comparison of said new and said prior content.”

75. Zanolvitch discloses this limitation. For example, Zanolvitch discloses that “[t]he alarm module 3918 works in cooperation with the analysis module 3916 to send an appropriate alarm upon the analysis module 3916 determining that an alert is required.” (Ex. 1006, 23:66-24:1; *see also id.* 10:30-67 (describing content of alarm message); 25:31-62 (describing steps S140-S160 of Fig. 40 regarding sending an alert based on comparison).) Such an alert can be based on the comparison of new and prior content of the monitoring data. (*See, e.g., id.*, 24:42-46 (“[A] comparison can be made between the weight of a carry-on bag at the security checkpoint and the weight of the carry-on bag at the airplane. If a difference exists, there may be sufficient cause to send an alert....”).) An “alert” is a type of **message**.

4. Claim 14

i) [14.pre] “A computer-readable medium having stored therein a data structure comprising:”

76. I understand that this limitation is a preamble of the claim and I have been asked to assume that the preamble is limiting. Under that assumption, Zanolitch discloses the preamble of claim 14. For example, Zanolitch discloses that the identification and tracking data is stored and indexed in tracking and analysis module 3910 (“**a computer-readable medium having stored therein a data structure**”). (See my discussion above in §IX.A.1.iv.) Zanolitch further discloses that “the disclosed methods may be readily implemented in software executed on programmed general-purpose computer . . .” or “implemented by physically incorporating the system and method into a software and/or hardware system.” (Ex. 1006, 32:45-56; *see also id.*, 4:24-58.) A person of ordinary skill in the art would have recognized that a “programmed general-purpose computer” having a tracking and analysis module 3910 which stores and indexes identification data and tracking data discloses a “**computer-readable medium having stored therein a data structure**” (where the data structure is discussed below). Additional details are discussed below for the remaining limitations of claim 14.

ii) [14.a] **“A plurality of monitoring data groups, each monitoring data group associated with one of a plurality of monitored objects, wherein each monitoring data group includes:”**

77. Zanolitch discloses this limitation. For example, item tracking module 3912 of the tracking and analysis module 3910 receives both the item identification and tracking data associated with that item (e.g., the weight of the item at the security checkpoint). (Ex. 1006, 20:39-55, 21:36-43.) This “item information” for each item is “stored and indexed” in the tracking and analysis module 3910 for later access by the analysis module 3916 therein (**“each monitoring data group associated with one of a plurality of monitored objects”**). (Ex. 1006, 21:1-4, 21:36-43, 21:63-22:3; *see also* above at §§IX.A.1.iv-v.) For example, the tracking and analysis module 3910 stores the “weight of a carry-on bag” at the security check-point, which is later compared to the weight of that same bag at the airplane by the analysis module 3916. (*Id.*, 24:34-44.)

78. Each bag is separately identified. (*Id.*, 19:62 (“Each item also needs to be identifiable.”), 20:33-37.) So, a person of ordinary skill in the art would have understood that the “stored and indexed” “item information” for each bag forms its own data group in tracking and analysis module 3910, where the bag identification and tracking information forms a **“data group associated with one of a plurality**

of monitored objects” (e.g., one of a plurality of bags), and so the data groups for a plurality of bags in an airport setting (where it is well understood that more than one passenger would have a bag) would correspond to **“a plurality of monitoring data groups.”**

- iii) **[14.b] “identification data associated with a monitored object, wherein said identification data is generated when said monitored object is located at an identification gateway of a monitored environment;”**

79. Zanolitch discloses this limitation for the same or similar reasons as I discussed above for limitation 17.a. (See my discussion above in §IX.A.1.ii.)

- iv) **[14.c] “tracking data associated with said monitored object, wherein said tracking data is generated when said monitored object is located within said monitored environment; and”**

80. Zanolitch discloses this limitation for the same or similar reasons as I discussed above for limitation 17.b. (See my discussion above in §IX.A.1.iii.)

- v) **[14.d] “merged data that is based on the comparison of new content of monitoring data of a monitored object and prior content of said monitoring data of said monitored object.”**

81. Zanolitch discloses this limitation for the same or similar reasons as I discussed above for limitations 17.c and 17.d. (See my discussion above in §§IX.A.1.iv-v.)

82. I have been asked to consider a scenario where this limitation requires that the merged data reflects the result of the comparison. In that scenario, Zanolitch discloses that interpretation of the claim. For example, as I discussed above for limitation 17.d and claim 19, Zanolitch discloses comparing the weight of a carry-on bag at two different locations and sending an alarm based on the comparison. (See above at §§IX.A.1.v, IX.A.3; *see* Ex. 1006, 23:66-24:1 (“The alarm module 3918 works in cooperation with the analysis module 3916 to send an appropriate alarm upon the analysis module 3916 determining that an alert is required.”); 24:42-46 (“[A] comparison can be made between the weight of a carry-on bag at the security checkpoint and the weight of the carry-on bag at the airplane. If a difference exists, there may be sufficient cause to send an alert....”); 25:31-62 (describing steps S140-S160 of Fig. 40 regarding sending an alert based on comparison).) Zanolitch discloses that following the determination to issue an alert about “a suspicious item, information about the item can be retrieved and displayed each time the item identifier is detected. For example, the alert information or a derivative thereof can be displayed” (*Id.*, 25:31-56.) That information is **based on the comparison of new content of monitoring data and prior content of said monitoring data** for the item (**monitored object**), and data is “**merged**” at least because the alert information resulting from the comparison is associated with “the item identifier”

(*id.*, 25:45-47) (e.g., identification data); *see also* Ex. 1006, 10:30-67 (describing content of alarm message including “[i]dentification of the bag”).)

83. This is also consistent with the only disclosure I could find in the ’509 patent that may describe merged **“data that is based on the comparison ...”** The ’509 patent gives an example of comparing the monitoring data at two different locations for a passenger in an airport. (Ex. 1001, 10:8-22, Fig. 8.) In that example, monitoring data for the monitored object at two different times is compared and an alert is generated based off that comparison when, in the example given, the number of suitcases associated with the passenger changes. (*Id.*) Thus, if this limitation 14.d is interpreted as directed to that disclosure, then Zanolitch discloses this limitation.

5. Claim 15: “The computer-readable medium as recited in claim 14 wherein said identification data is generated by an identification system.”

84. Zanolitch discloses claim 15 for the same or similar reasons as I discussed for limitation 17.a. (See my discussion above in §IX.A.1.ii.)

6. Claim 16: “The computer-readable medium as recited in claim 14 wherein said tracking data is generated by a tracking system.”

85. Zanolitch discloses claim 16 for the same or similar reasons as I discussed for limitation 17.b. (See my discussion above in §IX.A.1.iii.)

7. **Claim 24**

- i) **[24.pre] “A computer-readable medium comprising computer-executable instructions stored therein for performing a method of monitoring an object, said method comprising:”**

86. I understand that this limitation is a preamble of the claim, and I have been asked to assume that the preamble is limiting. Under that assumption, Zanolitch discloses the preamble of claim 24 for the same or similar reasons discussed for claim elements 14.pre and 17.pre. (See my discussion above in §§IX.A.1.i, IX.A.4.i.) Zanolitch further discloses that “the disclosed methods may be readily implemented in software executed on programmed general-purpose computer . . .” or “implemented by physically incorporating the system and method into a software and/or hardware system.” (Ex. 1006, 32:45-56; *see also id.*, 4:24-58.) The software constitutes “**computer-executable instructions.**”

- ii) **[24.a] “generating identification data associated with each monitored object located at an identification gateway of a monitored environment, wherein said generating identification data is performed by an identification system;”**

87. Zanolitch discloses this limitation for the same or similar reasons as I discussed for claim limitation 17.a. (See my discussion above in §IX.A.1.ii.)

