

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ORACLE CORPORATION,
Petitioner

v.

PARKING WORLD WIDE LLC,
Patent Owner

Case No.: IPR2023-00385
U.S. Patent No. 10,438,421
Original Issue Date: October 8, 2019

Title: PARKING STATUS SYSTEM

**DECLARATION OF JOSEPH PARADISO, PH.D., IN SUPPORT OF
PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 10,438,421**

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Declaration of Joseph Paradiso, Ph.D.,
In Support of *Inter Partes* Review of U.S. Patent No. 10,438,421

I, Joseph Paradiso, Ph.D., hereby declare as follows:

I. INTRODUCTION

1. I have been retained on behalf of Oracle Corporation (“Oracle” or “Petitioner”) as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“USPTO”). I am not an employee of Oracle or any affiliate or subsidiary of Oracle.

2. I have been asked to consider whether certain references teach or suggest the features recited in the claims of U.S. Patent No. 10,438,421 to Bashani, which I refer to herein as the 421 Patent, and whether those references render those claims obvious.

3. My opinions and the bases for my opinions are set forth below.

4. I am being compensated at my ordinary and customary rate of \$700 per hour for my work, plus reimbursement for any reasonable expenses. My compensation is based solely on the amount of time that I devote to activity related to this case and is in no way contingent on the nature of my findings or opinions, the presentation of my findings or opinions in testimony, or the outcome of this or any other proceeding. I have no other financial interest in this proceeding.

II. EDUCATIONAL BACKGROUND, PROFESSIONAL EXPERIENCE, AND OTHER QUALIFICATIONS

5. I have devoted my career to various fields of physical, electrical, and computer science with more than two decades focused on embedded sensing, including wired and wireless sensors and the ways that users experience and interact with sensor and system information.

6. I am the Alexander W. Dreyfoos Professor in Media Arts and Sciences at the Massachusetts Institute of Technology (MIT), where I direct the Responsive Environments Group, which explores how sensor networks augment and mediate human experience, interaction, and perception. I am now serving as our Associate Department Head. I have also served as a codirector of the Things That Think Consortium, a group of MIT Media Lab researchers and industrial partners focused on the future of embedded computation and sensing

7. I received my B.S. in electrical engineering and physics summa cum laude from Tufts University in 1977 and my Ph.D. in physics from MIT in 1981. From 1981 to 1984, I did post-doctoral research at the Swiss Federal Institute of Technology (ETH) in Zurich, working on sensor technology for high-energy particle physics. From 1984 to 1994, I was a physicist at the Draper Laboratory in Cambridge, Massachusetts, where, as a member of the NASA Systems and Advanced Sensors

and Signal Processing Directorates, my research included spacecraft control systems and sensor technology for both sonar systems and high-energy physics.

8. I joined the MIT Media Lab in 1994. The MIT Media Lab was founded in 1985 to actively promote a unique, multi-disciplinary culture that focuses on research projects joining different technological and academic fields. Researchers at the MIT Media Lab have pioneered areas such as wearable computing, tangible interfaces, interactive navigation systems, and affective computing, along with early development of standards and technologies used in digital television. Examples of products or platforms spun off from the Media Lab research include electronic ink readers, such as the Amazon Kindle and Barnes & Noble Nook, the popular video game Guitar Hero, MPEG-4 structured audio format, the first bionic lower-leg system for amputees, wireless mesh networks developed by Nortel, 3D printers manufactured by FormLabs, wearable motion trackers for physical therapy by Figur8, stress and health monitoring systems by Affectiva and Empathica, and the Mercury RFID Reader, commercialized by spin-off ThingMagic.

9. A complete listing of my qualifications and professional experience relevant to this Expert Report can be found in my *Curriculum Vitae*, which is attached as Ex. 1004.

10. I am recognized as a pioneer in the Internet of Things, having worked in this area since the late 1990s. Leading to approximately 400 publications, 25

issued patents, and a string of awards in the Pervasive Computing, Wearable Computing, Human Computer Interaction, and sensor network communities, my research has become the basis for widely established curricula. Many of these publications are directed to fixed, wearable, or portable sensor devices, often in smart buildings and outdoor applications. I have also advised over 55 graduate (M.S. and Ph.D.) theses for students who have done their work in my research group, and served as a reader for roughly 100 M.S. and Ph.D. students in other groups and at other universities.

11. I have given nearly 400 invited talks, panel appearances, and seminars worldwide, recently keynoting on topics relating to ubiquitous sensing, smart buildings, virtual/augmented reality, wearable computing, and the Internet of Things (IoT) for prestigious venues ranging from the Sensors Expo (the main industrial sensors conference) to the World Economic Forum. I am frequently asked to address industrial and academic groups in these areas. For example, I recently gave the opening keynote at IoT Solutions World Congress in Barcelona, the leading Industrial IoT event, and presented invited colloquia at the Electrical Engineering and Computer Science Departments at UC Berkeley, Imperial College (London), Johannes Kepler University (Linz Austria), University of Bologna (Italy), and the University of Texas at Austin. I am also asked to often speak on aspects of virtual, augmented, and X-Reality—My CV includes a lengthy list, and recent examples

include the ‘Behind and Beyond the Metaverse’ panel at the IEEE Metaverse Congress (Dec. 2022), the invited opening keynote at the Wearable Technologies Conference in San Francisco (July 2022), an invited keynote at ICLR (April 2022), and the opening keynote for the large MIT Reality Hackathon this year (Jan. 2023) and in its inaugural year (Jan. 2020). I have been on the Editorial Board (and have served as Associate Editor in Chief) of IEEE Pervasive Computing Magazine (the original flagship publication in this area) since 2006. I often engage with the Media Lab’s extensive list of industrial partners in strategizing in these areas.

12. My experience in designing and deploying wireless sensor systems dates to at least 1997, when I started developing early wireless multi-sensor wearable platforms that presaged much of how the field developed. Over the next few years, I also pushed my research team to develop compact, low-power wireless sensor packages for other application niches, including smart roadbeds. Under this emphasis, we made and fielded a wireless sensor in 1999 for embedding in a road to detect, count, and measure cars passing as well as infer road conditions (*See* <https://resenv.media.mit.edu/vehicles.html>). This is described in our issued US Patent 6,662,099, which has been licensed and incorporated, I believe, into devices that include vehicle occupancy monitoring systems for parking applications.

13. Also dating from before the time of the 421 Patent, I have also run projects in my team that heavily leverage virtual and augmented reality systems

integrated with distributed networked sensors. Our early work animated real-time sensor data onto maps displayed on handheld wireless computing platforms – these would change the map with user position and orientation and show sensor status through various indicators and animations. These include our ‘Tricorder’ system from 2006 (<https://resenv.media.mit.edu/#Projects#tricorder>) and ‘Ubicorder’ system from 2007 (<https://resenv.media.mit.edu/#Projects#ubicorder>). The fusion of real-time sensing and virtual/augmented reality systems has long been and continues to be one of the foci of my research. Some representative projects in this area include our ‘Dual Reality’ (<https://resenv.media.mit.edu/#Projects#dual-reality-lab>) and ‘Cross Reality’ (<https://resenv.media.mit.edu/#Projects#ubiquitous-sensor-portals>) frameworks from 2008, our DoppelLab platform from 2010 (<https://resenv.media.mit.edu/#Projects#ubiquitous-sensor-portals>), and our DoppelMarsh projects from 2013 (<https://tidmarsh.media.mit.edu/>).

III. ASSIGNMENT AND MATERIALS CONSIDERED IN FORMING MY OPINIONS

14. I have been asked to provide analysis and explain the subject matter of the 421 Patent, including the state of the art when the 421 Patent application was filed. I have also been asked to consider, analyze, and explain certain prior art to the 421 Patent, including how that art relates to the challenged claims of the 421

Patent and to provide my opinions regarding whether that art renders the claimed subject matter unpatentable as obvious.

15. The opinions expressed in this declaration are not exhaustive of opinions I may offer in the future regarding the unpatentability of the claims of the 421 Patent. Therefore, the fact that I do not address a particular point should not be understood to indicate an agreement on my part that any claim of the 421 Patent complies with the requirements of any applicable patent or other rule.

16. I reserve the right to amend and supplement this declaration in light of additional evidence, arguments, or testimony presented during this IPR or related proceedings on the 421 Patent.

17. In forming the opinions set forth in this declaration, I have considered and relied upon my education, knowledge of the relevant field, knowledge of scientific and engineering principles, and my experience. I have also reviewed and considered the 421 Patent (Ex. 1001), its prosecution history (Ex. 1002), and the following additional materials:

Exhibit	Description
1005	U.S. Patent Appl. No. 2006/0059037 (“Ivey”)
1006	Japanese Patent Publication No. JP2008-217835 (“Matsumoto”)

Declaration of Joseph Paradiso, Ph.D.,
In Support of *Inter Partes* Review of U.S. Patent No. 10,438,421

Exhibit	Description
1007	Certified English language translation of Japanese Patent Publication No. JP2008-217835 (“Matsumoto”) and associated translator’s declaration
1008	U.S. Patent Application Publication No. 2001/0114675 (“Ward”)
1009	U.S. Patent No. 7,123,166 (“Haynes”)
1010	U.S. Patent Application Publication No. 2006/0170566 (“Slemmer”)
1011	U.S. Patent Publication No. 2006/0250278 (“Tillotson”)
1020	United Nations Convention on Road Signs and Signals, Chapter XI. Transport and Communications B. Road Traffic, Vienna, November 8, 1968
1021	M.Y.I. Idris et al., <i>Smart Parking System using Image Processing Techniques in Wireless Sensor Network Environment</i> , Information Technology Journal, Vol. 8, pp. 114-127 (2009)
1022	S. Feiner et al., <i>A Touring Machine: Prototyping 3D Mobile Augmented Reality Systems for Exploring the Urban Environment</i> , Digest of Papers. First International Symposium on Wearable Computers, Cambridge, MA, USA, pp. 74-81 (1997)
1023	U.S. Patent Application Publication No. 2002/0044152 (“Abbott”)
1024	G. Maubon, <i>A little bit of history from 2006: Nokia MARA project</i> , available at https://www.augmented-reality.fr/2009/03/un-petit-peu-dhistoire-de-2006-projet-mara-de-nokia/

IV. UNDERSTANDING OF GOVERNING LAW

18. I am not an attorney, but have been instructed in and applied the law as described in this section.

A. Claim Construction

19. I understand that the first step in determining whether a patent claim would have been anticipated or obvious is to ascertain how a POSITA would have understood the claim terms.

20. I have been instructed by counsel on the law regarding claim construction and patent claims, and I understand that a patent may include two types of claims: independent claims and dependent claims. An independent claim stands alone and includes only the limitations it recites. A dependent claim can depend from an independent claim, or it can further depend from another dependent claim. I understand that a dependent claim includes all the limitations that it recites, in addition to all the limitations recited in the claim(s) from which it depends.

21. It is my understanding that in proceedings before the USPTO, the claims of a patent are to be construed under what is referred to as the “Phillips standard.” I understand that this means that claim terms of a patent are given the ordinary and customary meaning they would have to a person of ordinary skill in the art (“POSITA”) in view of the description provided in the patent itself and the patent’s file history.

22. I understand that to determine how a person of ordinary skill would understand a claim term, one should look to those sources available that show what a person of skill in the art would have understood the disputed claim language to mean. I understand that, in construing a claim term, one looks primarily to the intrinsic patent evidence, including the words of the claims themselves, the remainder of the patent, and the patent's prosecution history. I understand that extrinsic evidence, which is evidence external to the patent and the prosecution history, may also be useful in interpreting patent claims when the intrinsic evidence itself is insufficient.

23. I understand that words or terms should be given their ordinary and accepted meaning unless it clearly appears that the inventors were using them to mean something else. In making this determination, the claims, the remainder of the patent, and the prosecution history are of paramount importance. Additionally, the patent and its prosecution history must be consulted to confirm whether the patentee has acted as its own lexicographer (*i.e.*, provided its own special meaning to any disputed terms) or intentionally disclaimed, disavowed, or surrendered any claim scope.

24. I further understand that in proceedings before the PTAB, claim terms need only be construed to the extent necessary to resolve any controversy that may arise.

25. In comparing the claims of the Challenged Patent to the prior art, I have considered the 421 Patent and its file history in light of the understanding of a POSITA at the time of the alleged invention. I address further how a POSITA would have understood the claims of the alleged invention in Sections XII-XV below.

B. Obviousness

26. I have been further instructed and understand that a patent claim is unpatentable and invalid as obvious if the subject matter of the claim as a whole would have been obvious under 35 U.S.C. § 103(a) to a person of ordinary skill in the art of the claimed subject matter as of the time of the invention at issue. I understand that when assessing the obviousness of claimed subject matter, the following factors are evaluated: (1) the scope and content of the prior art; (2) the difference or differences between each claim of the patent and the prior art; and (3) the level of ordinary skill in the art at the time the patent was filed. I also understand that the Board considers certain objective factors if they are present, generally referred to as “secondary considerations” or “objective indicia” of nonobviousness, as further discussed below.

27. I understand that claimed subject matter may be obvious in view of more than one item of prior art. I understand, however, that it is not enough to show simply that all the limitations of the claimed subject matter are spread throughout the prior art. Instead, for claimed subject matter to be obvious over multiple

references, there generally must have been some reason or motivation for one of ordinary skill in the art to combine the teachings of the prior art references to arrive at the claimed subject matter.

28. I have been informed that, in seeking to determine whether an invention that is a combination of known elements would have been obvious to a person of ordinary skill in the art at the time of the invention, one must consider the references in their entirety to ascertain whether the disclosures in those references render the combination obvious to such a person.

29. I have been informed and understand that, while not required, the prior art references themselves may provide a teaching, suggestion, motivation, or reason to combine, but that other times the motivation linking two or more prior art references is common sense to a person of ordinary skill in the art at the time of the invention.

30. I understand that a particular combination may be proven obvious merely by showing that it was obvious to try the combination. I have been informed that, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. I have further been informed and understand that a POSITA combines the

teachings of the prior art references and does not necessarily combine the embodiments of those teachings physically.

31. I further understand that an obviousness analysis recognizes that market demand, rather than scientific literature, often drives innovation, and that a motivation to combine references also may be supplied by the direction of the marketplace. For example, when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp because the result is likely the product not of innovation but of ordinary skill and common sense.

32. I have been informed that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. Thus, where all of the elements of a claim are used in substantially the same manner in devices in the same field of endeavor, the claim is likely obvious.

33. Additionally, I understand that a patent is likely to be invalid for obviousness if a person of ordinary skill can implement a predictable variation or if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. Therefore, when a work is

available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one.

34. I further understand that combining embodiments related to each other in a single prior art reference would not ordinarily require a leap of inventiveness.

35. I also understand that one of ordinary skill in the art must have had a reasonable expectation of success when combining references for claimed subject matter to be obvious.

36. I have been informed and I understand that factors referred to as “objective indicia of non-obviousness” or “secondary considerations” are also to be considered when assessing obviousness when such evidence is available. I understand that these factors can include: (1) commercial success; (2) long-felt but unresolved needs; (3) copying of the invention by others in the field; (4) initial expressions of disbelief by experts in the field; (5) failure of others to solve the problem the claimed subject matter solved; and (6) unexpected results.

37. I also understand that evidence of objective indicia of nonobviousness must be commensurate in scope with the claimed subject matter. I further understand that there must be a relationship, sometimes referred to as a “nexus,” between any such secondary indicia and the claimed invention. I also have been informed that even when they are present, secondary considerations may be unable to overcome

primary evidence of obviousness (*e.g.*, motivation to combine with predictable results) that is sufficiently strong.

38. Finally, I have been informed that one cannot use hindsight to determine that an invention was obvious.

39. I provide my opinions in this declaration based on the guidelines set forth above.

V. LEVEL OF SKILL IN THE ART

40. I have been informed and understand that the level of ordinary skill in the relevant art at the time of the invention is relevant to inquiries such as the meaning of claim terms, the meaning of disclosures found in the prior art, and the reasons a POSITA may have for combining references.

41. I have been informed and understand that factors that may be considered in determining the level of ordinary skill include: (1) the education of the inventor; (2) the type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) education level of active workers in the relevant field. I have been further informed and understand that a POSITA is also a person of ordinary creativity.