- iii) **[24.b] “generating tracking data associated with each monitored object located within said monitored environment, wherein said generating tracking data is performed by a tracking system;”**

88. Zanolitch discloses this limitation for the same or similar reasons as I discussed for claim limitation 17.b. (See my discussion above in §IX.A.1.iii.)

- iv) **[24.c] “merging and storing said identification data and said tracking data of each monitored object to form monitoring data for each monitored object; and”**

89. Zanolitch discloses this limitation for the same or similar reasons as I discussed for claim limitation 17.c. (See my discussion above in §IX.A.1.iv.)

- v) **[24.d] “comparing new content of said monitoring data of a monitored object with prior content of said monitoring data of said monitored object.”**

90. Zanolitch discloses this limitation for the same or similar reasons as I discussed for claim limitation 17.d. (See my discussion above in §IX.A.1.v.)

- 8. **Claim 25: “The computer-readable medium as recited in claim 24 wherein said method further comprises: processing said monitoring data.”**

91. Zanolitch discloses this limitation for the same or similar reasons as I discussed for claim 18. (See my discussion above in §IX.A.2.)

9. Claim 26: “The computer-readable medium as recited in claim 25 wherein said processing further includes: generating a message based on a result of said comparison of said new and said prior content.”

92. Pederson discloses this limitation for the same or similar reasons as I discussed for claim 19. (See my discussion above in §IX.A.3.)

B. Zanolvitch in view of Johnson Discloses and/or Suggests Claims 14-19 and 24-26

1. Claim 17

93. Zanolvitch discloses all limitations of claim 17 as discussed above, including merging and storing the identity (“**identification data**”) and the weight (“**tracking data**”) of each item such as a carry-on bag (“**each monitored object**”). (See above at §IX.A.1.iv.) Zanolvitch’s disclosure is consistent with the ’509 patent, which explains that “merging” is simply assigning or linking the identification data to the tracking data as opposed to using a tracking identifier that is unrelated to the monitored object’s identity. (*See id.*; Ex. 1001, 4:52-64.) Although Zanolvitch discloses claim 17, I have been asked to consider a scenario where that Zanolvitch does not expressly disclose “**merging and storing said identification data and said tracking data of each monitored object to form monitoring data for each monitored object**” (limitation 17.c). In that scenario, Zanolvitch in view of Johnson discloses or suggests that feature and a person of ordinary skill would have been

motivated, in view of Johnson, to configure Zanolitch to form monitoring data for each monitored object as claimed. As I discuss in this section, Zanolitch in view of Johnson discloses and/or suggests claim 17.

94. Johnson relates to monitoring identification and location information and is therefore in the same or a similar field to Zanolitch and the '509 patent. The '509 patent relates to monitoring an object “with identification and tracking data.” (Ex. 1001, Abstract.) The '509 patent gives example applications for object monitoring but does not limit such monitoring to any specific application or purpose. (*See generally* Ex. 1001.) As detailed below, Johnson monitors a receiver device, including using its identity and tracking information to decide when to push content to the receiver for various purposes. (Ex. 1002, ¶88; *see, e.g.*, Ex. 1008, 2:65-4:7 (describing exemplary applications for using tracking and identification to push content to the device).) Thus, the '509 Patent and Johnson both relate to using identification and tracking data for various purposes and are in the same or a similar field.

95. For example, Johnson discloses a system where content is delivered to a device based on information such as the device’s “location and/or direction change . . . or movement exceeding a movement tolerance.” (Ex. 1008, Abstract; *see also id.*, 1:19-26, 2:10-37 (disclosing using “location, direction, location and

direction, proximity to a location, state change, or location and/or direction relative to a previous location and/or direction, or combinations thereof” to determine whether to push content to a receiving data processing system (“RDPS”)), 7:30-31 (“As the RDPS moves about, positional attributes are monitored for determining a situational location.”).) With respect to Johnson’s figure 3B, Johnson discloses an example series of steps where (a) an RDPS’s location is determined (blocks 312-318), (b) its direction and distance traveled are determined by comparing current versus previous locations (blocks 324 and 326), (c) that tracking data is used to decide whether to push content to the RDPS (blocks 328, 330, and 332), (d) after which the location history of the RDPS is updated with a new entry (block 334). (Ex. 1008, 9:10-10:19, Fig. 3B.) These steps are continuously repeated. (*Id.*)

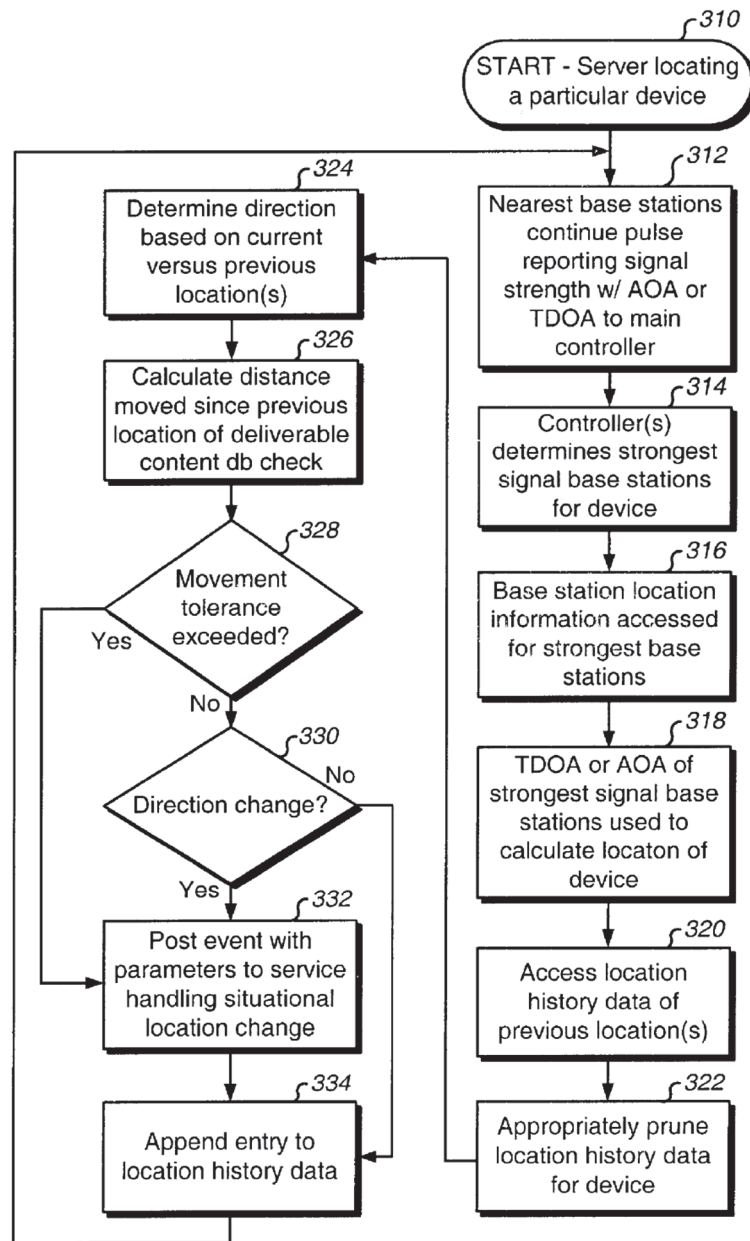
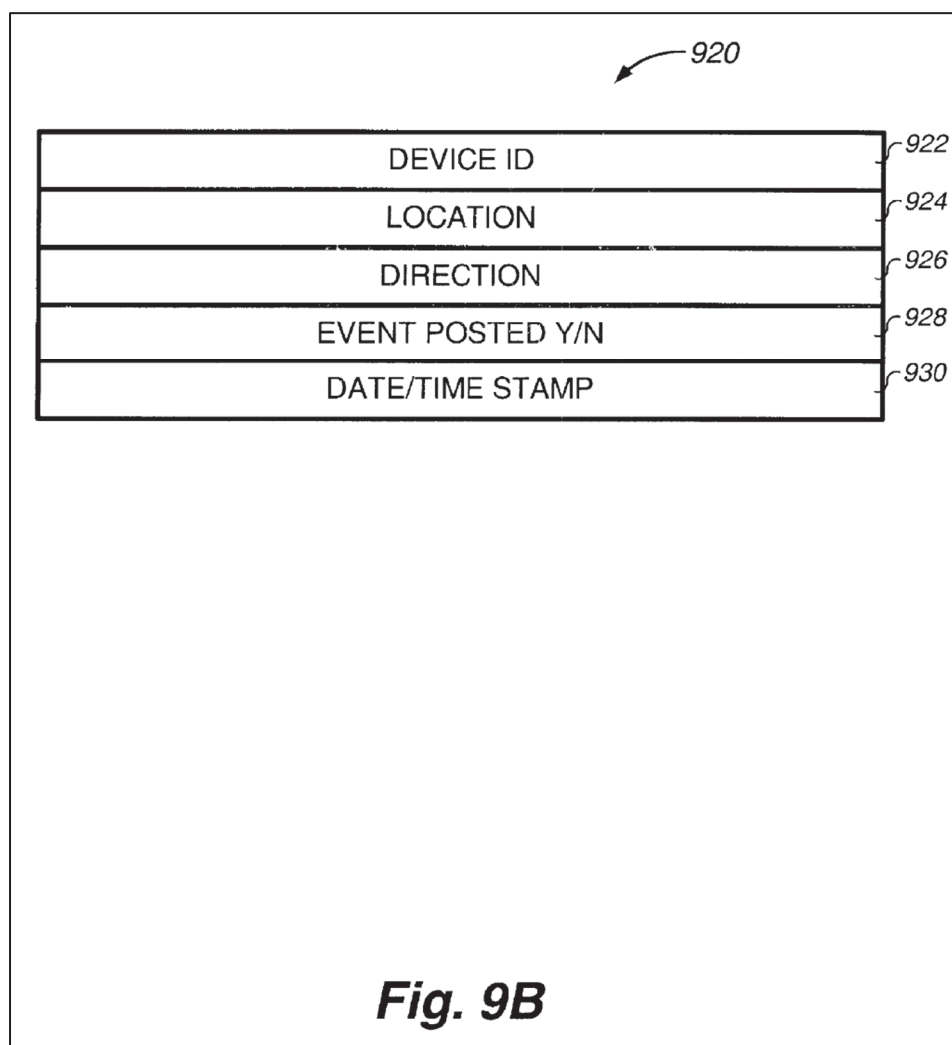