42. A POSITA at the time of the alleged invention would, in my opinion, have had at least a Bachelor's Degree in computer science, electrical engineering, or

a related subject, and at least two years of experience working with augmented reality, portable electronic devices, mobile computing, databases, computer networks, or related technologies. A more advanced degree can substitute for work experience. This POSITA would be aware of and generally knowledgeable about the structure and operation of augmented reality devices and techniques as well as different databases and computer networks.

43. In view of my educational background and work experience, I am a person of more than the ordinary level of skill in the art of the 421 Patent and was so by 2010 (when the first application relating to the 421 Patent was filed). In forming my opinions, I have drawn on my academic background and professional experiences. My opinions herein, however, were formed taking into account the perspective of a POSITA.

VI. THE 421 PATENT'S EFFECTIVE FILING DATE

44. I understand that the application leading to the 421 Patent was filed on December 5, 2014.

45. Based on my review of the 421 Patent, I note that it also references a September 27, 2010 provisional application filing date on its face.

46. For purposes of this declaration, I have been instructed to use September 27, 2010 as the effective filing date of the 421 Patent. My opinions in this declaration were formed from the perspective of a POSITA as of September 27,

2010, including both the knowledge of a POSITA at that time as well as how a POSITA would have understood the prior art. Nevertheless, the opinions I express in this declaration would be the same regardless of whether the 421 Patent has a September 27, 2010 or a later December 5, 2014 effective filing date.

VII. OVERVIEW OF THE TECHNOLOGY BEFORE THE FILING OF THE 421 PATENT

A. Parking Management System

47. Finding a vacant parking space is a common problem in most urban cities, particularly in popular and well-travelled places like shopping complexes, stadiums, and tourist attractions. EX1021 (“Idris”), 114. This problem arises because patrons typically use their own transportation, resulting in many vehicles competing for a few vacant parking spaces. *Id.* The lack of well-organized and helpful parking systems are also at fault for causing this problem. *Id.* To tackle this problem, smart parking systems have been implemented throughout many countries around the world. *Id.*

48. Parking management systems refers to technology which allows people to dynamically reserve and pay for parking. Idris, 114. Parking management systems also provide another way for drivers to reserve a parking space at their desired car park facility to ensure a vacant parking space is available

when they arrive. The reservation for a parking space can be made via SMS, phone call, the Internet, and/or PDA. *Id.*, 115.

49. Parking management systems were well known prior to the filing of the 421 Patent in 2010. The 421 Patent itself recognizes that parking status systems were known in the art and that they included many features claimed in the 421 Patent.

50. The 421 Patent admits that it was known for parking status systems to show a parking space's payment status (paid or unpaid) on an electronic map (421 Patent, 3:3-8) and to display graphical information about the parking space (*id.*, 3:15-16).

51. The 421 Patent also admits that it was known to accept payments for parking spaces using coins or cashless payments (via a mobile phone payment system, a smart card loaded with funds, or by wireless/web communications). 421 Patent, 2:30-38, 2:60-3:2, 3:19-22.

52. The 421 Patent also admits that it was known to utilize a subscription model to accept payment for parking spaces, including prepayment. 421 Patent, 3:19-23.

53. The 421 Patent also admits that it was known for parking enforcement officers to manually use location and payment status information to determine if a parking space is paid for. *See, e.g.*, 421 Patent, 2:46-52.

54. The 421 Patent does not claim to have invented smart parking management systems. Instead, the 421 Patent applicant appears to believe that his invention was the combination of a smart parking management system with an augmented reality interface to allow enforcement officers to view actual parking spaces overlaid with information about the parking meters. 421 Patent, 4:9-19.

B. Introduction to Augmented Reality

55. The use of augmented reality (“AR”)¹ in parking management systems, however, was also well-known. EX1007² (“Matsumoto”); EX1009 (“Haynes”). AR uses a computer and a display to supplement and/or overlay (*i.e.*, “augment”) an individual’s view or experience of the real world. The supplementation and/or overlaying of additional information typically relates to one or more of the human senses, *e.g.*, sight and sound.

56. In the broadest sense, supplementation or overlay refers to digital content (*e.g.*, text, images, or videos) displayed on images of the real world. For example, as a user captures real-time images of her environment, an AR application may annotate the environment with relevant information.

¹ AR is closely related to virtual reality, or “VR,” which is typically characterized as the complete replacement of the real world with a virtual world.

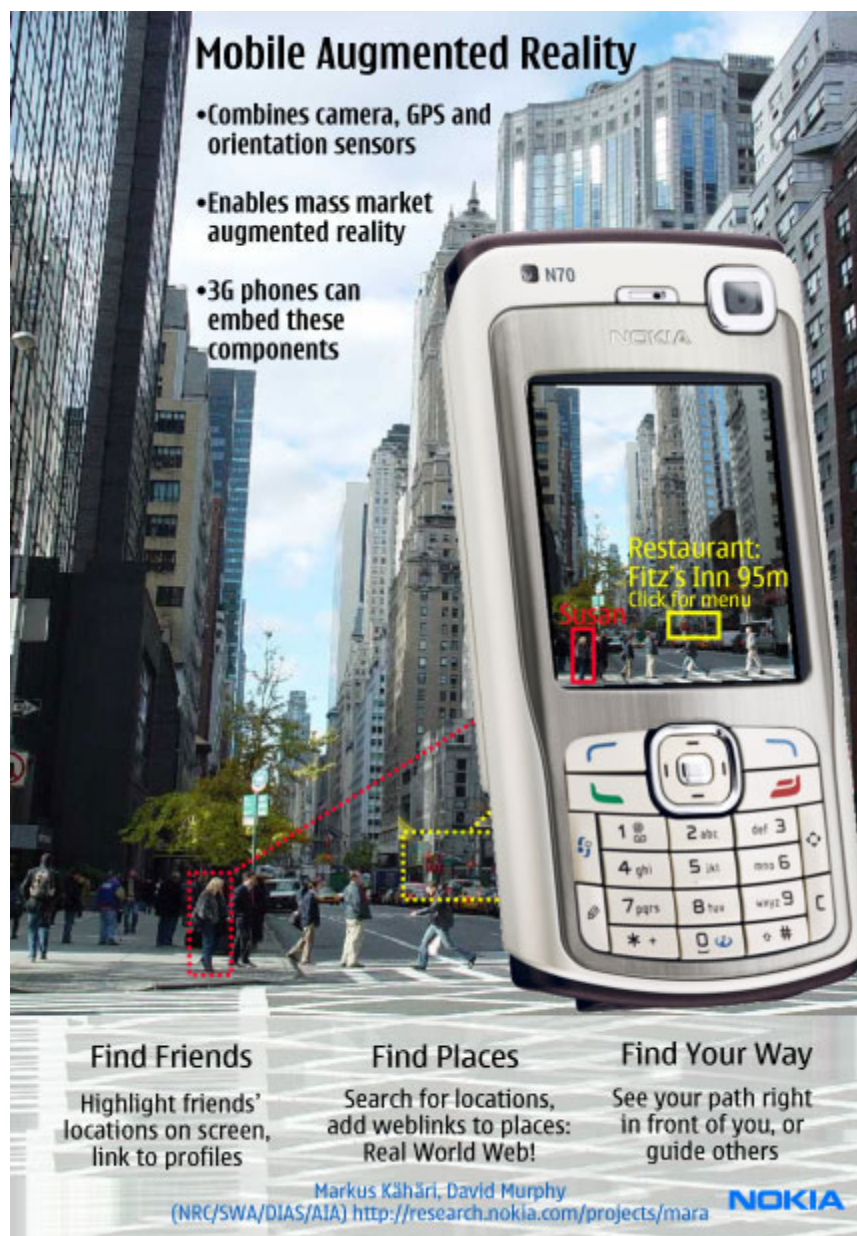
² I understand that EX1007 is a Certified English Translation of EX1006.

57. Some AR systems, including some of the earliest systems, used head-mounted displays, which typically rely on small displays and optics placed in front of a user's eyes to provide virtual objects. More recently, handheld devices, including camera phones, smart-phones, and tablets, facilitate AR applications.

C. History of Augmented Reality

58. With this foundation in mind, I now turn to the history of augmented reality. I understand that the 421 Patent's claims concern AR in the visual domain. Thus, while my analyses are equally relevant to non-visual AR, I focus much of the present technological background on visual applications.

59. AR applications on handheld devices became available in the early 2000s and AR on head-worn devices has been demonstrated for outdoor applications by at least the mid/late 90s. EX1022 ("Feiner") (published 1997); *see also* EX1023 ("Abbott") (published 2002). Applications like BatPortal and AR-PDA operated on PDA devices while applications like Nokia MARA ran on camera phones. Available on phones like the Nokia 6680, Nokia MARA presents images and text over continuous real-world images from the user's camera. EX1024, Gregory Maubon, A little bit of history from 2006: Nokia MARA project, <https://www.augmented-reality.fr/2009/03/un-petit-peu-dhistoire-de-2006-projet-mara-de-nokia/> ("Maubon"), at 001. Depicted below:



60. The AR applications may exploit sensors in the handheld device, including GPS and wireless sensors as well as the device's video camera, to provide mixed reality content relevant to a user's location and/or surroundings. Feiner, 1, 3-7; Abbott, [0002]. Location-based augmented reality uses the physical position and orientation of the AR capable device (or, by proxy, the device user) to

provide context-specific content. Feiner, 1, 5-7; Abbott, [00035], Fig. 2.

Location-based augmented reality is but one sub-field in the larger field of location-based tracking or location-based services, defined as software which uses location to provide information or services to users. Feiner, 1, 5-7; *see also* Abbott, [00035], Fig. 2. As I discuss in detail below, AR devices were also well-known to be used in parking management systems, such as in Matsumoto and Haynes. Matsumoto; Haynes.

61. In addition, using wireless technology such as Wi-Fi or cellular networks, these AR devices can often communicate with remote servers or other user devices to provide virtual content or objects that may not be stored locally. This virtual content may change over time to reflect changes in the user's real-world surroundings. Feiner, 1, 4-7.

62. The 421 Patent does not claim to have invented location-based tracking or AR location-based tracking.

D. Object Recognition in Augmented Reality Systems

63. Some AR applications use object recognition for overlays and superimposition. Two forms of object recognition exist: appearance models and feature tracking. Appearance models rely on a comparison of detected real-world objects to templates. With feature tracking, characteristics of real-world objects are tracked, and using the data, the AR application builds a virtual model to

superimpose over the corresponding real-world object. Ideally, objects in the real world are tracked with six-degrees of freedom (x,y,z, as well as yaw, pitch, and roll) relative to the AR device to seamlessly integrate the objects into the real-world scene. The 421 Patent does not claim to have invented AR object recognition.

E. Graphical User Interfaces

64. Graphical user interfaces (GUIs) were also well-known as of the 1970s. For example, Xerox PARC developed the Alto personal computer in 1973, which had a bitmapped display (where individual pixels were addressable) and used the Windows Icons Menus and Pointer (WIMP) interaction model (*e.g.*, a mouse). Xerox's work developing GUIs for desktop computers was advanced further by Apple, which released the Macintosh personal computer in 1984, also containing a WIMP GUI. During the 1980s, there were many different GUIs developed for UNIX machines, such as X Windows. By 1990, when Windows 3 was released for personal computers, GUIs were ubiquitous. Moreover, their use expanded dramatically after that with the rise of World Wide Web browsers and different types of mobile computing devices. The 421 Patent does not claim to have invented graphical user interfaces.

F. Databases

65. Databases were also very well known in the art, since at least the 1970s. E.F Codd, a scientist working at IBM, first defined a relational database in 1970. Such databases store and represent data to users as a collection of tables, each table being made up of a set of rows and columns. Oracle released its first database software in 1979.

66. A database table is made up of a list of records, each of which is represented by one row in the table. Each record captures the data about one instance of whatever set of information is being stored in the database. For example, a customer table will have each customer represented by one row in the database. Each record is made up of a set of fields, each of which captures one or more attributes that are related to the instance. For example, a customer record could include fields for the customer's name, address, telephone number, etc. In the context of a parking management system database, each customer record could include fields for the customer's name, the parking spaces the customer is using, and other desired parking information. The 421 Patent does not claim to have invented databases. The use of databases in parking status systems was well known before 2010. 421 Patent, 3:32-40; Ivey, [0032]; Ward, [0042].

VIII. THE 421 PATENT

A. Overview

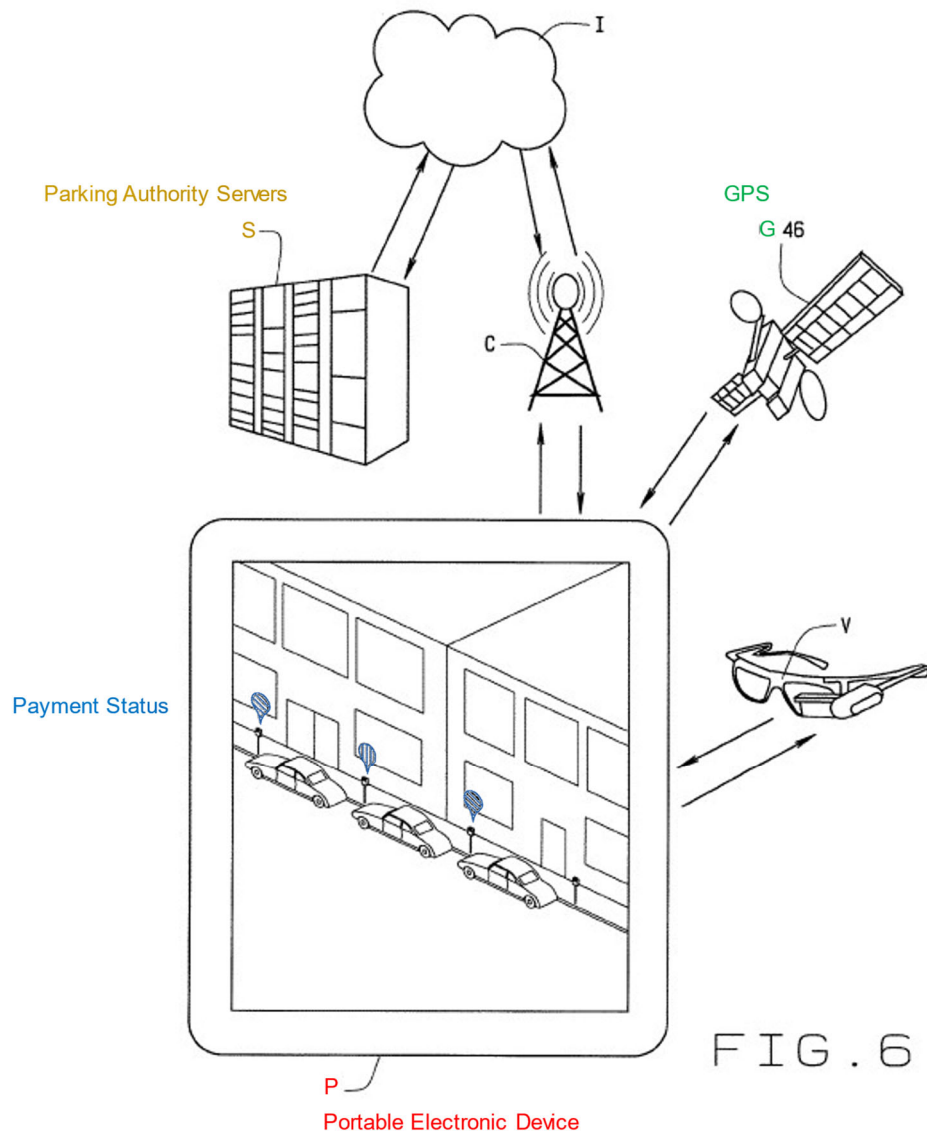
1. Background

67. The 421 Patent relates to a parking status system that integrates position and parking meter status (*i.e.*, paid or unpaid) into a common visual image updated in real-time on a portable electronic device for parking enforcement. 421 Patent, 4:26-29. The parking status system also includes the acceptance of payments for parking spaces, including prepayment and subscription payments. *Id.*, 4:19-22; 5:50-62.

2. The Alleged Invention

68. The 421 Patent describes a parking payment status system comprising a server with two databases (parking spaces and payment status) and a portable electronic device. The system determines the payment status (*i.e.*, paid or unpaid) of parking spaces near a user of the portable electronic device and displays the payment status in a real-time camera view on the screen of the device. 421 Patent, 16:62-67; *see also id.*, 15:7-16:39.