Fig. 3B

(Ex. 1008, Fig. 3B.)

96. Johnson discloses that the location history data preferably takes the form shown in its figure 9B (excerpted below). (Ex. 1008, 10:8-13; 15:60-61 (“FIG. 9B depicts a preferred embodiment of a data record in the location history data of the present invention.”).) That record tracks the travels of a particular RDPS. (*Id.*, 15:60-64.) The location history data associates a device ID (field 922) with the tracking information for that device (e.g., fields 924, 926, and 930) and saves them together in the same data record. (*Id.*, 15:60-16:4; Fig. 9B.) That device ID 922 “may be a **telephone** #, physical or logical address, or some other unique handle to the RDPS.” (*Id.*, 15:20-22, 63-64; *see also id.*, 7:39-41 (“Wireless devices (i.e. RDPS) are known by a unique identifier, for example **a caller id**, device identifier, or like appropriate unique handle.”).) A person of ordinary skill in the art would have understood that information, including at least a telephone number (or caller ID), to be identification information associated with an RDPS (e.g., a mobile device having that telephone number).



(Ex. 1008, Fig. 9B.)

97. Accordingly, Johnson discloses that for each RDPS (“**for each monitored object**”), the device ID such as a phone number or caller ID (“**identification data**”) is stored in a location history data record with the with location and direction information (“**tracking data**”) for that RDPS (“**merging and**

storing said identification data and said tracking data of each monitored object to form monitoring data”).

98. A person of ordinary skill in the art implementing Zanolvitch's systems and methods would have had good reason to consider Johnson's data structure. For instance, such a person would have recognized that merging and storing together the identification data and tracking data for a monitored object would ensure that the tracking data was associated with a known identified object. That would allow the tracking data for the object to be updated over time, which would be less reliable for objects that had a random identifier assigned. For example, if a monitored object is identified, and that identification data is merged with the tracking data for the object as Johnson discloses, such merging would readily permit the system to determine if a future (or past) monitored object was the same object by comparing the identification data. Having that common identification data merged and stored with the tracking data would allow a single record of the object's tracking information to be maintained even if the object is intermittently seen (as opposed to continuously tracked) because each time it appears and is identified, its prior tracking data could be retrieved and updated based on the static identification data.

99. A person of ordinary skill in the art also would have understood that merging the identification data and tracking data simplifies data management and

increases system efficiency. For example, such merging (as disclosed by Johnson) would likely reduce the number of database lookups required because there is no need to join separate tables (e.g., one with identification data and one with tracking data), which would have the benefits of reducing memory needs, improving query speeds, and reducing communication payloads. Combining identification data with tracking data would also allow for immediate attribution of tracking data to a known identified object without any further steps or database lookups required because that data is merged and stored together.

100. Given that Johnson discloses such merged identification data and tracking data, this would have been a predictable optimization using a known data structure. As such, Johnson provides a known solution for storing identification data and tracking data (i.e., merged into a single record), and a person of ordinary skill would have been motivated to implement that data structure in Zanovitch's system for the reasons discussed above. Such a person would have had a reasonable expectation of success because, for example, adopting a merged data structure like that disclosed by Johnson would not require a wholesale redesign of Zanovitch's system given that Zanovitch already obtains, associates, and uses identification data and tracking data for each monitored object. Such modifications would have been well within a person of ordinary skill in the art's skills and abilities because the

modifications are merely applying known data structures and storage methodologies to known systems and would have yielded predictable results. Accordingly, a person of ordinary skill would have been motivated to implement a merged data structure like Johnson discloses in Zanolitch. Zanolitch discloses or suggests the remaining limitations of claim 17 for the same or similar reasons as I discussed above. (See above at §IX.A.1.)

2. Claim 14

101. Zanolitch discloses all limitations of claim 14 as discussed above, including merging and storing the identity (“**identification data**”) and the weight (“**tracking data**”) of each item such as a carry-on bag (“**monitored object**”). (*Supra*, §IX.A.4.) Those disclosures are consistent with the ’509 patent. (*See, e.g., supra*, §§IX.A.1.iv, IX.A.4, IX.B.1.) Although Zanolitch discloses claim 14, I have been asked to consider a scenario where Zanolitch does not expressly disclose one or more of the limitations regarding merging identification data and tracking data in monitoring data groups. In that scenario, Zanolitch in view of Johnson discloses or suggests those features, and a person of ordinary skill would have been motivated, in view of Johnson, to configure Zanolitch to implement the claimed data structure. (See above at §IX.B.1.) Thus, Zanolitch in view of Johnson discloses and/or suggests claim 14 for the reasons I explain below.

102. For example, as discussed above for claim 17, a person of ordinary skill would have been motivated, in view Johnson, of to implement a data structure in Zanovitch where the identification data for each monitored object is merged with the tracking data for that monitored object, and stored in a data record together such that each object has its own data record containing its merged identification and tracking data. (See above at §IX.B.1.) Each such record would correspond to a “**monitoring data group**” (limitation 14.a), which, for the same or similar reasons as explained for claim 17 (discussed in §IX.B.1) includes “**identification data associated with a monitored object**” (limitation 14.b) and “**tracking data associated with said monitored object**” (limitation 14.c) that is “**merged data**” (limitation 14.d) stored together in the same record. Accordingly, for the same or similar reasons as I discussed for claim 17, the Zanovitch-Johnson combination discloses and/or suggests claim 14.