69. Fig. 6 (*below*) shows the portable electronic device screen and the payment status of the parking spaces near the user. 421 Patent, Fig. 6 (annotated below); 13:28-49, 14:7-21.



70. The **portable electronic device (P)** communicates (as at C) via the internet (I) to the parking authority servers (S). 421 Patent, 13:34-36. The **server (S)** knows the parking space locations and cross references the **portable electronic device (P)**'s location, through **GPS (G)**. *Id.*, 9:8-12. The **server (S)** provides to the user the **payment status** of the nearby parking spaces. *Id.*, 9:12-15. The method composes the resulting scene by displaying the **payment status** of the nearby

parking spaces upon the real-time camera view on the screen of the portable electronic device (P). *Id.*, 9:34-36, 16:62-67.

B. Prosecution History of the 421 Patent

71. The 421 Patent stems from Application No. 14/562,149, filed on December 5, 2014, which was a continuation-in-part of Application No. 13/245,385, filed on September 26, 2011, which claims priority to Provisional Patent Application No. 61/386-645, filed September 27, 2010. Claims 1-7 issued with few amendments to the originally-filed claims. EX1002, 319-322.

72. In a Pre-Interview First Office Action, the Examiner objected to and rejected the claims on several grounds, including 35 U.S.C. § 103. EX1002, 80-89. The Examiner based the obviousness rejection on U.S. Patent Publ. No. 2012/0078686 to Bashani and WIPO Publ. No. 2005/086098 to Fraier. *Id.*

73. The Applicant then had an interview with the Examiner. EX1002, 273-274. Applicant contended that “the Bashani and Fraier references cannot be combined because Bashani senses locations uses (sic) defined GPS coordinates, whereas Fraier just uses NFC to communicate with tags that are indicative of locations.” *Id.*, 273. The Examiner “recommended amending the claims to only include subject matter disclosed by the parent application in order to disqualify the Bashani reference.” *Id.*, 273. The Examiner further recommended that the

Applicant amend the claims to incorporate the “real time view” limitation. *Id.*, 247.

74. In response, the Applicant submitted a Supplemental Amendment canceling the claims directed to subject matter not disclosed by the parent application and amending the remaining claims. EX1002, 242-249. Applicant argued that these amendments, incorporating the “real time view” into the independent claims, distinguished the cited prior art. *Id.*, 247.

75. After an interview, in a First Action Interview—Office Action Summary, the Examiner rejected the claims on 35 U.S.C. §§ 102 and 103 grounds over Bashani, because of a defect in Applicant’s priority claim. EX1002, 262-269. Applicant’s petition to correct the priority claim was eventually granted, and in response to the Applicant’s amendments and the corrected priority claim, the Examiner issued claims 1-7. *Id.*, 330-338.

C. The 421 Patent’s Claims

76. For reference, claims 1-7 of the 421 Patent are reproduced below:

1. A method for representing the parking status of a plurality of parking spaces to a screen of a user's portable electronic device upon a real time camera view, any of said at least one parking space being one of PAID for current payment and UNPAID upon exhaustion of payment, any of a plurality of subscribers utilizing said method to

reserve at least one of the plurality of parking spaces and then to pay for at least one of the plurality of parking spaces, the method comprising:

- (a) assembling a database upon a computer of said plurality of parking spaces, said database including geographic locations of said plurality of parking spaces and time limits applicable to each of said plurality of parking spaces;
- (b) updating a database upon a computer of subscribers, said database including a list of parking spaces reserved by each subscriber, a list of parking spaces paid for by each subscriber, and a list of the expiration times for each paid for parking space of each subscriber;
- (c) calculating a location of said user, said calculating a location of said user adapted to utilize a location finding feature of said user's portable electronic device;
- (d) determining upon a computer a location of one of said plurality of parking spaces by comparing the location of said user to said database of said plurality of parking spaces and selecting one of said plurality of parking spaces within eight to ten feet of the position of said user;

- (e) comparing upon a computer the location of one of said plurality of parking spaces with said database of subscribers further comprising comparing upon a computer the location of one of said plurality of parking spaces against said list of parking spaces paid for by said subscribers for a match between said location and said list of parking spaces paid for by said subscribers;
- (f) upon detecting a match between said location and said list of parking spaces paid for by said subscribers, comparing the matched parking spaces to said list of expiration times and upon detecting the matched parking spaces exceeding an expiration time displaying upon said user's screen an UNPAID payment indicia upon an image of the matched parking space, wherein the user may execute enforcement measures upon any vehicle in said matched parking space showing said UNPAID indicia;
- (g) wherein said method transforms upon a computer location data of said plurality of parking spaces and payment status data of said plurality of parking spaces into indicia of UNPAID parking spaces;
- (h) said comparing the matched parking space to said list of expiration times and upon detecting the

matched parking space exceeding an expiration time and said method places said indicia of UNPAID on an image of a matched parking space upon the real time camera view on the screen of a user's device for enforcement.

2. The method for representing the parking status of claim 1 further comprising: opening an account for each of said subscribers wherein said account permits each of said subscribers to reserve at least one of said plurality of parking spaces and permits each of said subscribers to pay for at least one of said plurality of parking spaces utilizing means of electronic payment.

3. The method for representing the parking status of claim 1 further comprising: said indicia of UNPAID overlaying upon said user's screen one of the word UNPAID, a colored logo, a circle with a bar, and a letter X.

4. The method for representing the parking status of claim 1 further comprising: said indicia of UNPAID including an audible recitation.

5. A method for representing the parking status of a plurality of parking spaces to a screen of a user's portable electronic device upon a real time camera view, any of said at least one parking space being one of PAID for current

payment and UNPAID upon exhaustion of payment, any of a plurality of subscribers utilizing said method to reserve at least one of the plurality of parking spaces and then to pay for at least one of the plurality of parking spaces, the method comprising:

- (a) assembling a database of said plurality of parking spaces, said database including geographic locations of said plurality of parking spaces and time limits applicable to each of said plurality of parking spaces and storing said parking space database upon a computer server;
- (b) updating a database of subscribers, said database including a list of parking spaces reserved by each subscriber, a list of parking spaces paid for by each subscriber, a list of the expiration times for each paid for parking space of each subscriber, and storing said subscriber database upon a computer server, and further including enrolling each of said subscribers into a membership plan for parking payment;
- (c) calculating a location of said user, said calculating a location of said user adapted to utilize a location finding feature of said user's portable electronic device;

- (d) determining upon a computer server a location of one of said plurality of parking spaces by comparing the location of said user to said database of said plurality of parking spaces and selecting one of said plurality of parking spaces within eight to ten feet of the position of said user;
- (e) comparing upon a computer server the location of one of said plurality of parking spaces with said database of subscribers further comprising comparing upon a computer the location of one of said plurality of parking spaces against said list of parking spaces paid for by said subscribers for a match between said location and said list of parking spaces paid for by said subscribers
- (f) wherein upon detecting a match between said location and said list of parking spaces paid for by said subscriber, comparing the matched parking space to said list of expiration times and further upon detecting the matched parking spaces exceeding an expiration time displaying upon said user's screen an UNPAID indicia upon an image of the matched parking space, wherein the user may execute enforcement measures upon any vehicle in said matched parking space showing said UNPAID indicia;

- (g) wherein said method transforms upon a computer location data of said plurality of parking spaces and payment status data of said plurality of parking spaces into indicia of UNPAID parking spaces;
- (h) said comparing the matched parking space to said list of expiration times and upon detecting the matched parking space exceeding an expiration time and said method places said indicia of UNPAID on an image of a matched parking space upon the real time camera view on the screen of a user's device for enforcement.

6. The method for representing the parking status of claim 5 further comprising: wherein said indicia of UNPAID includes one of the word UNPAID, a colored logo, a circle with a bar, and a letter X.

7. The method for representing the parking status of claim 5 wherein: said indicia of UNPAID includes an audible signal transmitted from a computer server to the user's portable electronic device.

IX. CLAIM CONSTRUCTION

77. I am not a legal expert or an attorney and offer no opinions on the law.

I understand that claim construction is a matter of law. As discussed in Section IV.A above, I have been informed by counsel of the legal standards that apply to

claim construction in an *inter partes* review and I have applied them in forming my opinions.

78. In my opinion, for purposes of this proceeding, the terms of the 421 Patent's claims do not require further construction and should be afforded their plain and ordinary meaning. Should Patent Owner advance any different constructions, I reserve the right to address those in a reply declaration.

X. UNPATENTABILITY ANALYSIS

79. I have reviewed and analyzed the prior art references and materials listed in **Section III** above.

80. For the reasons I explain in greater detail below, it is my opinion that before the earliest possible filing date of the 421 Patent in 2010, a POSITA would have considered claims 1-7 of the 421 Patent to be unpatentable as obvious over the prior art discussed in this declaration.

Ground	Claim(s)	Prior Art Asserted
1	1-3, 5, 7	Ivey in view of Matsumoto, Tillotson, and the knowledge of a POSITA renders the claims obvious under 35 U.S.C. §103
2	4, 6	Ivey in view of Matsumoto, Tillotson, Slemmer, and the knowledge of a POSITA renders the claims obvious under 35 U.S.C. § 103
3	1-3, 5, 7	Ward in view of Haynes, Tillotson, and the knowledge of a POSITA renders the claims obvious under 35 U.S.C. §103

Ground	Claim(s)	Prior Art Asserted
4	4, 6	Ward in view of Haynes, Tillotson, Slemmer, and the knowledge of a POSITA renders the claims obvious under 35 U.S.C. § 103

XI. THE PRIOR ART

A. Overview of the Prior Art

81. The following paragraphs provide an overview of the main prior art references I discuss throughout this declaration.

1. US Patent Application Publication No. 2006/0059037 (Ex. 1005, “Ivey”)

82. Ivey indicates on its face that it published on March 16, 2006. Ivey, Cover. In view of this date of publication, which predates the 421 Patent’s earliest possible filing date by more than a year, I understand that Ivey is prior art to the 421 Patent under at least 35 U.S.C. § 102(b) (pre-AIA) and/or 35 U.S.C. § 102(a)(1) (post-AIA).

83. Although Ivey is cited on the face of the 421 Patent, it was not discussed by the Examiner. *See generally* EX1002.

84. Ivey relates to the local enforcement of remotely managed parking systems. Ivey, Abstract.

85. Ivey's system has a "parking payment status map" that is presented on a display of a hand-held computer carried by a parking control officer. Ivey, [0020]-[0021].

86. Ivey's system is shown in the below annotated figures:

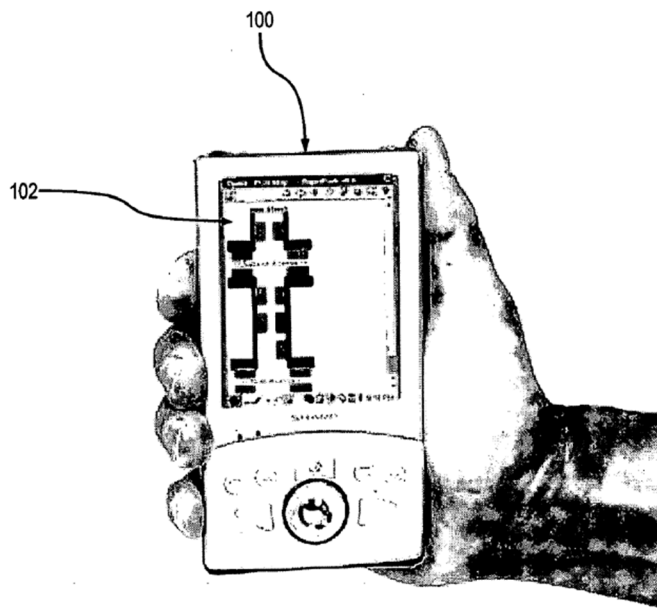


FIGURE 1

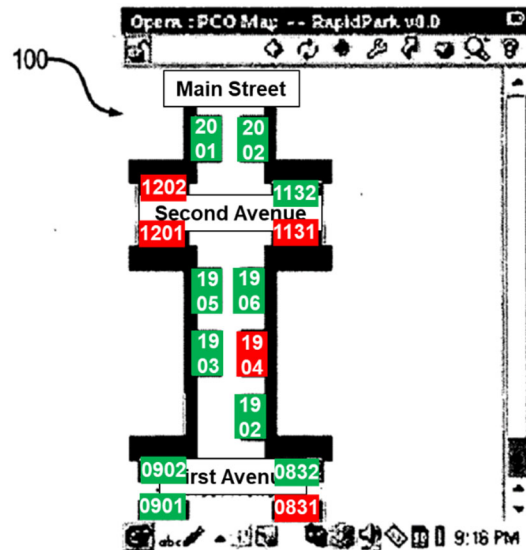


FIGURE 3

Ivey, Figs. 1, 3 (annotated). The below paragraph provides additional details regarding the depicted parking payment status map.

87. The parking payment status map 100 includes spatially-related representations of parking spaces and such representations indicate a paid or unpaid state of each represented parking space (*e.g.*, paid spaces in green and unpaid in red). Ivey, [0022], Fig. 3.

88. Ivey explains that the parking control officer receives parking payment status information for multiple parking spaces simultaneously upon their portable electronic device. Ivey, [0020].

**2. Japanese Patent Application Publication No. 2008-217835
(Ex. 1006, “Matsumoto”)**

89. Matsumoto indicates on its face that it published September 18, 2008. *See* Matsumoto, Cover. In view of this date of publication, which predates the 421 Patent’s earliest possible filing date by more than a year, I understand that Matsumoto is prior art to the 421 Patent under at least 35 U.S.C. § 102(b) (pre-AIA) and/or 35 U.S.C. § 102(a)(1) (post-AIA).

90. Matsumoto is not cited on the face of the 421 Patent. It also was not discussed or mentioned during the 421 Patent’s prosecution history.

91. Matsumoto was published in Japanese. Throughout the declaration, unless otherwise cited, I will refer to and cite to a certified translation (EX1007) of Matsumoto.

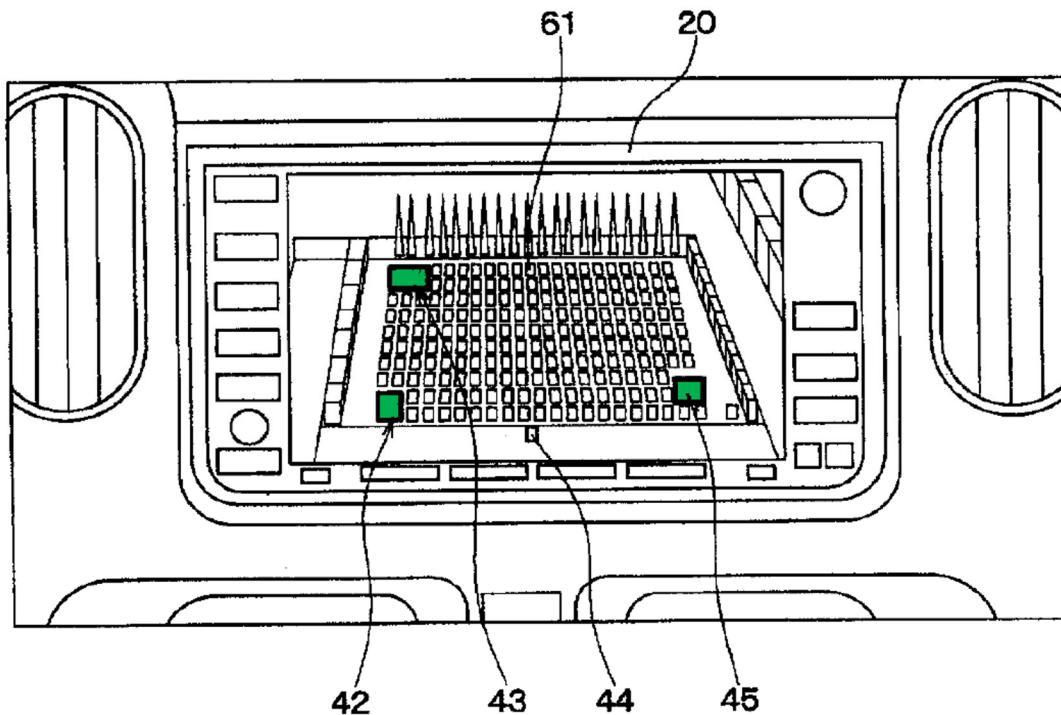
92. Matsumoto relates to a parking lot guidance system. Matsumoto, [0006], [0061].