3. Claim 24

103. As I discussed above in Section IX.A.7, Zanovitch discloses claim 24. But to the extent Zanovitch does not explicitly disclose claim 24, Zanovitch in view of Johnson discloses and/or suggests claim 24 for the reasons I discuss above for claims 14 and 17. As I previously explained, my analysis for claims 14 and 17 applies to the limitations of claim 24. (See my analysis above in §IX.A.7

demonstrating how Zanolitch discloses claim 24 with reference to my analysis for claims 14 and 17). Accordingly, for the same or similar reason discussed in Sections IX.A.1 and IX.A.4 (Zanolitch for claims 14 and 17) and in Sections IX.B.1 and IX.B.2 (Zanolitch-Johnson for claims 14 and 17), the Zanolitch-Johnson combination discloses and/or suggests claim 24.

4. Claims 15, 16, 18, 19, 25, 26

104. Zanolitch discloses and/or suggests the limitations of claims 15, 16, 18, 19, 25, and 26 for the same or similar reasons I discussed above. (See my discussion above at §§IX.A.2-3, 5-6, 8-9.) These are dependent claims that each depend (directly or indirectly) from one of independent claims 14, 17, and 26 discussed above. The combination of Zanolitch and Johnson I discussed above for those independent claims does not change how Zanolitch discloses the limitations of these dependent claims. Accordingly, the Zanolitch-Johnson combination discloses and/or suggests claims 15, 16, 18, 19, 25, and 26.

C. Pederson Discloses Claims 14-19 and 24-26

1. Claim 17

i) [17.pre] “A method of monitoring an object, said method comprising:”

105. I understand that this limitation is a preamble of the claim, and I have been asked to assume that the preamble is limiting. Under that assumption, Pederson

discloses the preamble of claim 17. For example, Pederson discloses a system that performs a method of identifying and tracking (“**monitoring**”) a vehicle or person (“**an object**”) as discussed for the below claim limitations. For example, Pederson discloses “[a]n intelligent video/audio observation and identification database system.” (Ex. 1005, abstract; *see also e.g., id.*, 7:59-9:17.) The system can utilize cameras 12, input devices 18, computers 22 and 60 and other devices (such as shown in Pederson’s Figure 1) for monitoring vehicles and/or individuals within a security zone, as discussed for the below limitations of claim 1 (“**[a] method of monitoring an object**”). (*Id.*, 7:59-9:17.)

ii) **[17.a] “generating identification data associated with each monitored object located at an identification gateway of a monitored environment, wherein said generating identification data is performed by an identification system;”**

106. Pederson discloses this limitation. Pederson discloses at least one optical sensor (camera) 12 and/or other inputs 18 such as a fingerprint (or thumbprint) scanner 20, palm scanner, and microphone 19 at an entry gate (e.g., a first security zone), which are used to identify vehicles and individuals entering a monitored area comprising one or more security zones. (Ex. 1005, 7:65-67 (“The system 10 may also include other input devices 18, such as fingerprint scanners, palm scanners, microphones, retinal scanners, and the like.”), 14:5-18, Fig. 2

(showing entry gate with optical input devices 12 and input device 18), Fig. 7.) The output from those various identification devices is input into computer 22 as shown in, for example, figure 1. (Ex. 1005, Fig. 1; *see also e.g., id.*, 9:41-43, 9:52-55 (“the computer 22 receives data independently from one or more input devices 12, 18”), Fig. 7.)⁴

107. For example, “FIG. 2 depicts an entry point or security checkpoint 52, which may comprise a zone 50.” (Ex. 1005, 9:18-19.) At checkpoint 52, using input devices 12 and 18, the system captures identification information about the vehicle and its occupants, either of which can correspond to a “**monitored object.**” (*See* Ex. 1005, 9:19-32 (“The intelligent observation and identification database system 10 preferably utilizes an observation post or checkpoint 52 at an entrance or an exit to a secured zone 50 ...”); 9:33-36 (“As a vehicle 70 approaches the checkpoint 52,

⁴ Pederson generally labels video input devices or cameras as “12” and other input devices as “18,” but sometimes uses different numbering to indicate specific types of input devices 18, such as “microphone 19” and “fingerprint scanner 20.”

Consistent with Pederson’s nomenclature, when I refer to input devices “18,” that includes the other input devices such as “microphone 19” and “fingerprint scanner 20.”

the intelligent video/audio observation and identification database system 10 desirably employs a plurality of input devices 12, 18 to record images related to the vehicle 70 and its occupants 56.”); *see also id.*, 14:5-18, 17:8-13), FIGs. 1, 2, 7.) That captured identification information is analyzed to identify the vehicle and occupants entering a security zone 50. (*See, e.g.*, Ex. 1005, 7:13-19, 14:19-23, 14:46-59 (“system 10 may be capable of automatically identifying vehicle occupants 56 and other personnel 56 entering into the security zone 50”).) For example, “an image of the vehicle 70 license plate 54 is recorded,” which is used by “computer 22 . . . to determine the license plate 54 number.” (*Id.*, 10:40-48.)

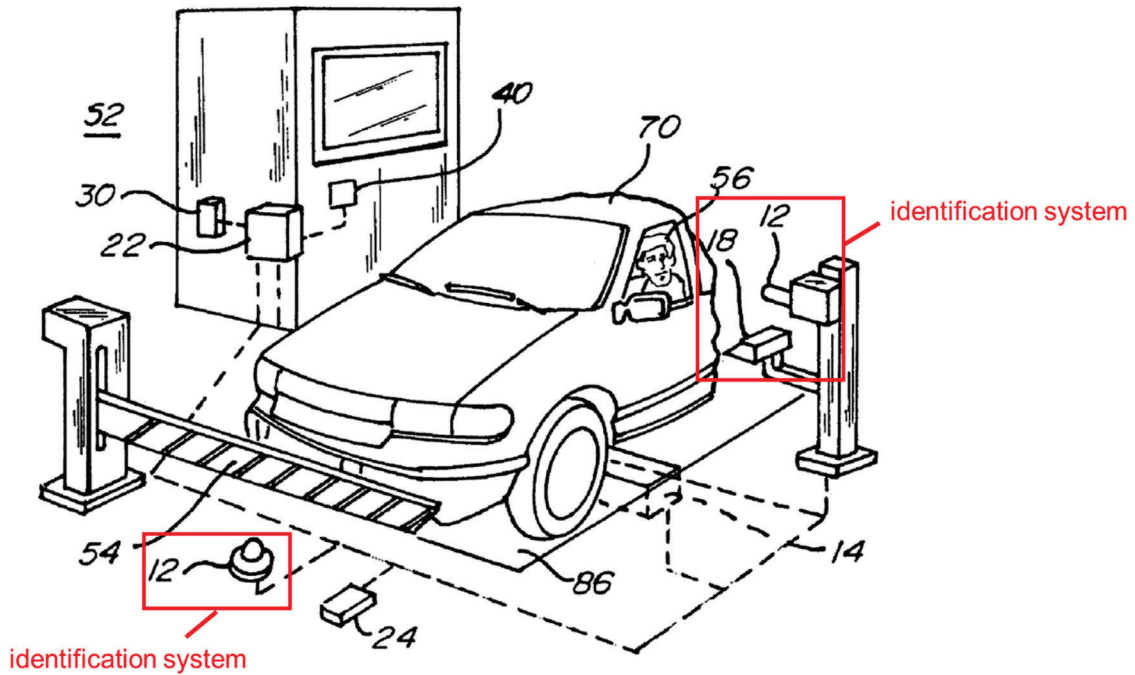


Fig.2.