93. Matsumoto explains that the disclosed system receives a live-action image of the relevant area, *i.e.*, the parking lot. Matsumoto, [0060], Fig. 3. The system then processes the image and generates “a vacant space-highlighted live-

action image.” *Id.*, [0060], Fig. 3. The generated image includes a visual indicator superimposed over the live-action image to identify the location of vacant parking spaces. *Id.*, [0060].

94. Matsumoto’s generated image is shown in the below annotated figure.

【 図 6 】



EX1006, Fig. 6. The below paragraph provides additional details regarding the depicted system.

95. The visual indicator of a “bold line” encircling an area (here, indicated with green) may be superimposed on the image of the vacant parking space. Matsumoto, [0060].

3. U.S. Patent Application Publication No. 2008/0114675 (Ex. 1008, “Ward”)

96. Ward indicates on its face that it published May 15, 2008. Ward, Cover. In view of this date of publication, which predates the 421 Patent’s earliest possible filing date by more than a year, I understand that Ward is prior art to the 421 Patent under at least 35 U.S.C. § 102(b) (pre-AIA) and/or 35 U.S.C. § 102(a)(1) (post-AIA).

97. Ward is not cited on the face of the 421 Patent. It also was not discussed or mentioned during the 421 Patent prosecution history.

98. Ward relates to a parking information system that includes an enforcement device which displays a graphical user interface (GUI) that identifies a plurality of parking spaces and indicia associated with each of the plurality of parking spaces. Ward, [0007].

99. Ward also uses GPS and “layers” of data to present an overlaid view (augmented reality) to users, as shown in the below figure:

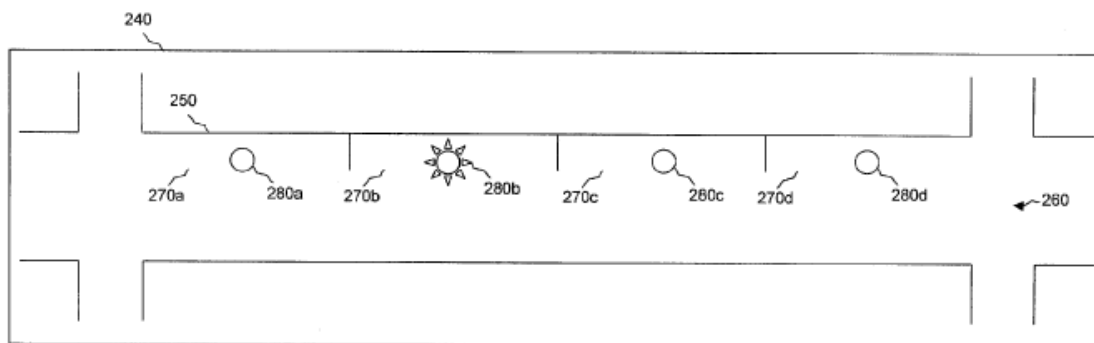


Figure 3b

Ward, Fig. 3b. The below paragraphs provide additional details regarding the depicted system.

100. The screen 240 includes a map 250. Ward, [0046]. The virtual street 260 corresponds to the actual street 200 and a plurality of virtual parking spaces 270 correspond to the actual parking spaces 210. *Id.*, [0046].

101. An indicator 280 is associated with each of the virtual parking spaces 270 to provide a graphical depiction of whether a fee has currently been paid for the parking meter 20 associated with the actual parking space 210 depicted by the virtual parking space 270. Ward, [0046]. Specifically, when a fee is paid for one of the parking meters 20, the corresponding indicator 280 will provide an indication that the fee has been paid. *Id.*, [0046].

4. U.S. Patent No. 7,123,166 (Ex. 1009, “Haynes”)

102. Haynes indicates on its face that it issued October 17, 2006. Haynes, Cover. In view of this date of issuance, which predates the 421 Patent’s earliest possible filing date by more than a year, I understand that Haynes is prior art to the 421 Patent under at least 35 U.S.C. § 102(b) (pre-AIA) and/or 35 U.S.C. § 102(a)(1) (post-AIA).

103. Haynes is not cited on the face of the 421 Patent. It also was not discussed or mentioned during the 421 Patent’s prosecution history.

104. Haynes relates to a system for displaying dynamic parking space information in real-time, as shown in the below figure:

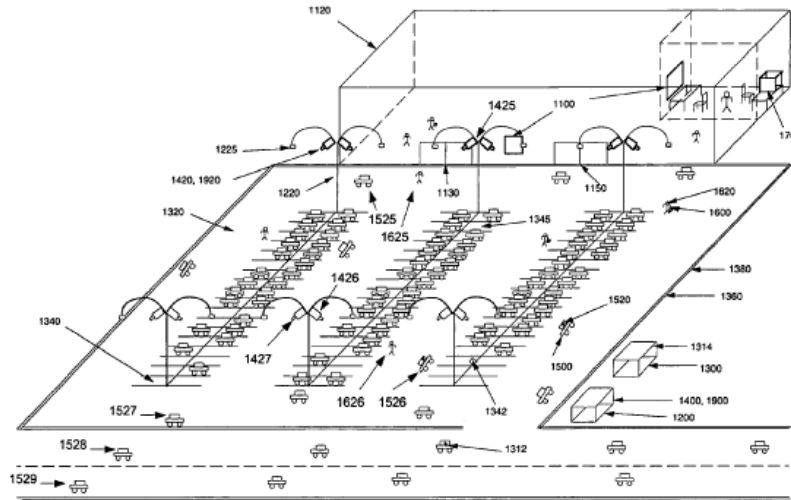


Fig. 1

Haynes, Fig. 1. The below paragraphs provide additional details regarding the depicted system.

105. Haynes discloses the display on a personal interaction device of a variety of different representations of a parking lot, including displaying an actual representation (*i.e.*, an image) of the parking lot depicted from a specified or variable location such as out the front windshield of a vehicle. Haynes, 12:62-13:8, 13:33-43. This representation can be dynamically updated in real time. *Id.*, 13:33-43. This representation can be enhanced with additional data about the parking spaces. *Id.*, 3:36-43.

5. U.S. Patent Application Publication No. 2006/0170566 (Ex. 1010, “Slemmer”)

106. Slemmer indicates on its face that it published August 3, 2006. Slemmer, Cover. In view of this date of publication, which predates the 421 Patent’s earliest possible filing date by more than a year, I understand that Slemmer is prior art to the 421 Patent under at least 35 U.S.C. § 102(b) (pre-AIA) and/or 35 U.S.C. § 102(a)(1) (post-AIA).

107. Slemmer is not cited on the face of the 421 Patent. It also was not discussed or mentioned during the 421 Patent’s prosecution history.

108. Slemmer relates to a method of directing parking in a parking lot. Slemmer, [0039]. In addition, Slemmer describes converting digital parking space data into audible recitations and audibly communicating parking space location data to users’ mobile devices. *Id.*, [0040].

6. U.S. Patent Publication No. 2006/0250278 (Ex. 1011, “Tillotson”)

109. Tillotson indicates on its faces that it published November 9, 2006. Tillotson, Cover. In view of this date of publication, which predates the 421 Patent’s earliest possible filing date by more than a year, I understand that Tillotson is prior art to the 421 Patent under at least 35 U.S.C. § 102(b) (pre-AIA) and/or 35 U.S.C. § 102(a)(1) (post-AIA).

110. Tillotson is not cited on the face of the 421 Patent. It also was not discussed or mentioned during the 421 Patent's prosecution history.

111. Tillotson relates to a method for determining the availability of a plurality of parking spaces, reserving one or more of such available parking spaces, and monthly subscriptions for parking spaces. Tillotson, Abstract, [0044], [0065].

112. Tillotson relates to parking space information and reservation system (PSIRS). Tillotson, [0023], Fig. 2:

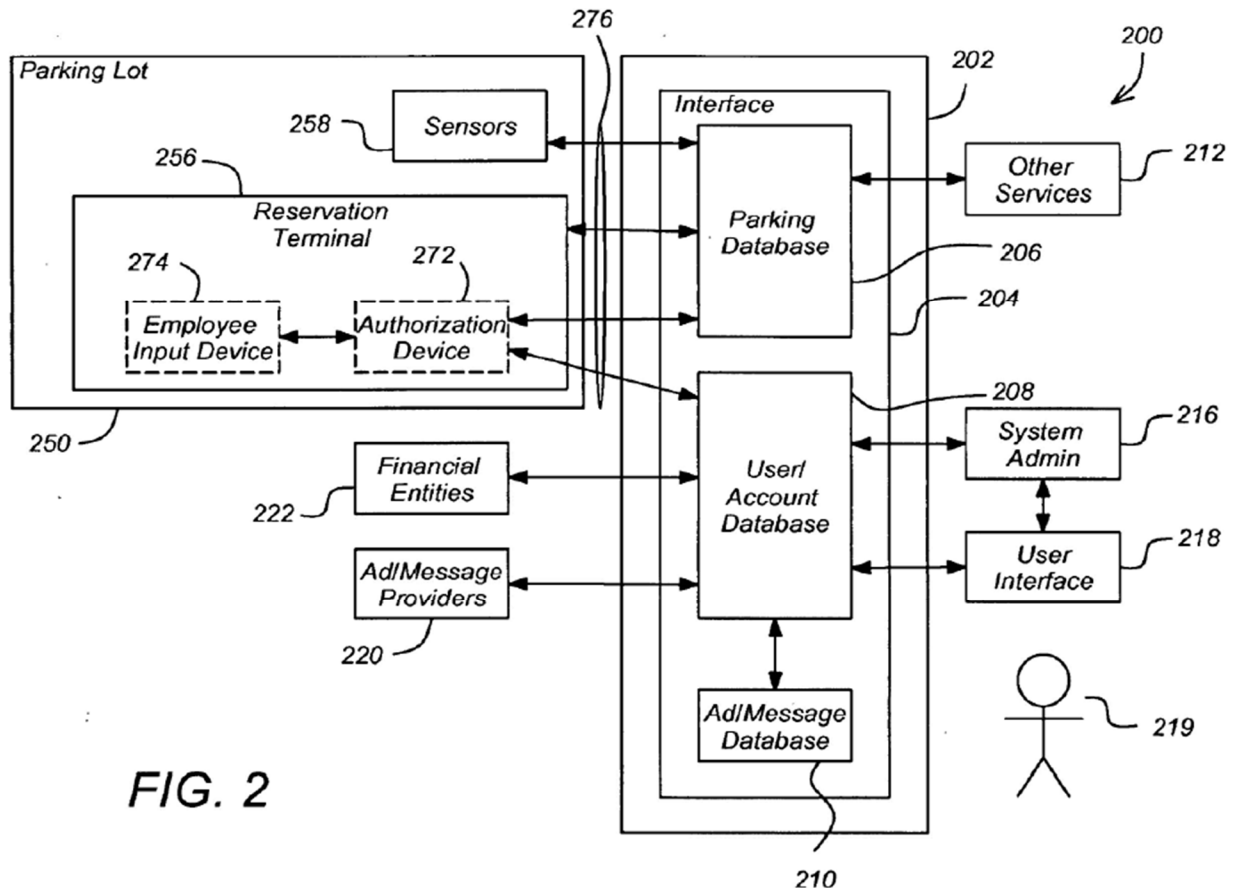


FIG. 2

The below paragraphs provide additional details regarding the depicted system.

113. Tillotson includes an operations center 202, which in turn includes a parking database 206, a user account database 208, and an optional advertisement/message database 110. Tillotson, [0023]. The PSIRS includes users 219 who are subscribers that have paid a periodic charge for access to the PSIRS 200, users 219 who pay a per-use charge, and/or users 219 who are provided access for free. *Id.*, [0023].

114. Tillotson discloses a system that accepts “payment for access to the PSIRS to allow reservation of parking spaces 304, or for access to the parking spaces 304 themselves.” Tillotson, [0065]. Tillotson also discloses several methods of electronic payment for the parking spaces including that “[i]ndividual users 219 may pay a flat monthly subscription rate, a fee-per-service with monthly billing, or a payment at time of use via online credit card data or services like PAYPAL.” *Id.*, [0065].

XII. GROUND 1: IVEY IN VIEW OF MATSUMOTO, TILLOTSON, AND THE KNOWLEDGE OF A POSITA RENDERS OBVIOUS CLAIMS 1-3, 5-6

115. In my opinion, a POSITA would have considered Ivey, Matsumoto, and Tillotson to be within the scope of the prior art and highly relevant to the patentability of the 421 Patent’s claims.

116. In my opinion, moreover, when viewed and considered in light of the knowledge of a POSITA, Ivey, Matsumoto, and Tillotson together disclose all the limitations of claims 1-3, 5-6 of the 421 Patent and render them obvious.

117. In addition, not only would a POSITA have been motivated to combine and collectively consider the teachings of these references to arrive at the subject matter claimed by the 421 Patent, but they would have had a reasonable expectation of success when doing so.

A. Claim-by-Claim Analysis

1. Claim 1

a. [1.PRE]

“A method for representing the parking status of a plurality of parking spaces to a screen of a user's portable electronic device upon a real time camera view, any of said at least one parking space being one of PAID for current payment and UNPAID upon exhaustion of payment, any of a plurality of subscribers utilizing said method to reserve at least one of the plurality of parking spaces and then to pay for at least one of the plurality of parking spaces, the method comprising:”

118. In my opinion, to the extent the preamble is limiting, Ivey in view of Matsumoto and Tillotson teach the preamble.

119. Ivey explains that it relates to “the field of computer-implemented parking payment status displays, and more specifically to a particularly efficient graphical representation and intuitive user interface by which a parking control officer can verify remotely administered payment of parking fees.” Ivey, [0001].

120. Ivey's system includes a display that "represent[s] payment status of multiple parking locations," "paid locations are represented in green and unpaid locations are represented in red," and "superimpos[ing] ... shapes over a map ...using location data." Ivey, Abstract, [0006],[0038], Fig. 3.

121. As I note above, Ivey teaches that its parking status information is displayed as a graphical representation of parking spaces in the area nearby the user. Ivey, [0022]. Ivey does not teach the use of a real-time camera view to display parking information, but Matsumoto does. A POSITA would have readily appreciated that Matsumoto teaches the use of a camera view of a parking lot, including displaying additional parking information superimposed on the camera view. I discuss Matsumoto in detail in my analysis of limitation [1.H] below. I note further here and below that Matsumoto teaches that its camera view can be a live-action image, which a POSITA would have understood is "real-time" as claimed.

122. Matsumoto explains that it relates to "a guidance system which enables a user to smoothly move to a vacant space in a parking lot, on the basis of the user's own selection." Matsumoto, Abstract.

123. Matsumoto's system includes "images that allow the position of the vacant parking space in the parking lot to be seen, include live-action images, vacant space-highlighted live-action images, and simplified graphic images" enabling the

positional relationship between the current position of the vehicle and vacant parking spaces to be determined. Matsumoto, [0057]-[0059].

124. Tillotson explains that it relates to “monitoring and reserving parking spaces.” Tillotson, [0002].

125. Tillotson’s system includes a parking space information and reservation system (PSIRS). Tillotson, [0023]. The PSIRS permits users to reserve parking spaces by providing access to subscribers who have paid a periodic charge for access (*i.e.*, a reservation system), and permits users to pay a per-use charge (*i.e.*, a payment system). *Id.*, [0023]. Tillotson also describes a system that accepts “payment for access to the PSIRS to allow reservation of parking spaces..., or for access to the parking spaces... themselves” (*i.e.*, the claimed payment system). *Id.*, [0065].

126. A POSITA would have readily appreciated that Ivey’s system could have been adapted in view of Tillotson’s teachings of a reservation system that allows users to reserve spaces and then pay for those spaces on a per-use basis. Such a system would provide added flexibility in allowing users to select parking spaces in advance of when the users actually intended to park in those spaces.

b. [1.A]

“assembling a database upon a computer of said plurality of parking spaces, said database including geographic locations of said plurality of parking spaces and time limits applicable to each of said plurality of parking spaces;”

127. In my opinion, Ivey teaches the claimed limitation.

128. Ivey explains that its parking system server 502 assembles a “parking database 604” that contains information, such as, “user records 608,” “parking space records 610,” “parking type records 612,” and “parking event records 614.” Ivey, [0032].