(Ex. 1005, Fig. 2 (annotated).)

108. Therefore, sensors 12 and 18 alone or in combination with computer 22 constitute an “**identification system**” that “**generat[es] identification data**” (e.g., license plate number) “**associated with each monitored object**” (e.g., vehicle 70) “**located at an identification gateway of a monitored environment**” (e.g., entry gate of zone 50).

- iii) **[17.b] “generating tracking data associated with each monitored object located within said monitored environment, wherein said generating tracking data is performed by a tracking system;”**

109. Pederson discloses this claim limitation. As I explain below, Pederson discloses additional sensors such as one or more cameras 12 within a security zone 50 (“**said monitored environment**”), where those cameras are used to track the identified vehicles or persons after they have passed through the gate into the security zone (“**generating tracking data associated with each monitored object located within said monitored environment, wherein said generating tracking data is performed by a tracking system**”).

110. Pederson discloses “[t]he system may track individuals or vehicles within a zone or between zones.” (Ex. 1005, Abstract.) And further discloses that such tracking is done using cameras 12, which output their data for each monitored person or vehicle within a security zone to computer 22. (*See, e.g.*, Ex. 1005, 7:47-52 (“The tracking of vehicles within the security zone is accomplished through the use of a plurality of optical devices which may be cameras, digital cameras, and/or other types of recording devices which are either mounted in a static and/or active position for recording of a specific field adjacent to, or within, the security zone.”), 8:25-56 (describing setting up optical input devices 12 to observe a security zone 50

and connecting those devices to computer 22), 18:55-65 (“The intelligent audio/visual observation and identification database system 10 may further be arranged to track vehicles 70 or individuals 56 as they move from zone 50 to zone 50. . . . Over time, the system 10 may learn typical paths, times and zones 50 where specific vehicles 70 and individuals 56 spend their time”), 19:13-17 (tracking person 56 within zone 50 using video feeds), 19:34-39 (“A computer 22 may further track vehicles 70 or individuals 56 within the security zone 50 In addition, the computer 22 will track the subsequent repositioning of a vehicle 70 or individual 56 within a security zone 50.”).) Thus, cameras 12, alone or in combination with computer 22, within the security zone 50 disclose a “**tracking system**,” where their tracking activity (e.g., location of vehicle within zone(s) 50, path taken by vehicle in zones 50) constitutes “**tracking data**” associated with the “**monitored object**” (e.g., vehicle 70).

- iv) [17.c] “**merging and storing said identification data and said tracking data of each monitored object to form monitoring data for each monitored object; and**”

111. Pederson discloses this limitation. Pederson discloses that “[t]he computer 22 for the intelligent audio/visual observation and identification database system 10 implements the recording of data to build vehicle 70/individual 56 specific

files or histories, including images representative of activity within a security zone 50.” (Ex. 1005, 19:22-26.) Such data is stored in database 30 (database system 10 refers to the entire apparatus/system, not a storage database). (*See, e.g.*, Ex. 1005, 8:59-62 (“The computer 22 will then accumulate data and build a database 30, 62 for observed vehicles 70 and individuals 56 within the individual security Zone 50.”).) Thus, computer 22 and database 30 together create and store a vehicle-specific and/or individual-specific file history for each identified and tracked vehicle or person (where each vehicle and person corresponds to a “**monitored object**”).

112. Pederson’s vehicle 70/individual 56 specific files include both the tracking information from within a security zone (Ex. 1005, 19:22-26) and identification information obtained at the gate (*id.*, 17:8-13). Pederson discloses that information “within the database 30 pertaining to the vehicle 70 or individual 56” is stored using a classification system “such as by license plate 54.” (*Id.*, 16:35-38.) Accordingly, a person of ordinary skill in the art would have understood that the identification and tracking information for each monitored object is “**merg[ed]**” to form “**monitoring data for each monitored object.**” This is consistent with the description of merging data in the ’509 patent:

Before the identification data and the tracking data for each monitored object is merged, the monitoring system

100 interprets this data as representing tracking data for an object assigned the unique tracking identifier X and as identification data for an object identified as a person named John Smith. After the identification data and the tracking data for each monitored object is merged, the monitoring system 100 interprets this data as representing tracking data for a person named John Smith.

(Ex. 1001, 4:55-64.) In other words, Pederson merges the separate identification and tracking data for each monitored object by using a classification such as a license plate to associate the tracking data to the identified vehicle (in that example), similar to how the '509 patent merges the tracking data for a person by associating it to the identified person's name.

v) **[17.d] “comparing new content of said monitoring data of a monitored object with prior content of said monitoring data of said monitored object.”**

113. Pederson discloses this limitation. Pederson discloses that “computer 22 may... compare current vehicle 70 or individual 56 activity against previously stored and recorded activity data” (“**comparing new content of said monitoring data of a monitored object with prior content of said monitoring data of said monitored object**”). (Ex. 1005, 19:26-29; *see also id.*, 16:50-52 (“The computer 22 will next compare the observed data to the prerecorded and stored data to implement

a search for any discrepancies.”), 18:28-33 (“The currently available computer 22 hardware and software enable the intelligent audio/visual observation and identification database system 10 to identify and track vehicles 70 and/or individuals 56 within a security zone 50 and compare the observed data in real time to previously stored data to assess the risk of criminal activity.”); 21:45-22:12 (describing one way computer 22 learns prior activity patterns and compares them to current activity).

114. In one embodiment, Pederson discloses that computer 22 compares new monitoring data to prior monitoring data to look for abnormal behavior. (Ex. 1005, 19:18-33.) Such a comparison can be done by, for example, normalizing the previously recorded data obtained from monitoring individual 56 and/or vehicle 70 and comparing the current data for that individual/vehicle to the normalized data that represents their historic actions. (*Id.*, 19:18-26; *see also id.*, 19:26-33; *see also id.*, 9:46-55 (“the computer 22 receives data independently from one or more input devices 12, 18 for analysis against pre-stored and/or prerecorded data in the database 30 related to the vehicle 70 and/or individual 56”), 16:50-55.) For example, Pederson discloses that:

The computer 22 for the intelligent audio/visual observation and identification database system 10 preferably includes software to search for discrepancies

from previously normalized data representative of historic actions related to an individual 56 and/or a vehicle 70. The computer 22 for the intelligent audio/visual observation and identification database system 10 implements the recording of data to build vehicle 70/individual 56 specific files or histories, including images representative of activity within a security zone 50. *The computer 22 may therefore compare current vehicle 70 or individual 56 activity against previously stored and recorded activity data* to establish standard deviations or thresholds which may, in turn, trigger a signal or warning if current conduct is outside acceptable parameters and warrants further investigation by surveillance, security, and/or law enforcement officers.”

(Ex. 1005, 19:18-33 (emphasis added).)

2. Claim 18: “The method as recited in claim 17 further comprising: processing said monitoring data.”

115. Pederson discloses this claim because, as I discussed above, computer 22 processes the monitoring data. (See my discussion above in §IX.C.1.v.)

3. Claim 19: “The method as recited in claim 18 wherein said processing further includes: generating a message based on a result of said comparison of said new and said prior content.”

116. Pederson discloses this claim. For example, Pederson discloses generating a signal or warning (e.g., “**a message**”) based on a result of comparing new content of the monitoring data for a particular vehicle or individual with prior monitoring data for that same vehicle or individual (“**based on a result of said comparison of said new and said prior content**”). (Ex. 1005, 16:50-55 (“If any threshold discrepancy is identified, *a signal will be communicated* to a security, surveillance, or law enforcement officer to initiate a more detailed investigation.”), 19:18-33 (“The computer 22 may therefore compare current vehicle 70 or individual 56 activity against previously stored and recorded activity data to establish standard deviations or thresholds which may, in turn, *trigger a signal or warning* if current conduct is outside acceptable parameters and warrants further investigation by surveillance, security, and/or law enforcement officers.”); *see also id.*, 20:5-15 (“computer 22 automatically initiates comparisons to search for discrepancies between observed and stored data as related to a variety of thresholds to *issue a warning signal* upon automatic detections of discrepancies”).) The comparison of new and prior content is described in detail above for claim limitation 17.d. (See

my discussion above in §IX.C.1.v.) A person of ordinary skill in the art would have understood that such a warning or signal could have been communicated using monitor 40. (*see, e.g.*, Ex. 1005, 7:63-64 (“output device 40, such as a monitor”), 16:56-62 (“if the computer 22 discovers any alerting information resulting from the database 30 search... the system may issue an alert to security personnel... upon a monitor 40”), Fig. 1.)

4. Claim 14

i) **[14.pre] “A computer-readable medium having stored therein a data structure comprising:”**

117. I understand that this limitation is a preamble of the claim, and I have been asked to assume that the preamble is limiting. Under that assumption, Pederson discloses the preamble of claim 14. For example, Pederson discloses that “[s]oftware is preferably loaded onto computer 22” to execute the system’s various functions (Ex. 1005, 8:34-48), including “processing capability from static optical devices 12 such as cameras, where the software may be used to track a person 56 or vehicle 70 within a zone 50” (*id.*, 18:34-39; *see also id.*, 25:26-35) and when entering or exiting a zone (*id.*, 16:16-29), and “to search for discrepancies from previously normalized data representative of historic actions related to an individual 56 and/or a vehicle 70” (*id.*, 19:18-33; *see also id.*, 21:45-22:12, 25:36-26:12). Pederson also

discloses “a database 30, which may be an evolving database, which may be located inside the computer 22” (*id.*, 7:61-64), that is “updated according to data saved by the system (8:13-15) such as data accumulated from input devices 12 and 18 and used “to build a database 30 ... for observed vehicles 70 and individuals 56” (8:56-62; *see also* 7:24-30, 9:19-26, 9:46-10:4, 16:19-21 (“Each time an individual 56 or vehicle 70 enters or exits a security zone 50, the system 10 may record in the database 30 the time and location of the arrival or exit.”). Such data pertaining to each vehicle 70 and individual 56 is stored in database 30 “based any desired classification system, such as by license plate 54, and other retrieved identification information.” (Ex. 1005, 16:30-38.) A person of ordinary skill in the art would have understood that such software and data stored in database 30 comprises “**a data structure**” stored on “**a computer-readable medium**” (e.g., a hard drive or other memory).

ii) [14.a] “**A plurality of monitoring data groups, each monitoring data group associated with one of a plurality of monitored objects, wherein each monitoring data group includes:**”

118. Pederson discloses this limitation. For example, Pederson discloses collecting data within database 30 corresponding to various vehicles and persons (“**a plurality of monitored objects**”) at a gate or checkpoint and within security zones

as discussed above. (See my discussion above in §§IX.C.1.ii-iv.) That data is saved and categorized using a classification system such as “by license plate” (Ex. 1005, 16:30-38), where a person of ordinary skill in the art would have understood that, for example, each individual license plate corresponds to a particular vehicle and so Pederson discloses the data for each monitored person or vehicle is grouped or associated by such person/vehicle-specific identification information (“**each monitoring data group associated with one of a plurality of monitored objects**”). (Also see my discussion above in §§IX.C.1.ii-iv.) Pederson discloses this claim limitation for the same or similar reasons as those I previously discussed. (*Id.*)

iii) [14.b] “**identification data associated with a monitored object, wherein said identification data is generated when said monitored object is located at an identification gateway of a monitored environment;**”

119. Pederson discloses this limitation for reasons similar to those I discussed above in Section IX.C.1.ii. For instance, Pederson discloses generating identification data for a person or vehicle at a gate or security checkpoint such as that depicted in Figure 2 (“**an identification gateway of a monitored environment**”), which is saved in database 30. (See my discussion above in §§IX.C.1.ii.) Pederson discloses this claim limitation for the same or similar reasons. (*Id.*)

- iv) **[14.c] “tracking data associated with said monitored object, wherein said tracking data is generated when said monitored object is located within said monitored environment; and”**

120. Pederson discloses this limitation for reasons similar to those I discussed above in Section IX.C.1.iii. For instance, Pederson discloses generating tracking data for a person or vehicle (“**associated with said monitored object**”) within a security zone 50 after they enter through a gate or security checkpoint (“**tracking data is generated when said monitored object is located within said monitored environment**”), which is saved in database 30. (See my discussion above in §IX.C.1.iii.)

- v) **[14.d] “merged data that is based on the comparison of new content of monitoring data of a monitored object and prior content of said monitoring data of said monitored object.”**

121. Pederson discloses this limitation for reasons similar to those I discussed above in Section IX.C.1.iv-v. For instance, Pederson discloses “merging” and “comparing” new content of the monitoring data for a given monitored object (e.g., person or vehicle) with prior content of the monitoring data for the same object (e.g., “**merged data that is based on the comparison**”). (See my discussion above in §IX.C.1.iv-v.) In addition, Pederson discloses that the system 10 can learn and recognize repetitive patterns. (*See, e.g.*, Ex. 1005, 21:45-22:13.) As part of that

process, “computer 22 for the intelligent audio/visual observation and identification database system 10 may be arranged to continuously compare each observed encounter to the collection of previously stored data to identify patterns and deviations from the patterns as previously recorded.” (*Id.*, 21:45-49.) In response to new data, “computer 22 will generally continue to store data, and therefore update the pattern, as detected by the input devices 12, 18. The computer 22 is preferably designed to recalculate a mean for the data following each additional data entry.” (*Id.*, 21:64-22:1.) A person of ordinary skill in the art would also understand that the updated pattern is **merged data that is based on the comparison** at least because it is generated through comparing observed encounters (**new content monitoring data**) with the previously stored encounter data (**prior content of said monitoring data**).

5. **Claim 15: “The computer-readable medium as recited in claim 14 wherein said identification data is generated by an identification system.”**

122. Pederson discloses claim 15 for the same or similar reasons as I discussed for claim limitation 17.a. (See my discussion above in §§IX.C.1.ii.)

6. Claim 16: “The computer-readable medium as recited in claim 14 wherein said tracking data is generated by a tracking system.”

123. Pederson discloses claim 16 for the same or similar reasons as I discussed for claim limitation 17.b. (See my discussion above in §§IX.C.1.iii.)

7. Claim 24

i) [24.pre] “A computer-readable medium comprising computer-executable instructions stored therein for performing a method of monitoring an object, said method comprising:”

124. I understand that this limitation is a preamble of the claim, and I have been asked to assume that the preamble is limiting. Under that assumption, Pederson discloses the preamble of claim 24 for the same or similar reasons as I discussed for claim elements 14.pre and 17.pre. (See my discussion above in §§IX.C.1.i, IX.C.4.i.)

ii) [24.a] “generating identification data associated with each monitored object located at an identification gateway of a monitored environment, wherein said generating identification data is performed by an identification system;”

125. Pederson discloses this limitation for the same or similar reasons as I discussed for claim limitation 17.a. (See my discussion above in §IX.C.1.ii.)

- iii) **[24.b] “generating tracking data associated with each monitored object located within said monitored environment, wherein said generating tracking data is performed by a tracking system;”**

126. Pederson discloses this limitation for the same or similar reasons as I discussed for claim limitation 17.b. (See my discussion above in §IX.C.1.iii.)