129. As of the filing of the 421 Patent, a POSITA would have understood that Ivey’s “server computer system” would include the claimed “database on a computer.” Ivey explains that its parking system server utilized a “server computer system.” Ivey, [0005]. Ivey further explains that its parking system server 502 includes a “parking database 604.” *Id.*, [0032]. Thus, Ivey teaches a database on a computer, as claimed. In my opinion, Ivey’s parking database is the claimed “database upon a computer of said plurality of parking spaces.”

130. Further, in my opinion, Ivey’s parking database includes the claimed “geographic locations of said plurality of spaces.” Ivey’s parking space records 610 include “geographical location of the parking space” from a “street map database 606” such as “latitude and longitude coordinates or a nearest street address.” Ivey, [0036].

131. Ivey’s parking records 610 also include parameters “such as hours of enforcement, rates, etc.” that enable the determination of “whether those parking spaces are paid for such that parking is authorized therein.” Ivey, [0032]-[0037];

132. In my opinion, Ivey’s parking records—including parameters such as hours of enforcement—are the claimed “time limits applicable to each of said plurality of parking spaces.”

133. Ivey’s parking system server 502 is detailed below:

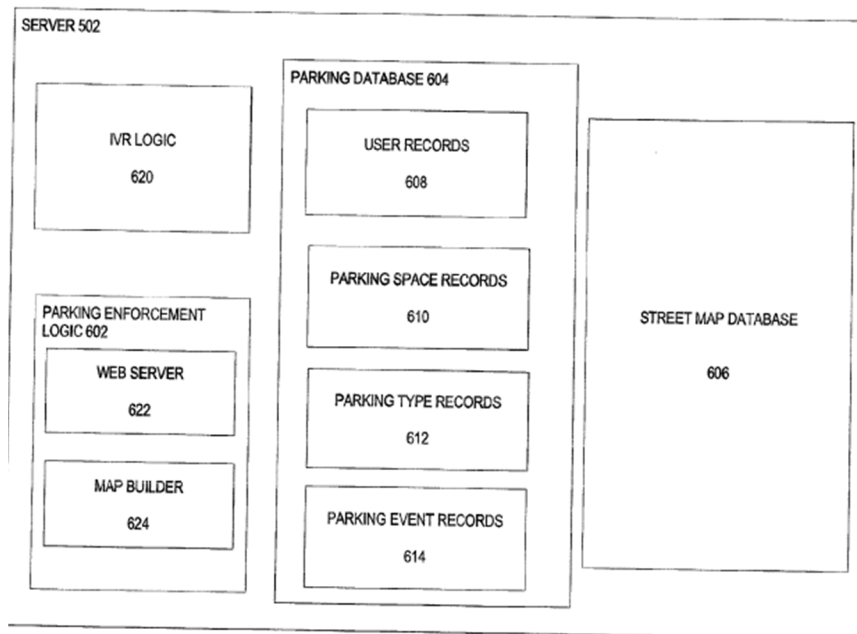


FIGURE 6

Ivey, Fig. 6.

c. [1.B]

“updating a database upon a computer of subscribers, said database including a list of parking spaces reserved by each subscriber, a list of parking spaces paid for by each subscriber, and a list of the expiration times for each paid for parking space of each subscriber;”

134. In my opinion, the combination of Ivey and Tillotson teach everything this claim limitation requires.

135. Ivey explains that its parking system server utilized a “server computer system.” Ivey, [0005].

136. As of the filing of the 421 Patent, a POSITA would have understood that a “server computer system” would include the claimed “database on a computer.”

137. Ivey’s explains that its parking system generates a parking payment status map that includes the user functionality of “panning, rotation, and refreshing of the parking payment status map.”

138. In my opinion, Ivey’s refreshing functionality teaches the claimed “updating a database upon a computer.”

139. Ivey explains that its parking database 604 includes “user records 608” and “parking event record 614.” Ivey, [0032]-[0036].

140. Ivey’s parking database 604 is detailed below:

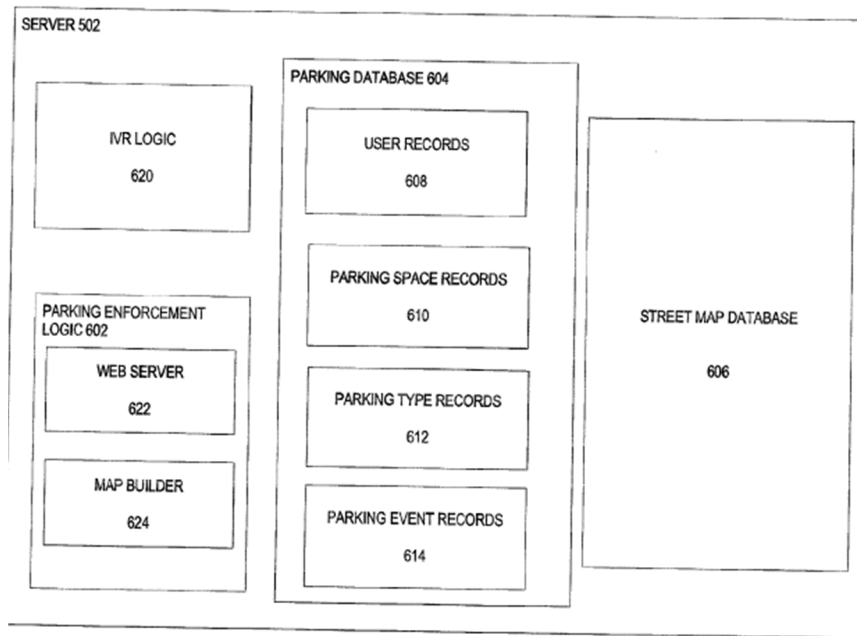


FIGURE 6

Ivey, Fig. 6.

141. Ivey's user records 608 represent "individual motorists who can pay for parking" and generally include information regarding "payments methods of each user." Ivey, [0032].

142. In my opinion, Ivey's user records are the claimed "database upon a computer of subscribers."

143. Ivey's parking event record 614 includes a "space identifier 702, a start time 704, a stop time 706, and a user identifier 708." Ivey, [0034].

144. More particularly, Ivey's "space identifier 702 uniquely identifies the parking space to which the ... parking event pertains within the parking spaces of parking space records 610." Ivey, [0034]-[0036].

145. Ivey's parking event record is below:

The diagram shows a rectangular box labeled "PARKING EVENT RECORD 614" at the top. Inside the box, there are four smaller rectangular boxes stacked vertically. The first box contains the text "SPACE ID 702", the second contains "START TIME 704", the third contains "STOP TIME 706", and the fourth contains "USER ID 708".

FIGURE 7

Ivey, Fig. 7.

146. In my opinion, Ivey's parking event record 614—including the space identifier 702, user identifier 708, and stop time 706—describe the claimed “a list of parking spaces paid for by each subscriber” and “a list of the expiration times for each paid for parking space of each subscriber.”

147. Next, in my opinion, a POSITA would have considered the remainder of what this limitation requires obvious in view of the teachings of Tillotson.

148. Tillotson relates to a method for determining the availability of a plurality of parking spaces, reserving one or more of such available parking spaces, and monthly subscriptions for parking spaces. Tillotson, Abstract; [0044], [0065].

149. Like Ivey’s parking system, Tillotson’s system includes parking space and reservation information. Tillotson, [0023]. Specifically, Tillotson discloses a “parking space information and reservation system (PSIRS).” *Id.*, [0023].

150. Tillotson’s PSIRS accepts “payment for access to the PSIRS to allow reservation of parking spaces..., or for access to the parking spaces... themselves.” Tillotson, [0065].

151. Tillotson further explains that its PSIRS includes information, such as, “duration of the parking reservation, and any other parameters, such as the identity or location of the reserved parking space.” Tillotson, [0059].

152. In my opinion, Tillotson’s PSIRS—including the duration of the parking reservation and identity or location of the reserved parking spaces—discloses the claimed “database ... of subscribers” and “said database including a list of parking spaces reserved by each subscriber.”

153. A POSITA would have found it obvious to use the above-described teachings to adapt Ivey’s system to enable a user of Ivey’s system to “reserve” a parking space. Tillotson teaches that users can reserve a parking space and select a desired time interval in which to park. Tillotson, [0053]. Adapting Ivey’s system

to provide this feature would simply require allowing a user of Ivey's system to designate a start time in the future. This would not be difficult to code. Such a system would provide added flexibility in allowing users to select parking spaces in advance of when the users actually intend to park in those spaces.

d. [1.C]

“calculating a location of said user, said calculating a location of said user adapted to utilize a location finding feature of said user's portable electronic device;”

154. In my opinion, Ivey, Matsumoto, and the combination of Ivey and Matsumoto teach everything this claim limitation requires.

155. In particular, Ivey explains that a user may get its “initial location” “by Global Positioning Satellite (GPS) receiver in hand-held computer 102” or “by wireless telephone location technology.” Ivey, [0043].

156. In my opinion, Ivey's determination of an initial location on its hand-held computer 102 by GPS or by wireless telephone location is the claimed “calculating a location of said user, said calculating a location of said user adapted to utilize a location finding feature of said user's portable electronic device.”

157. Next, in my opinion, a POSITA would have found Matsumoto to disclose this claim limitation.

158. Matsumoto relates to a parking lot guidance system. Matsumoto, [0006], [0061].

159. In particular, Matsumoto explains that its “car navigation device 10” includes a “position detector 11” feature that “calculates the current position based on the signal to specify the current position outputted from the position detector 11.” Matsumoto, [0042], [0046], [0050], [0051].

160. In my opinion, Matsumoto’s position detector 10 is the claimed “calculating a location of said user, said calculating a location of said user adapted to utilize a location finding feature of said user's portable electronic device.”

161. Finally, in my opinion, to the extent Ivey or Matsumoto do not individually teach this limitation, a POSITA would have considered the remainder of what this limitation requires obvious in view of the teachings of both Ivey and Matsumoto.

e. [1.D]

“determining upon a computer a location of one of said plurality of parking spaces by comparing the location of said user to said database of said plurality of parking spaces and selecting one of said plurality of parking spaces within eight to ten feet of the position of said user;”

162. In my opinion, Ivey, Matsumoto, and the combination of Ivey and Matsumoto teach everything this claim limitation requires.

163. In particular, Ivey explains that its parking payment status map’s “center is initialized to be the estimated location of the parking control officer as determined in step 902.” Ivey, [0045], Fig. 9.

164. Ivey's map includes "locations of nearby parking spaces, payment states of those parking spaces, and street map data." Ivey, [0046], Fig. 9.

165. The method that Ivey's parking payment status map is created is detailed below:

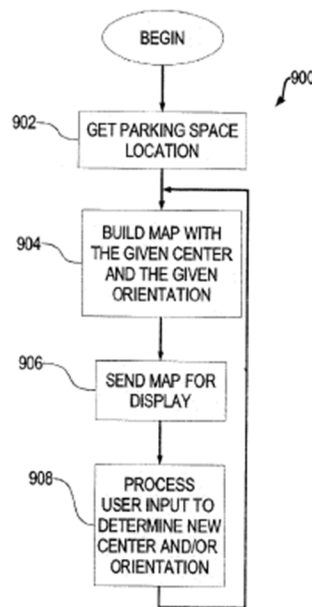


FIGURE 9

Ivey, Fig. 9.

166. A POSITA also would have found it obvious to use the above-described teachings to enable the selection of a parking space "within eight to ten feet of the position of said user." In order for an enforcement officer to perform enforcement duties, the officer will typically need to stand next to the vehicle in order to gather identifying information about the vehicle, write a parking ticket, and leave that ticket

on the vehicle. *See, e.g.*, Ivey, [0022] (describing an officer using the parking status map while “observing the parking meter stationed at each parking space in a conventional manner.”), [0059] (describing “writing a citation” when a violation is observed). Thus, the officer would benefit from having the display only show those parking spaces which are close enough to the officer that the officer could engage in enforcement actions. This would also reduce the amount of data shown on what is typically a small screen of a hand-held computer as described by Ivey.

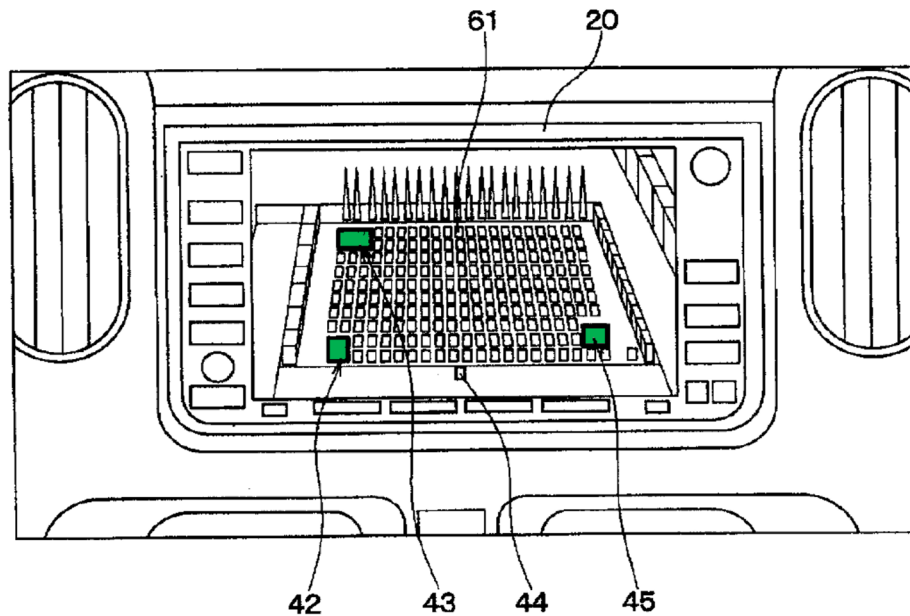
167. In my opinion, Ivey’s parking payment status map describes the claimed limitation.

168. Next, in my opinion, a POSITA would have found Matsumoto to disclose this particular claim limitation.

169. In particular, Matsumoto explains the generation of “a vacant space-highlighted live-action image displayed by the display device 20 of the car navigation device 10.” Matsumoto, [0061], Fig. 6.

170. The generated image enables the user to “immediately grasp the presence of a vacant parking space in areas 42, 43, and 45 by highlighting it.” Matsumoto, [0061], Fig. 6. Matsumoto’s generated image is detailed below:

【 図 6 】



EX1006, Fig. 6 (annotated).

171. A POSITA also would have understood that it was obvious that a “nearby” space was, or at least could be, within 8-10 feet of the user. In order for a motorist to find a parking space, the motorist will typically need to move towards the parking space. *See, e.g.*, Matsumoto, [0059] (describing motorist proceeding to an open parking space “based on the positional relationship between the current position 44 of vehicle 1” and the vacant parking spaces “areas 42 and 43”).

172. A POSITA would have understood that Matsumoto’s teachings would equally be used by a parking enforcement officer to identify and select parking spaces for enforcement purposes. The current position of the motorist’s GPS-based location and vacant parking spaces are combined to generate “vacant space-

highlighted live action” image. Matsumoto, [0060]. A POSITA would have understood that combining a location with the database records is comparing the user’s location with the vacant parking spaces “near the customer’s current location.” A POSITA would have further understood that the enforcement officer would (or at least could) use exactly the same steps to derive the same map of parking spaces near the enforcement officer. A POSITA would have readily appreciated the benefits of allowing the enforcement officer to have the same ability to identify nearby vacant or occupied spaces as the customer has. Since Matsumoto’s system already performs this comparison between customer data and the parking records, a POSITA would have readily appreciated that that same comparison would be trivial to implement for the parking officers as well. It would merely require providing the parking officer’s location, instead of the customer’s location, to Matsumoto’s system.

173. In my opinion, Matsumoto’s generated image is the claimed limitation.

174. Next, in my opinion, to the extent Ivey or Matsumoto do not individually teach this limitation, a POSITA would have considered the remainder of what this limitation requires obvious in view of the teachings of both, Ivey and Matsumoto.

f. [1.E]

“comparing upon a computer the location of one of said plurality of parking spaces with said database of subscribers further comprising comparing upon a computer the location of one of said plurality of parking spaces against said list of parking spaces paid for by said subscribers for a match between said location and said list of parking spaces paid for by said subscribers;”

175. In my opinion, Ivey includes the claimed limitation.

176. According to Ivey, the system discloses “determining whether a specific parking space is paid for and occupation thereof is authorized.” Ivey, [0039].

177. In particular, Ivey teaches that a “parked flag 808 is set each time payment for parking in the space is initiated and is cleared each time payment for parking in the space is terminated.” Ivey, [0036]-[0039].

178. Ivey also teaches that “the payment state of respective parking spaces” may be determined “by reference to parking event records 614.” Ivey, [0040]. For example, if parking enforcement logic 602 finds a particular parking space corresponds to a parking event record which has a null stop time 706, the parking space is determined to be in a paid state. *Id.* If no such parking event record exists in parking event records 614, parking enforcement logic 602 determines that the parking space is in an unpaid state. *Id.*

179. In my opinion, Ivey’s determination whether a specific parking space is paid for and occupation thereof is authorized meets the claimed limitation.

g. [1.F]

“upon detecting a match between said location and said list of parking spaces paid for by said subscribers, comparing the matched parking spaces to said list of expiration times and upon detecting the matched parking spaces exceeding an expiration time displaying upon said user’s screen an UNPAID payment indicia upon an image of the matched parking space, wherein the user may execute enforcement measures upon any vehicle in said matched parking space showing said UNPAID indicia;”

180. In my opinion, Ivey includes the claimed limitation.

181. As discussed for limitation [1.E] above, Ivey explains that the parking payment status map 100 includes “data representing the current paid or unpaid status of each parking space.” Ivey, [0025].

182. Ivey also teaches that “the payment state of respective parking spaces” may be determined “by reference to parking event records 614.” Ivey, [0040]. For example, if parking enforcement logic 602 finds a particular parking space corresponds to a parking event record which has a null stop time 706, the parking space is determined to be in a paid state. *Id.* If no such parking event record exists in parking event records 614, parking enforcement logic 602 determines that the parking space is in an unpaid state. *Id.* This is comparing the parking space to the list of expiration times as provided by the parking event records.

183. Since the parking status map displays both the parking meters and the data representing the current paid or unpaid status, a POSITA would have

appreciated that Ivey compares the parking space locations to the expiration times in order to determine whether the parking space is in a paid or unpaid state.

184. In particular, Ivey identifies potential representations of the payment status, such as “paid locations are represented in green and unpaid locations are represented in red” and are displayed on a “hand-held computer 102.” Ivey, [0006], [0025], [0043], Fig. 3 (annotated below).

185. Ivey’s parking payment status map 100 with these representations is detailed below:

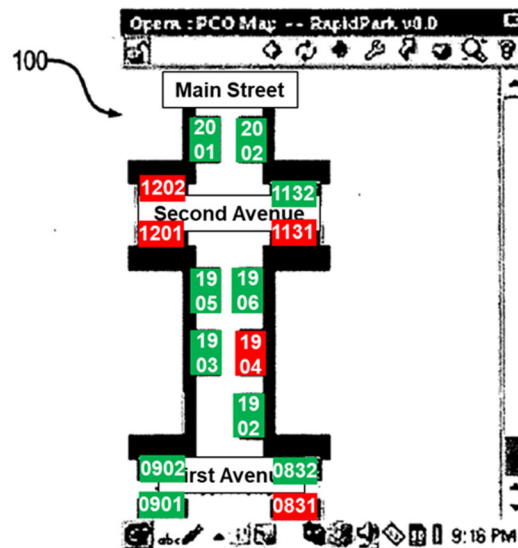


FIGURE 3

Ivey, Fig. 3.

186. Ivey also explains that other display characteristics can be varied to represent the different states of the various parking locations. Ivey, [0006].

187. Further, Ivey details that the parking payment status map is sent to a parking control officer's device for enforcement, specifically, a "hand-held computer 102" for "display" (*i.e.*, the claimed user's screen). Ivey, [0020]; *see also*, Fig. 3.

188. In my opinion, Ivey's parking payment status map is this claimed limitation.

h. [1.G]

"wherein said method transforms upon a computer location data of said plurality of parking spaces and payment status data of said plurality of parking spaces into indicia of UNPAID parking spaces;"

189. To the extent this language is even limiting, Ivey discloses this limitation.

190. As discussed above for limitations [1.PRE]–[1.F], Ivey explains that the parking payment status map 100 includes "locations of nearby parking spaces, payment states of those parking spaces, and street map data." Ivey, [0046], Fig. 9. This map further includes "data representing the current paid or unpaid status of each parking space," which, in my opinion, is the claimed transformation of location data into indicia of the payment status.

191. Ivey also describes indicia of payment status, such as, “paid locations are represented in green and unpaid locations are represented in red.” Ivey, [0006], [0025], [0043].

192. Ivey also discloses that other display characteristics can be varied to represent the different states of the various parking locations. Ivey, [0006].

193. In my opinion, Ivey’s parking payment status map is this claimed limitation.

i. [1.H]

“said comparing the matched parking space to said list of expiration times and upon detecting the matched parking space exceeding an expiration time and said method places said indicia of UNPAID on an image of a matched parking space upon the real time camera view on the screen of a user’s device for enforcement.”

194. In my opinion, the combination of Ivey and Matsumoto teach everything this claim limitation requires.

195. Similar to above, Ivey discloses the overlay of a parking space’s payment status on an image of the matching parking space on the screen of a user’s device by describing “data representing the current paid or unpaid status of each parking space,” such as “paid locations are represented in green and unpaid locations are represented in red” displayed on a “hand-held computer 102.” Ivey, [0006], [0025], [0043], Fig. 3 (annotated below).

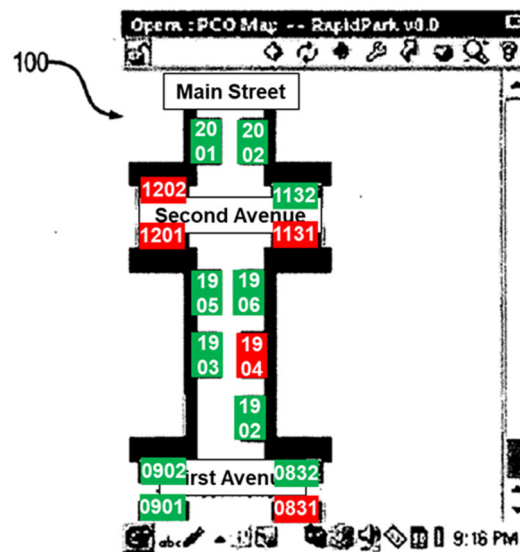


FIGURE 3

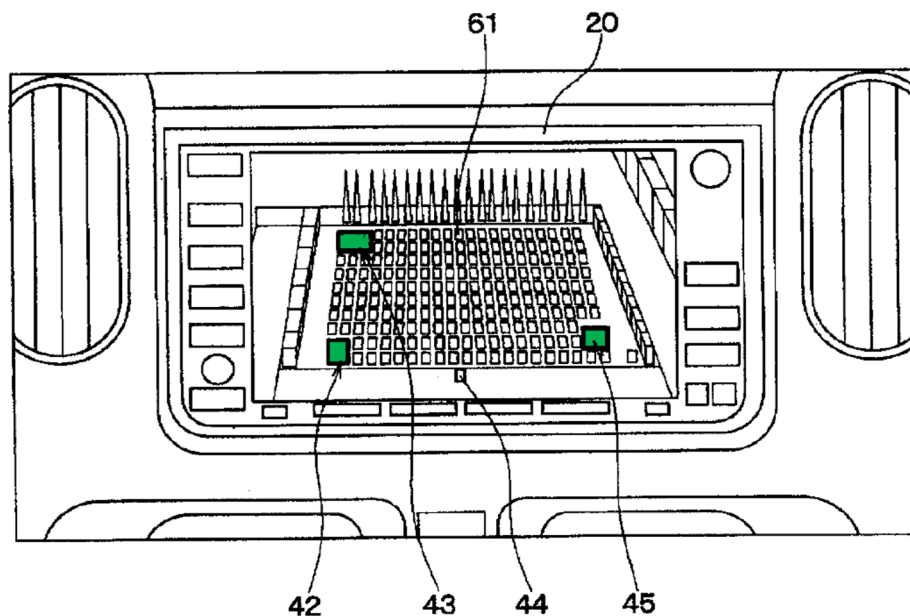
196. As I noted above, Ivey teaches using a map that depicts a street and parking spaces. Ivey, [0022], [0033], Abstract. A POSITA would have understood that Ivey's street map was supposed to be a close depiction of the real street, as this would simplify the parking officer's efforts to compare the street map on his display with the real street that the parking officer is progressing along, as the officer seeks to identify cars that require enforcement actions. *Id.*, [0051].

197. Thus, a POSITA would have been motivated to implement a system that could display a high-quality depiction of the real street. Such high-quality depictions of real streets were well-known in the prior art of parking control and enforcement systems. Matsumoto, [0060]; Haynes, 12:62-13:8, 13:32-43.

198. Next, in my opinion, a POSITA would have considered the remainder of what this limitation requires obvious in view of the teachings of Matsumoto.

199. Matsumoto discloses “generating a vacant space-highlighted live-action image” (*i.e.*, a camera view) to be displayed by the car navigation device 20 (*i.e.*, the screen of the user’s device). Matsumoto, [0060], [0061]; *see also* Fig. 6.

【 図 6 】



EX1006, Fig. 6.

200. Matsumoto further discloses that “the map display program overlaps the vehicle current position mark based on the current position information inputted from position detector 11, the map data read from internal memory controller 16, ... and displays them on the display surface of display device 20.” Matsumoto, [0053].

201. Matsumoto also discloses superimposing graphics and text display to provide the user information on the live-action image. Matsumoto, [0065].

202. A POSITA would have found it obvious to superimpose the parking space's payment status information from Ivey on a live-action image as taught by Matsumoto.

203. In my opinion, the combination of Ivey's parking payment status map and Matsumoto's live-action image disclose the claimed limitation.

204. In my opinion, a POSITA would have found it obvious to apply Matsumoto's teachings of a live-action image of a parking lot, enhanced with data about the parking spaces, to Ivey's system for displaying the payment status of each parking meter nearby an enforcement officer. As I note above, Ivey teaches that its parking map corresponds to a real street. A POSITA would have understood from Matsumoto the value of using an image of the actual street, to better allow the enforcement officer of Ivey to compare the parking map with the real street, as taught by Ivey. Ivey, [0022]. By looking at an image of the actual street, the officer could more easily and rapidly identify the real locations that corresponded to the virtual locations on his display. He could thus more easily and rapidly identify those parking spaces for which no fee was paid, and compare those with the actual spaces to see if a car was improperly parked in the space.

205. A POSITA would have further understood from Matsumoto that this image of the street is a live-action image (*i.e.*, “real-time”). Again, real-time updates would allow the officer to get a more accurate view of the parking meters and the street, to more easily identify parking meters for which no fee had been paid, as well as to identify whether a car was currently parked in such a space, as taught by Ivey. Ivey, [0059].

2. Claim 2

206. Claim 2 depends on claim 1 and further requires:

“opening an account for each of said subscribers wherein said account permits each of said subscribers to reserve at least one of said plurality of parking spaces and permits each of said subscribers to pay for at least one of said plurality of parking spaces utilizing means of electronic payment.”

207. As explained above, Ivey, Matsumoto, Tillotson, and the knowledge of a POSITA teach everything claim 1 requires.

208. In my opinion, the combination of Ivey and Tillotson teach the additional limitation of claim 2.

209. Ivey discloses user records 608 for individual motorists, which include “payment methods of each user (*e.g.*, prepaid accounts with account balance information).” Ivey, [0032]. A POSITA would have understood that such accounts must be “opened” in order for the motorists to use these accounts to reserve and pay for parking.

210. Ivey also teaches the receipt and service of requests from motorists to initiate or terminate payment for a particular parking space. Ivey, [0031].

211. In my opinion, Ivey's user records are the claimed user accounts and payment for parking spaces.

212. Next, in my opinion, a POSITA would have considered the remainder of what this limitation requires obvious in view of the teachings of Tillotson.

213. As discussed above, Tillotson discloses a parking space information and reservation system (PSIRS), which includes an operations center, which in turn includes a user account database. Tillotson, [0023]. A POSITA would have understood that each user account in this database is an account for a subscriber as claimed, and that such accounts must be opened in order for the user to use them.

214. Tillotson's PSIRS discloses reserving parking spaces by describing "reservation data" that "is stored in the parking data base." Tillotson, [0029]. Tillotson's system discloses a system that accepts "payment for access to the PSIRS to allow reservation of parking spaces..., or for access to the parking spaces... themselves." *Id.*, [0065].

215. Additionally, Tillotson discloses several methods of electronic payment for the parking spaces including "a flat monthly subscription rate, a fee-per-service with monthly billing, or a payment at time of use via online credit card data or services like PAYPAL." Tillotson, [0065].

216. Tillotson’s disclosure of credit card payments teaches the claimed “means of electronic payment” limitation, because the 421 Patent defines a “means of electronic payment” to include credit cards. 421 Patent, 16:20-24 (means of electronic payment defined as “ACH transfer, EFT debit, credit card, wire transfer, cell phone account and the like”).

217. Additionally, the 421 Patent admits that the opening and use of parking subscriber accounts has long been understood and practiced for decades. 421 Patent, 3:19-26 (“The publication to Chatterjee, No. 2004/0068433 illustrates a parking system with maps of parking spaces that allows subscribers to pay for parking by wireless or web communications.”).

218. In my opinion, the combination of Ivey’s user database and Tillotson’s PSIRS discloses the claimed limitation.

3. Claim 3

219. Claim 3 depends on claim 1 and further requires:

“said indicia of UNPAID overlaying upon said user’s screen one of the word UNPAID, a colored logo, a circle with a bar, and a letter X.”

220. As explained above, Ivey in view of Matsumoto, Tillotson, and the knowledge of a POSITA teach everything Claim 1 requires.

221. In my opinion, Ivey, Matsumoto, or the combination of Ivey and Matsumoto teach the additional limitation of claim 3.

222. As discussed above, Ivey discloses displaying the payment status of parking spaces using colored logos, specifically, “paid locations are represented in green and unpaid locations are represented in red.” Ivey, [0006], Fig. 3 (annotated below); *see also id.*, Fig. 11.

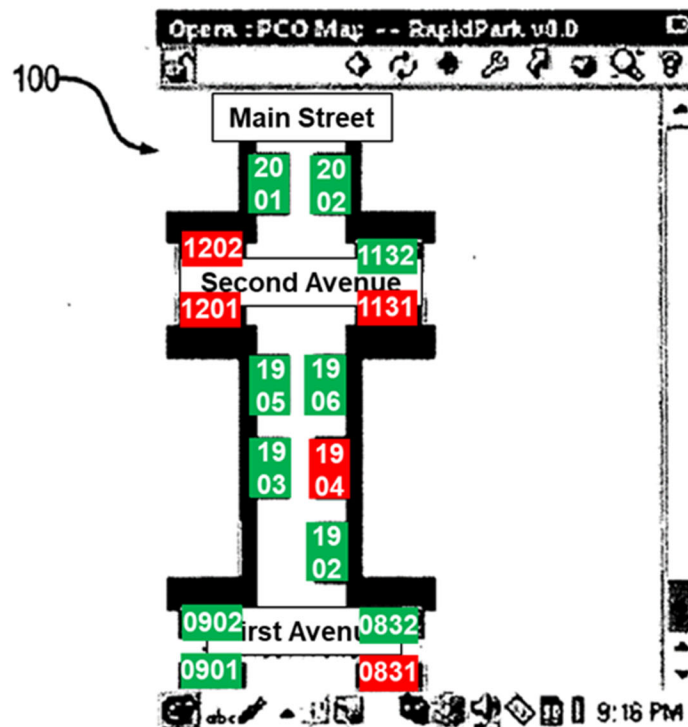


FIGURE 3

Id., Fig. 3

223. Ivey also discloses the use of “other display characteristics” that “can be varied to represent the different states of the various parking locations.” Ivey, [0006].

224. A POSITA would have understood that the use of colored highlighting to indicate non-payment status satisfies the 421 Patent's teaching of using a "colored logo." The 421 Patent does not provide any definition or indeed any meaningful discussion of what a "colored logo" would be. 421 Patent, 15:57-62. Since the apparent function of this colored logo is simply to provide an indication of PAID or UNPAID status, a POSITA would have understood that this could be any type of color-based symbol that the user would understand to be an indicator of PAID or UNPAID status. This would have included Ivey's use of colored highlighting to indicate when fees had been paid or not paid.