- iv) **[24.c] “merging and storing said identification data and said tracking data of each monitored object to form monitoring data for each monitored object; and”**

127. Pederson discloses this limitation for the same or similar reasons as I discussed for claim limitation 17.c. (See my discussion above in §IX.C.1.iv.)

- v) **[24.d] “comparing new content of said monitoring data of a monitored object with prior content of said monitoring data of said monitored object.”**

128. Pederson discloses this limitation for the same or similar reasons as I discussed for claim limitation 17.d. (See my discussion above in §IX.C.1.v.)

- 8. **Claim 25: “The computer-readable medium as recited in claim 24 wherein said method further comprises: processing said monitoring data.”**

129. Pederson discloses this limitation for the same or similar reasons as I discussed for claim 18. (See my discussion above in §IX.C.2.)

9. Claim 26: “The computer-readable medium as recited in claim 25 wherein said processing further includes: generating a message based on a result of said comparison of said new and said prior content.”

130. Pederson discloses this limitation for the same or similar reasons as I discussed for claim 19. (See my discussion above in §IX.C.3.)

D. Pederson in View of Johnson Discloses and/or Suggests Claims 14-19 and 24-26

1. Claim 17

131. Pederson discloses all limitations of claim 17 as I discussed above, including merging and storing the identification data and tracking data for each vehicle 70 and individual 56 and storing those within vehicle/individual specific files. (See above at §IX.C.1.iv.) Pederson’s disclosure is consistent with the ’509 patent, which explains that “merging” is simply assigning or linking the identification data to the tracking data as opposed to using a tracking identifier that is unrelated to the monitored object’s identity. (*See id.*; Ex. 1001, 4:52-64.) Although Pederson discloses claim 17, I have been asked to consider a scenario where that Pederson does not expressly disclose **“merging and storing said identification data and said tracking data of each monitored object to form monitoring data for each monitored object”** (limitation 17.c). In that scenario Pederson in view of Johnson discloses or suggests that feature, and a person of

ordinary skill would have been motivated in view of Johnson to configure Pederson to form monitoring data for each monitored object as claimed.

132. Johnson relates to monitoring identification and location information I discussed above in Section IX.B.1 and is therefore in the same or a similar field to Pederson and the '509 Patent. I describe Johnson's disclosures in detail above. (See above at §IX.B.1.)

133. A person of ordinary skill in the art implementing Pederson's systems and methods would have had good reason to consider Johnson's data structure. For instance, such a person would have recognized that merging and storing together the identification data and tracking data for a monitored object would ensure that the tracking data was associated with a known identified object. That would allow the tracking data for the object to be updated over time, which would be less reliable for objects that had a random identifier assigned. For example, if a monitored object is identified, and that identification data is merged with the tracking data for the object as Johnson discloses, such merging would readily permit the system to determine if a future (or past) monitored object was the same object by comparing the identification data. Having that common identification data merged and stored with the tracking data would allow a single record of the object's tracking information to be maintained even if the object is intermittently seen (as opposed to continuously

tracked) because each time it appears and is identified its prior tracking data could be retrieved and updated based on the static identification data.

134. A person of ordinary skill in the art also would have understood that merging the identification data and tracking data simplifies data management and increases system efficiency. For example, such merging (as disclosed by Johnson) would likely reduce the number of database lookups required because there is no need to join separate tables (e.g., one with identification data and one with tracking data), which would have the benefits of reducing memory needs, improving query speeds, and reducing communication payloads. Combining identification data with tracking data would also allow for immediate attribution of tracking data to a known identified object without any further steps or database lookups required because that data is merged and stored together.

135. Given that Johnson discloses such merged identification data and tracking data, this would have been a predictable optimization using a known data structure. As such, Johnson provides a known solution for storing identification data and tracking data (i.e., merged into a single record), and a person of ordinary skill would have been motivated to implement that data structure in Pederson's system for the reasons discussed above. A person of ordinary skill would have had a reasonable expectation of success because, for example, adopting a merged data

structure like that disclosed by Johnson would not require a wholesale redesign of Pederson's system given that Pederson already obtains, associates, and uses identification data and tracking data for each monitored object, including creating vehicle 70/individual 56 specific files. (See above at §IX.C.1.iv.) Such modifications would have been well within a person of ordinary skill in the art's skills and abilities because they are merely applying known data structures and storage methodologies to known systems and would have yielded predictable results. Accordingly, a person of ordinary skill would have been motivated to implement a merged data structure like Johnson discloses in Pederson. Pederson discloses or suggests the remaining limitations of claim 17 for the same or similar reasons as I discussed above. (See my discussion above at §IX.C.1.)

2. Claim 14

136. Pederson discloses all limitations of claim 14 as I discussed above, including merging and storing person/vehicle-specific identification information ("**identification data**") and the tracking data for persons/vehicles within a security zone 50 after they enter through a gate or checkpoint ("**tracking data**") for each such person/vehicle ("**monitored object**"). (See my discussion above in §IX.C.4.) Those disclosures are consistent with the '509 patent. (See, for example, my discussion in §§IX.C.1.iv, IX.C.4, IX.D.1.) Although Pederson discloses claim 14,

I have been asked to consider a scenario where Pederson does not expressly disclose one or more of the limitations regarding merging identification data and tracking data in monitoring data groups. In that scenario, Pederson in view of Johnson discloses or suggests those features, and a person of ordinary skill would have been motivated in view of Johnson to configure Pederson to implement the claimed data structure. (See above at §IX.D.1.) Thus, Pederson in view of Johnson discloses and/or suggests claim 14 for the reasons as I discuss in this section.

137. For example, as discussed above for claim 17, a person of ordinary skill would have been motivated in view Johnson of to implement a data structure in Pederson where the identification data for each monitored object is merged with the tracking data for that monitored object, and stored in a data record together such that each object has its own data record containing its merged identification and tracking data. (See above at §IX.D.1.) Each such record would correspond to a “**monitoring data group**” (limitation 14.a), which, for the same or similar reasons as explained for claim 17 (discussed above at §IX.D.1) includes “**identification data associated with a monitored object**” (limitation 14.b) and “**tracking data associated with said monitored object**” (limitation 14.c) that is “**merged data**” (limitation 14.d) stored together in the same record. (Also see my discussion above of how Pederson discloses claim 14 in §IX.D.4.) Accordingly, for the same or similar reasons as

discussed for claim 17, the Pederson-Johnson combination discloses and/or suggests claim 14. (See my discussions above at §§IX.D.1 and IX.D.4.)

3. Claim 24

138. As I discussed above, Pederson discloses claim 24. (Above at §IX.C.7.) But to the extent Pederson does not explicitly disclose claim 24, Pederson in view of Johnson discloses and/or suggests claim 24. As I discussed in Section IX.C.7, my analysis for claims 14 and 17 applies to the limitations of claim 24. (Above at §IX.C.7 (demonstrating how Pederson discloses claim 24 with reference to my analysis for claims 14 and 17).) Accordingly, for the same or similar reasons as I discussed there and for claims 14 and 17 with respect to the Pederson-Johnson combination, the Pederson-Johnson combination discloses and/or suggests claim 24. (See my discussions above at §§IX.C.7, IX.D.1-2.)

4. Claims 15, 16, 18, 19, 25, 26

139. Pederson discloses and/or suggests the limitations of claims 15, 16, 18, 19, 25, and 26 for the same or similar reasons as I discussed above. (See above at §§IX.C.2-3, 5-6, 8-9.) These are dependent claims that each depend (directly or indirectly) from one of independent claims 14, 17, and 26 discussed above. The combination of Pederson and Johnson discussed above for those independent claims does not change how Pederson discloses the limitations of these dependent claims.

Accordingly, the Pederson-Johnson combination discloses and/or suggests claims 15, 16, 18, 19, 25, and 26.