225. Additionally, it would have been obvious to a POSITA in view of Ivey's teachings of the use of "other display characteristics" that "can be varied to represent the different states of the various parking locations" (Ivey, [0006]) that such other types of indicators could include a letter "X" or a circle with a bar through it. Both of these indicators were very well known as indicators for negative status, such as something that is not permitted or allowed, even in the common parking vernacular, and naturally suggest an exception such as an unpaid space. Indeed, the universally-recognized symbol for "no parking" is a circle with a bar through it. *See, e.g.,* EX1020, Convention on Road Signs and Signals, Vienna, Nov. 8, 1968, Annex 6, Section A.1 (describing a sign for indicating where parking is prohibited, which is "a circular sign with a red border and a red transverse bar.").

226. In my opinion, Ivey’s representations of parking space payment status discloses this limitation.

227. Similarly, Matsumoto discloses superimposing “a bold line surrounding the vacant parking space” on the image displayed. Matsumoto, [0062].

228. Matsumoto teaches superimposing graphics and text over the live-action image to identify “restroom 51, restaurant 52, vending machine 53, covered road 54 as facilities in the vicinity of parking lot 4, exit 55, large vehicle designated slot 56, small vehicle designated slot 57 as information on the vicinity (*i.e.*, around and within parking lot 4) of parking lot 4.” Matsumoto, [0065], Fig. 8.

229. As I discuss above, a POSITA would have known to include “the word UNPAID, a colored logo, a circle with a bar, and a letter X” or other specific indicia to indicate the payment status of a parking space.

230. In my opinion, Matsumoto’s superimposing of graphics and text display discloses this limitation.

231. Finally, in my opinion, to the extent Ivey or Matsumoto do not individually teach this limitation, a POSITA would have considered the remainder of what this limitation requires obvious in view of the teachings of both Ivey and Matsumoto. Specifically, the combination of Ivey’s indicia of payment (displaying

the payment status of parking spaces using colored logos) and Matsumoto's superimposition of graphics and text are complementary to one another, making them good targets for combination.

4. Claim 5

232. Claim 5 is an independent claim, however, it is very similar to Claim 1.

a. [5.PRE]

“A method for representing the parking status of a plurality of parking spaces to a screen of a user's portable electronic device upon a real time camera view, any of said at least one parking space being one of PAID for current payment and UNPAID upon exhaustion of payment, any of a plurality of subscribers utilizing said method to reserve at least one of the plurality of parking spaces and then to pay for at least one of the plurality of parking spaces, the method comprising:”

233. If limiting, this preamble is taught by Ivey, Matsumoto. Tillotson for the same reasons explained for [1.PRE]. *See supra* Section XII.A.1.a.

b. [5.A]

“assembling a database of said plurality of parking spaces, said database including geographic locations of said plurality of parking spaces and time limits applicable to each of said plurality of parking spaces and storing said parking space database upon a computer server;”

234. As explained above, Ivey teaches everything claim [1.A] requires.

235. The only differences between claim limitations [1.A] and [5.A] is the deletion of the “upon a computer” clause and the additional recitation of “storing said parking space database upon a computer server.”

236. The deletion of “upon a computer” does not change my analysis of the prior art or how it covers the claim. Ivey teaches assembling the database on a computer, and a POSITA would have understood that this teaching also teaches the more generic “assembling a database” limitation set forth here. Thus, in my opinion, the “assembling” limitation is taught by Ivey for the same reasons explained for limitation [1.A]. *See supra* Section XII.A.1.b.

237. Ivey further teaches the “storing” limitation. Ivey teaches that its “server 502 also includes a parking database 604”. This database includes “user records..., parking space records..., parking type records... and parking event records.” Ivey, [0032].

238. Additionally, in my opinion Tillotson teaches the additional limitation of this claim.

239. Tillotson discloses the “storing” requirement. Tillotson, [0023], [0065]. Tillotson’s PSIRS comprises an operations center 202, which is the claimed computer server. *Id.*, [0023].

240. Tillotson’s PSIRS also includes a parking database 206, which is the claimed parking space database. Tillotson, [0023].

c. [5.B]

“updating a database of subscribers, said database including a list of parking spaces reserved by each subscriber, a list of parking spaces paid for by each subscriber, a list of the expiration times

for each paid for parking space of each subscriber, and storing said subscriber database upon a computer server, and further including enrolling each of said subscribers into a membership plan for parking payment;”

241. As explained above, the combination of Ivey and Tillotson teaches everything [1.B] requires. *See supra* Section XII.A.1.c.

242. The only material difference between claim limitation [1.B] and [5.B] is the additional recitation of “storing said subscriber database upon a computer server, and further including enrolling each of said subscribers into a membership plan for parking payment.”

243. Ivey teaches this “storing” limitation. Ivey teaches that its “server 502 also includes a parking database 604.” This database includes “user records..., parking space records..., parking type records... and parking event records.” Ivey, [0032]. The user records are the claimed “subscriber database” that is stored on a server.

244. Additionally, Tillotson discloses the “storing” and “enrolling” limitations. Tillotson, [0023], [0065].

245. Tillotson discloses a parking space information and reservation system (PSIRS), which comprises an operations center 202 (*i.e.*, a computer server as claimed), which includes a user account database 208 (*i.e.*, a subscriber database as claimed). Tillotson, [0023].

246. The PSIRS includes users 219 that can include subscribers who have paid a periodic charge for access to the PSIRS 200 (*i.e.*, enrolling subscribers in membership plans as claimed). Tillotson, [0023].

247. Such users can be added to the system by system administrators (*i.e.*, enrolled). Tillotson, [0026].

248. A POSITA would have understood that at least the periodic charge and the free access options are membership plans as claimed.

249. Tillotson also discloses that “individual users 219 may pay a flat monthly subscription rate, a fee-per-service with monthly billing, or a payment at time of use via online credit card data or services like PAYPAL” (*i.e.*, enrolling subscribers in membership plans as claimed). Tillotson, [0065].

250. A POSITA would have understood that at least the flat monthly subscription rate is a membership plan as claimed.

d. [5.C]

“calculating a location of said user, said calculating a location of said user adapted to utilize a location finding feature of said user's portable electronic device;”

251. This limitation is taught by Ivey for the same reasons explained for limitation [1.C]. *See supra* Section XII.A.1.d.

e. [5.D]

“determining upon a computer server a location of one of said plurality of parking spaces by comparing the location of said user

to said database of said plurality of parking spaces and selecting one of said plurality of parking spaces within eight to ten feet of the position of said user;”

252. As explained above, the combination of Ivey and Matsumoto teach everything [1.D] requires. *See supra* Section XII.A.1.e.

253. The only difference between claim limitations [1.D] and [5.D] is the addition of “server.”

254. The addition of this language does not change my view of the prior art or how it reads on the claim. This is because Ivey’s logic that performs this function resides on a server. Ivey, [0030]-[0031], Fig. 6. (server contains “parking enforcement logic 602” which performs the functions recited above).

f. [5.E]

“comparing upon a computer server the location of one of said plurality of parking spaces with said database of subscribers further comprising comparing upon a computer the location of one of said plurality of parking spaces against said list of parking spaces paid for by said subscribers for a match between said location and said list of parking spaces paid for by said subscribers”

255. As explained above, Ivey teaches everything [1.E] requires. *See supra* Section XII.A.1.f.

256. The only difference between claim limitations [1.E] and [5.E] is the addition of “server.”

257. As I discuss above, the addition of this language does not change my view of the prior art or how it reads on the claim.

g. [5.F]

“wherein upon detecting a match between said location and said list of parking spaces paid for by said subscriber, comparing the matched parking space to said list of expiration times and further upon detecting the matched parking spaces exceeding an expiration time displaying upon said user’s screen an UNPAID indicia upon an image of the matched parking space, wherein the user may execute enforcement measures upon any vehicle in said matched parking space showing said UNPAID indicia;”

258. As explained above, Ivey teaches everything [1.F] requires. *See supra* Section XII.A.1.g.

259. The only differences between claim limitations [1.F] and [5.F] are minor (adding “further,” replacing “subscribers” and “spaces” with “subscriber” and “space,” and deleting “payment”).

260. These differences do not change my view of the art or its relevance to the claim. The term “further” adds nothing of substance to a POSITA. Changing the plural “subscribers” and “spaces” to the singular “subscriber” and “space” also makes no difference to the analysis. Ivey discloses users paying for parking spaces, without any restrictions on the number of such spaces a subscriber could reserve or pay for. Thus Ivey’s teachings would be seen by a POSITA as equally applicable to any number of subscribers and spaces. The term “payment” would be seen by a

POSITA as largely redundant of the term “UNPAID.” That is, an “UNPAID” indicia is necessarily an indicia of some kind of “payment” status.

h. [5.G]

“wherein said method transforms upon a computer location data of said plurality of parking spaces and payment status data of said plurality of parking spaces into indicia of UNPAID parking spaces;”

261. This limitation is taught by Ivey for the same reasons explained for limitation [1.G]. *See supra* Section XII.A.1.h.

i. [5.H]

“said comparing the matched parking space to said list of expiration times and upon detecting the matched parking space exceeding an expiration time and said method places said indicia of UNPAID on an image of a matched parking space upon the real time camera view on the screen of a user's device for enforcement.”

262. This limitation is taught by Ivey in view of Matsumoto for the same reasons explained for limitation [1.H]. *See supra* Section XII.A.1.i.

5. Claim 6

263. Claim 6 depends on Claim 5 and further requires:

“wherein said indicia of UNPAID includes one of the word UNPAID, a colored logo, a circle with a bar, and a letter X.”

264. As explained above, Ivey, Matsumoto, Tillotson, and the knowledge of a POSITA discloses all limitations of Claim 5.

265. In my opinion, Ivey, Matsumoto, or the combination of Ivey and Matsumoto teach the additional limitation of claim 6 for the same reasons as I discuss above for claim 3.

B. Motivation to Combine Ivey, Matsumoto, and Tillotson and Expectation of Success

266. A POSITA would have considered it obvious and would have been motivated to combine the teachings of Ivey, Matsumoto, and Tillotson.

267. Ivey, Matsumoto, and Tillotson are from the same field (parking space management) and address the same general concept (facilitating parking by providing information regarding the availability of parking spaces).

268. Ivey relates to the local enforcement of remotely managed parking systems. Ivey, Abstract.

269. Ivey's system is shown in the below annotated figures:

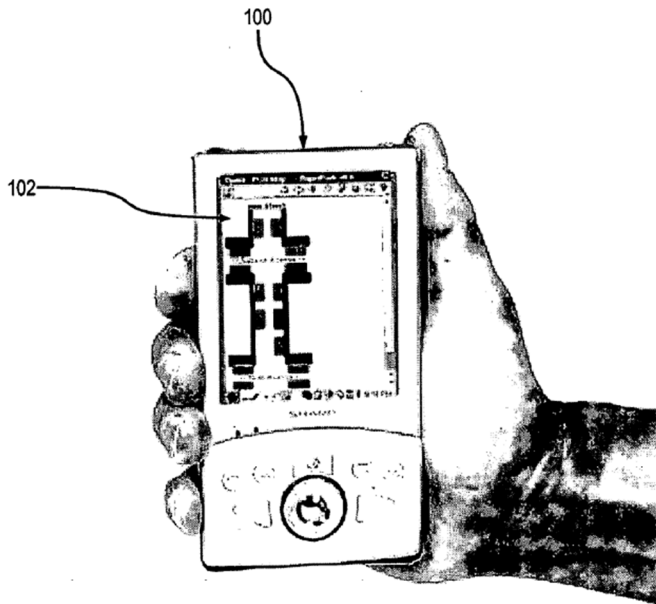


FIGURE 1

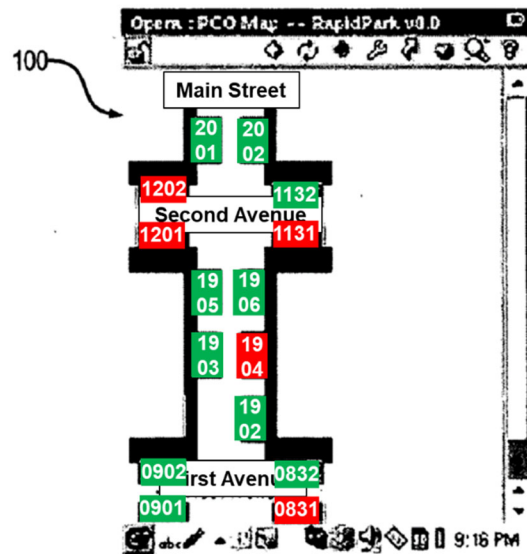


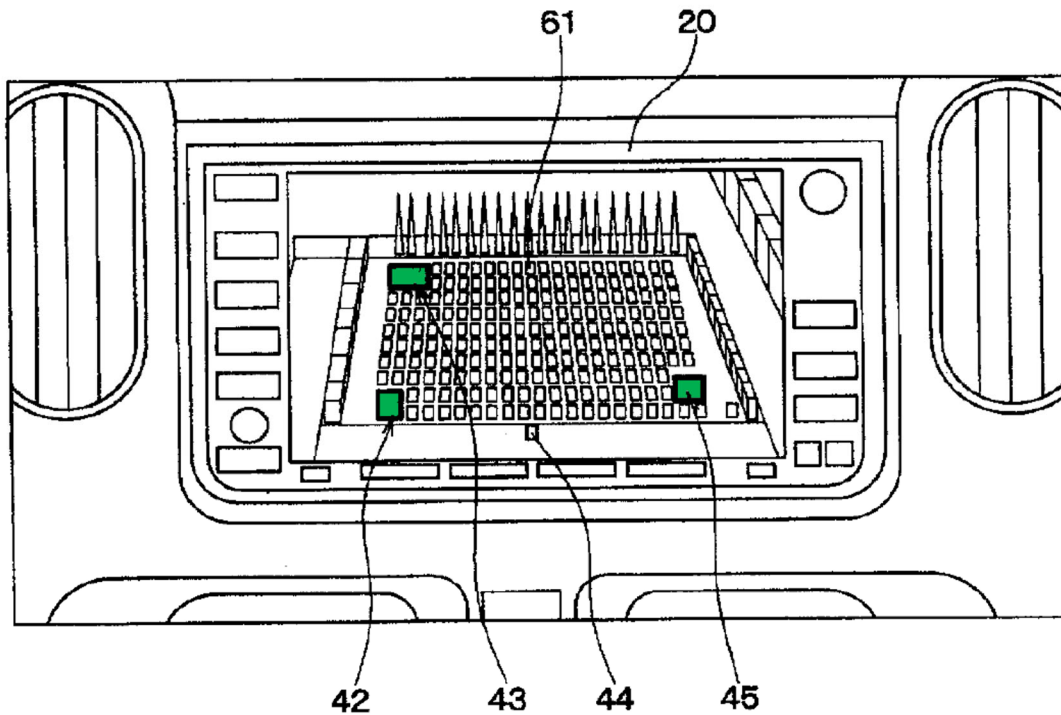
FIGURE 3

Ivey, Figs. 1, 3 (annotated).