E. Pederson in View of Maruya Discloses and/or Suggests Claims 20, 21, 27, and 28

- 1. Claim 20: “The method as recited in claim 18 wherein if said tracking system loses track of a first monitored object within said monitored environment, said processing includes: determining whether a second monitored object represents said first monitored object lost by said tracking system.”**

140. Pederson and Maruya disclose or suggest claim 20. Pederson discloses tracking a person or vehicle within one or more zones 50 using a plurality of cameras 12. (See my discussion above in §IX.C.1.) But as a tracked person or vehicle moves within or between zones 50, Pederson does not expressly disclose how or if cameras 12 can resume tracking of a monitored person or vehicle if the system loses track of that object. (*See generally* Ex. 1005.)

141. Maruya discloses a surveillance system comprising a plurality of cameras configured to track a target object in a space having blind spots. (Ex. 1007, 2:41-46.) For example, Maruya’s surveillance system extracts information about the features of a tracked object or person (a “target”) that are used to identify the target and stores them in information comparing means 13. (*Id.*, 3:59-4:39; *see also id.*, 7:19-28.) Then that system compares the images from a camera to the extracted

features (using comparing means 13) to determine if the target is present within the camera view. (*Id.*, 5:14-6:13.) When the target is not detected on the tracking camera, it assumes the target has disappeared from view. (*Id.*, 6:29-34; *see also id.*, 7:29-59.) In response to the target disappearing from view, Maruya transmits the feature information to other cameras (i.e., by identifying the target), and when any camera detects the target by matching it to the stored features, thereby determining the newly acquired target is the same one previously identified, that camera starts transmitting video of the target. (*Id.*, 6:35-67; *see also id.*, 7:60-8:3.) In this way, if Maruya's surveillance system loses track of the target ("**monitored object**"), the system including its comparing means 13 is capable of determining whether a moving object on a second camera ("**a second monitored object**") is the same object as the target ("**said processing includes: determining whether a second monitored object represents said first monitored object lost by said tracking system**") by identifying that same monitored object on another camera (or the original camera once it is re-acquired) within the monitored environment and then comparing the feature information for the identified target.

142. A person of ordinary skill in the art considering Pederson's disclosures would have understood that in real world applications, cameras 12 in Pederson's zones 50 would not always be able to provide complete coverage throughout a

monitored environment. For example, a tracked person or object could pass through a blind spot between cameras, or behind another person or object where they are not visible to any camera. (*See* Ex. 1007, 1:48-58 (“Even when a plurality of cameras are used... information about position and motion of the movable object is lost when a blind spot is present, thus preventing further tracking.”).) In such circumstances, it would have been desirable to resume tracking the person or vehicle after they became visible to or recognized by one of the cameras again. Otherwise, if Pederson’s system could not resume tracking for a person or vehicle if it was even momentarily lost, Pederson’s system would be unreliable and easy for malicious actors to avoid or subvert, undermining its value as a security tool. Accordingly, a person of ordinary skill in the art would have looked to Maruya, which is in the same or a similar field to Pederson and the ’509 patent, as all relate to security and tracking systems. Having looked to Maruya, such a person would have been motivated to implement functionality in Pederson’s apparatus so that if one of its tracking system cameras loses track of the person or vehicle being monitored within a zone 50, then Pederson’s computer 22 would be configured to enable the apparatus to determine whether a person or object appearing on the feed from a different camera was the same as the first person or object previously tracked and lost by the first camera as taught by Maruya.

143. Pederson's computer 22 already processes and analyzes monitoring data, including comparing new monitoring data to old monitoring data. (See, for example, my discussion above in §IX.C.1.v.) Thus, a person of ordinary skill in the art would have understood that computer 22 could have been used to implement the functionality taught by Maruya and discussed above in Pederson's system. Computer 22 already handles all information processing in Pederson's system, so a person of ordinary skill in the art would have implemented any new functionality on that same computer. The combination would have yielded the known improvement of enabling the system to resume tracking of an object that was previously lost. A person of ordinary skill in the art would have had a reasonable expectation of success at least because the combination is simply the result of implementing a known function in a known system using generic known hardware (a computer and cameras as disclosed by Pederson and Maruya).

2. **Claim 21: "The method as recited in claim 20 wherein said determining is performed in response to said identification system identifying said first monitored object after said tracking system lost track of said first monitored object, and wherein said processing further includes modifying said monitoring data based on said determining step."**

144. Pederson and Maruya disclose or suggest claim 21. As explained above for claim 20, the Pederson-Maruya system identifies an object, and then determines

if that object matches the stored features for the monitored or tracked object. (See my discussion above in §IX.E.1; *see also, e.g.*, Ex. 1007, 3:59-65.) Thus, it identifies the new object as being the same object as the previously monitored object using the object-specific features. (*See id.*) Pederson discloses that entry point or security checkpoint 52 can identify vehicles and individuals as they both enter and exit a secured zone 50. (Ex. 1005, 9:18-32.) Thus, when a camera within a zone 50 loses track of a monitored individual or vehicle, that person or vehicle that had previously entered a zone 50 would at least be identified as they left zone 50 using the same **“identification system”** discussed above. (See my discussion above in §IX.C.1.ii.) Thus, the context of the Pederson-Maruya method discussed for claim 20, Pederson’s **“identification system”** camera 12 at checkpoint 52 is one camera that could perform the identification of a lost object (e.g., as it attempts to exit the monitored area) (**“said identification system identifying said first monitored object after said tracking system lost track of said first monitored object”**). And a person of ordinary skill in the art would have understood that Pederson’s computer 22 modifies the monitoring data based on that identification, at least because Pederson discloses that such identification information from “input devices 12, 18 ... [is] stored by the intelligent video/audio observation and identification database

system 10.” (Ex. 1005, 9:26-32; *see also* above at §IX.C.1.ii (computer 22 receiving identification data from identification system).)

3. **Claim 27: “The computer-readable medium as recited in claim 25 wherein if said tracking system loses track of a first monitored object within said monitored environment, said processing includes: determining whether a second monitored object represents said first monitored object lost by said tracking system.”**

145. Pederson and Maruya disclose or suggest claim 27 for the same or similar reasons as I discussed above for claim 20. (See my discussion above in §IX.E.1.)

4. **Claim 28: “The computer-readable medium as recited in claim 27 wherein said determining is performed in response to said identification system identifying said first monitored object after said tracking system lost track of said first monitored object, and wherein said processing further includes modifying said monitoring data based on said determining step.”**

146. Pederson and Maruya disclose or suggest claim 10 for the same or similar reasons as I discussed above for claim 21. (See my discussion above in §IX.E.2.)

F. Pederson in view of Maruya, and Johnson Discloses and/or Suggests Claims 20, 21, 27, and 28

147. As I discussed above in Section IX.E, Pederson and Maruya discloses and/or suggests claims 20, 21, 27, and 28. Those claims indirectly depend on either claim 17 or claim 24. For the reasons I discussed above in Section IX.D, to the extent Pederson does not disclose one or more limitations of independent claims 17 or 24, Pederson in view of Johnson discloses and/or suggests those independent claims. (See above at §§IX.D.2-3.) A person of ordinary skill in the art would have combined Johnson with the Pederson-Maruya combination for the same or similar reasons as I discussed above. (*Id.*) The addition of Maruya to the combination does not change my analysis because Maruya relates to identifying and tracking objects that are occasionally occluded from the view of one or more cameras, which is not pertinent to the format of the data structure disclosed by Johnson and that a person of ordinary skill would have been motivated to implement in Pederson in view of Johnson. Therefore, the Pederson-Maruya-Johnson combination discloses and/or suggests these claims for reasons similar to those I discussed in Section IX.E.

X. CONCLUSION

148. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: February 16, 2026

By: 

David Hilliard Williams