270. Matsumoto relates to a parking lot guidance system. Matsumoto, [0006], [0061].

271. Matsumoto's generated image is shown in the below annotated figure.

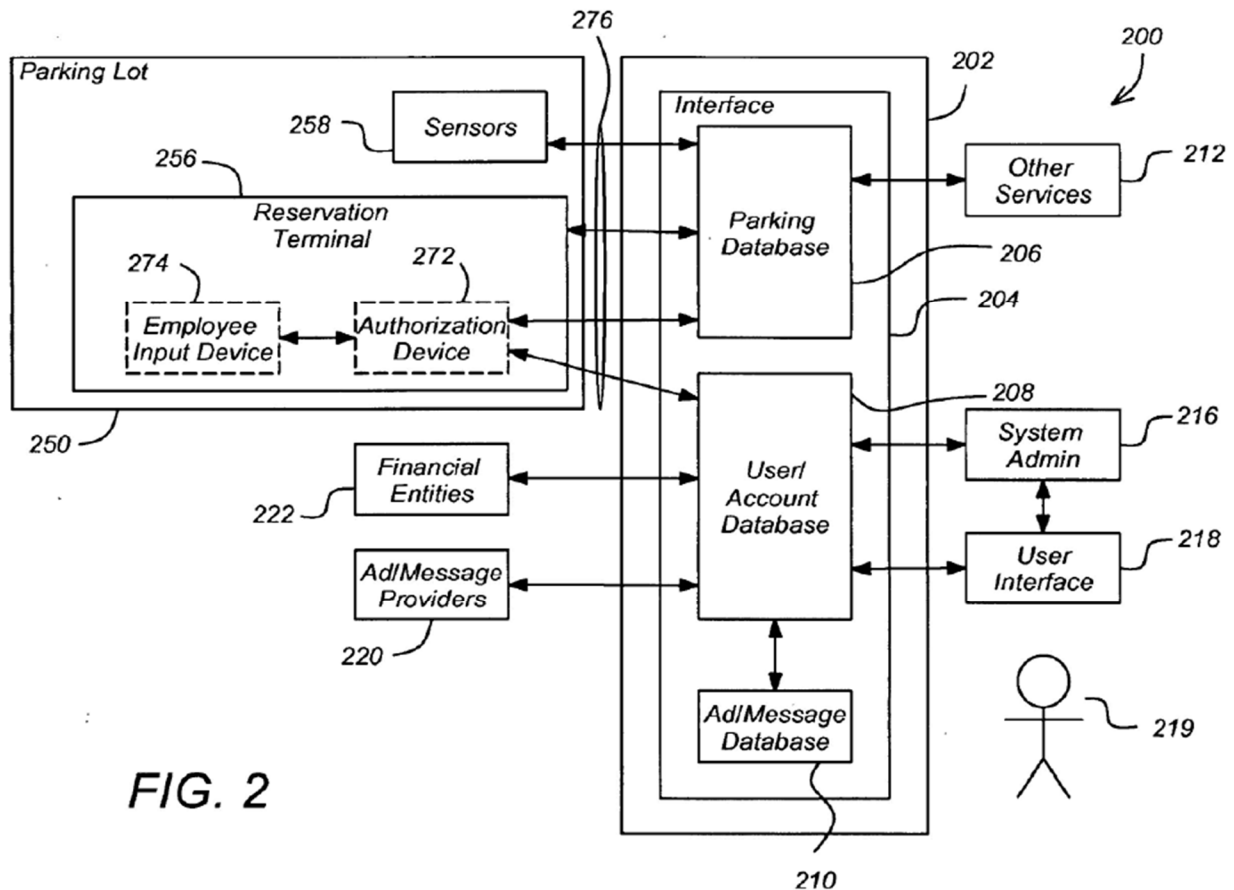
【 図 6 】



EX1006, Fig. 6.

272. Tillotson relates to a method for determining the availability of a plurality of parking spaces, reserving one or more of such available parking spaces, and monthly subscriptions for parking spaces. Tillotson, Abstract, [0044], [0065].

273. Tillotson relates to parking space information and reservation system (PSIRS), which is depicted below. Tillotson, [0023].



Id., Fig. 2.

274. Ivey, Matsumoto, and Tillotson also teach many of the same specific concepts.

275. Ivey explains that it relates to “the field of computer-implemented parking payment status displays, and more specifically to a particularly efficient graphical representation and intuitive user interface by which a parking control officer can verify remotely administered payment of parking fees.” Ivey, [0001].

276. Matsumoto explains that it relates to “a guidance system which enables a user to smoothly move to a vacant space in a parking lot, on the basis of the user’s own selection.” Matsumoto, Abstract.

277. Tillotson explains that it relates to “monitoring and reserving parking spaces.” Tillotson, [0002].

278. A POSITA would therefore have appreciated that Ivey’s, Matsumoto’s, and Tillotson’s teachings were well-known and were complementary to one another, making them good targets for combination.

279. Second, with respect to the displaying of parking space payment status information upon a real-time camera view, a POSITA would have recognized that Matsumoto’s teaching to add that information in a real-time view would be advantageous to Ivey because the manner of displaying that information was known to facilitate a parking enforcement officer’s verification of payment status of multiple parking spaces simultaneously.

280. This was an issue that would have been very familiar to a POSITA during the relevant time period and was an easily-improved shortcoming of Ivey’s approach.

281. A POSITA would have readily appreciated that adapting Ivey in view of Matsumoto’s teaching to include payment status information upon a real-time camera view would more efficiently streamline parking enforcement. For

example, with the Matsumoto generated image, the parking officer would have a “real time camera view” to identify, move to, and issue citations for unpaid and/or delinquent parking spaces more efficiently. A parking enforcement officer would be able to quickly assess the number of potential parking citations on a street block without walking the entire block and individually checking each parking meter.

282. Third, with respect to reservation and subscription systems, a POSITA would have recognized that adapting Ivey in view of Tillotson’s teachings would have been advantageous to both Ivey and Matsumoto and would make the parking management system more efficient and easier to use—a result that would have been highly desirable to a POSITA during the relevant time period, particularly in settings with high usage or limited resources. Specifically, a POSITA would have been motivated to incorporate Tillotson’s reservation and subscription systems to simplify the payment process for reservation and subscription fees. The combination would have predictably resulted in a motorist being able to reserve and/or prepay for a parking space, thereby, simplifying the payment process and reducing the time required for the motorist (*i.e.*, instead of having to identify a vacant parking space, park, and locate the relevant manner to pay for the parking space). Additionally, the incorporation of a reservation and subscription system would enable the repeated and quick acceptance of payment for the parking management operator and parking enforcement officer as well.

283. A POSITA would have had a high expectation of success in adapting Ivey in view of Matsumoto's teachings to include a real-time camera view and Tillotson's teachings of reservation and subscription systems.

284. As discussed above, Ivey, Matsumoto, and Tillotson are from the same field and teach many similar concepts, so a POSITA would have understood that their disclosures were likely complementary.

285. Moreover, Ivey already displayed payment status indicia on a portable electronic device and, thus this same information would be suitable to be displayed upon a real-time camera view as taught by Matsumoto. A POSITA schooled in AR would have been familiar with the techniques and available frameworks, such as mentioned in Sec. B and C to appropriately render the information atop the live image.

286. Similarly, Ivey already accepted payment to reserve parking spaces, so only minor modifications to it would be involved in adapting Ivey in view of Tillotson's PSIRS teachings.

287. Furthermore, including these features in a parking management system was conventional and well-known at the time of Ivey, Matsumoto, and Tillotson.

288. These parking management systems are all largely software systems, written in various languages.

289. A POSITA would have been well-capable of writing code in any particular language desired, to implement the features and functionalities disclosed in Ivey, Matsumoto, and Tillotson.

290. There would have been no particular barriers to writing such code for the additional features described by the teachings of Ivey, Matsumoto, and Tillotson.

291. Thus, a POSITA would have expected to be successful in adding these features.

XIII. GROUND 2: IVEY IN VIEW OF MATSUMOTO, TILLOTSON, SLEMMER, AND THE KNOWLEDGE OF A POSITA RENDERS OBVIOUS CLAIMS 4, 7

292. In my opinion, moreover, when viewed and considered in light of the knowledge possessed by a POSITA, the combination of Ivey, Matsumoto, Tillotson, and Slemmer disclose all the limitations of claims 4 and 7 of the 421 Patent and render them obvious.

293. As I discuss in detail above, Ivey in view of Matsumoto and Tillotson teach all limitations of claims 1 and 5. It is my opinion that Slemmer teaches the additional limitation recited in claims 4 and 7 that the indicia include an audible recitation.

A. Claim-by-Claim Analysis

1. Claims 4 and 7

294. Claim 4 depends on claim 1 and further requires:

“said indicia of UNPAID including an audible recitation.”

295. Claim 7 depends on claim 5 and further requires:

“said indicia of UNPAID includes an audible signal transmitted from a computer server to the user's portable electronic device.”

296. As explained above, Ivey, Matsumoto, Tillotson, and the knowledge of a POSITA teach everything Claims 1 and 5 require, including the “indicia of UNPAID” being provided from Ivey’s computer server to the screen of the user’s portable device. These UNPAID indicia are various forms of digital data displayed on a screen (*e.g.*, red and green highlighting on a parking space) (Ivey, [0022]), rather than an audible recitation or audible signal.

297. In my opinion, Slemmer teaches the additional limitation of claims 4 and 7.

298. As discussed above, Ivey includes “indicia of UNPAID” being provided from Ivey’s server to the screen of the user’s portable device.

299. These UNPAID indicia are various forms of digital data displayed on a screen (*e.g.*, “paid locations are represented in green and unpaid locations are represented in red”) rather than an audible recitation or audible signal. *See* Ivey, [0006].

300. Slemmer discloses the concept of converting digital data about a parking space into an audible recitation of parking space information, and transmitting that data from a server to the user's portable device.

301. Specifically, Slemmer discloses that "available space location data can be audibly provided using an automated voice translation system that converts digital space data to a verbal message that can be transmitted over predetermined broadcast systems." Slemmer, [0040].

302. The audio/verbal message can direct "the driver of a vehicle to a lot and/or open space as they arrive in the vicinity of the parking lot." Slemmer, [0040].

303. A POSITA would have known to use Slemmer's disclosure of converting digital data about a parking space to a verbal message to convert the digital UNPAID indicia of Ivey into an audible recitation of that same indicia.

304. It would have been obvious to a POSITA to use Slemmer's disclosure of converting digital data about a parking space to a verbal message to convert the digital UNPAID indicia of Ivey into an audible recitation of that same indicia. Ivey teaches a POSITA the benefits of providing the UNPAID indicia to an enforcement officer in an easily understood format. Ivey, [0022]. A POSITA would have understood, however, that in some circumstances, such as when an enforcement officer is driving along a street as disclosed in Ward, the officer's visual attention

may need to be on the street in front of the officer's car, rather than on the display on the hand-held computer. In such circumstances, a POSITA would have appreciated that Slemmer's teachings of converting digital data (such as video data) into audible recitations or indications, would beneficially allow the enforcement officer to be alerted to the presence of a parking space with the UNPAID indicator, without diverting the officer's visual attention from the roadway.

B. Motivations to Combine Ivey, Matsumoto, Tillotson and Slemmer, and Expectation of Success

305. A POSITA would have considered it obvious and would have been motivated to combine the teachings of Ivey, Matsumoto, Tillotson, and Slemmer.

306. As explained above, a POSITA would have been motivated to combine Ivey, Matsumoto, and Tillotson.

307. A POSITA also would have been motivated to adapt the combination in view of the teachings of Slemmer.

308. First, Slemmer is from the same field, addresses the same general concept, and teaches many of the same specific concepts.

309. Slemmer relates to method of directing parking in a parking lot. Slemmer, [0008], [0039].

310. Thus, a POSITA would have appreciated that Ivey's Matsumoto's, Tillotson's, and Slemmer's teachings were well-known and complementary to one another, making them good targets for combination.

311. Second, as explained above, with respect to including audible signals indicating a parking space's payment status, a POSITA would have recognized that adapting the Ivey/Matsumoto/Tillotson combination to include audible signals in view of Slemmer's teachings would have been advantageous for efficiency and ease of use. For example, with an audible signal, a parking enforcement officer would be able to identify, move to, and issue citations for unpaid and/or delinquent parking spaces more efficiently. A parking enforcement officer would be able to be quickly notified of a potential parking citation without individually checking each parking meter. Additionally, the officer would be able to identify unpaid parking spaces without having to take his eyes off the road, when the officer is patrolling a parking area in a vehicle.

312. A POSITA would have had a high expectation of success in adapting the Ivey/Matsumoto/Tillotson combination to include audible signals in view of Slemmer's teachings. Sonification, as described in Slemmer, was already in common practice in applications like assistive interfaces (*e.g.*, for the visually-impaired) or alerts, so implementing such features would have been routine.

313. Moreover, Ivey already displayed payment status indicia on a portable electronic device and, thus, this same information would be suitable to be audibly communicated as taught by Slemmer. Specifically, a POSITA would have been motivated to incorporate Slemmer's audible signals to notify the parking enforcement officer while out on patrol.

314. Furthermore, including audible signals in a parking management system was a conventional and well-known technique at the time of Ivey, Matsumoto, Tillotson, and Slemmer.

315. These parking management systems are all largely software systems, written in various languages.

316. A POSITA would have been well-capable of writing code in any particular language desired, to implement the features and functionalities disclosed in Ivey, Matsumoto, Tillotson, and Slemmer.

317. There would have been no particular barriers to writing such code for these features based on the teachings of Ivey, Matsumoto, Tillotson, and Slemmer.

318. Thus, a POSITA would have expected to be successful in adding these features.

XIV. GROUND 3: WARD IN VIEW OF HAYNES, TILLOTSON, AND THE KNOWLEDGE OF A POSITA RENDERS OBVIOUS CLAIMS 1-3, 5-6

319. In my opinion, a POSITA would have considered Ward, Haynes, and Tillotson to be within the scope of the prior art and highly relevant to the patentability of the 421 Patent's claims.

320. In my opinion, moreover, when viewed and considered in light of the knowledge possessed by a POSITA, Ward, Haynes, and Tillotson together disclose all the limitations of claims 1-3, 5-6 of the 421 Patent and render them obvious.

321. In addition, not only would a POSITA have been motivated to combine and collectively consider the teachings of these references to arrive at the subject matter claimed by the 421 Patent, but they would have had a reasonable expectation of success when doing so.

A. Claim-by-Claim Analysis

1. Claim 1

a. [1.PRE]

“A method for representing the parking status of a plurality of parking spaces to a screen of a user's portable electronic device upon a real time camera view, any of said at least one parking space being one of PAID for current payment and UNPAID upon exhaustion of payment, any of a plurality of subscribers utilizing said method to reserve at least one of the plurality of parking spaces and then to pay for at least one of the plurality of parking spaces, the method comprising:”

322. In my opinion, to the extent that the preamble is limiting, Ward in view of Haynes, as well as Ward in view of Haynes and Tillotson, teaches the preamble.

323. Ward explains that it relates to “[a] payment parking system ... [that] includes an enforcement device that displays a graphical user interface (GUI) that identifies a plurality of the parking spaces and indicia associated with each of the plurality of parking spaces. The indicia indicates whether a parking fee has been paid for the associated parking space.” Ward, Abstract.

324. Ward’s system includes a “personal digital assistant, a portable computer, or a similar device” (Ward, [0020]) with the capability to use “the records to display a graphical depiction of parking meters 20 for which a fee has currently been paid and the parking meters 20 for which a fee has not currently been paid,” and permits payment and reservations of parking spaces. Ward, [0034], [0044], [0047], [0049], [0057]. A POSITA would have understood that these disclosures teach “representing the parking status to a screen of a user’s portable electronic device” as claimed. A “graphical depiction of parking meters” is “the parking status of a plurality of parking spaces.” Ward teaches that this depiction is displayed on Ward’s GUI, which is the “screen of a user’s portable electronic device” as claimed. *Id.*, [0044], [0047], Abstract. A POSITA would have understood that these disclosures further describe that a parking space status is either “PAID” as claimed for those spaces whose payment is “current,” or “UNPAID” as claimed for those

parking spaces whose payment is exhausted (*i.e.*, “for which a fee has not currently been paid”). *Id.*, [0044], [0046].

325. As I note above, Ward teaches that its parking status information is displayed as a graphical representation of parking spaces in the area nearby the user. Ward, [0044], [0049]. Ward does not teach the use of a real-time camera view to display parking information, but Haynes does. A POSITA would have readily appreciated that Haynes teaches the use of a camera view of a parking lot, including displaying additional parking information superimposed on the camera view. I discuss Haynes in detail in my analysis of limitation [1.H] below. I note further here and below that Haynes teaches that its camera view can be a dynamic view, which a POSITA would have understood is “real-time” as claimed.

326. I observe that the final portion of the preamble recites a plurality of users reserving and paying for parking spaces. A POSITA would have understood that Ward teaches both of these limitations. Ward teaches that its customers (*i.e.*, subscribers as claimed) can enter an identifier for a parking space that the customer wishes to park in, as well as a time period the user wishes to park for. Ward, [0030], Figs 2b-d and associated text. A POSITA would have understood that this teaching is “reserving” a parking space as disclosed and claimed in the 421 Patent. I note that the 421 Patent, when it discusses “reserving” a parking space, simply states that a subscriber can “reserve” at least one parking space, and then pay for it. *See, e.g.*,

421 Patent, 14:64-67; 16:20-25. Nothing in the 421 Patent imposes any particular length of time in advance of paying for a parking space that the subscriber must “reserve” it.

327. Additionally, as I discuss in Section XII.A.1.[PRE] above, Tillotson teaches a parking space information and reservation system (PSIRS). This system specifically allows users to reserve parking spaces and then pay for them on a per-use charge basis. Tillotson, [0023], [0065]. To the extent that the 421 Patent were read to require reserving parking spaces for a period of time in advance of paying for those spaces, a POSITA would have readily appreciated that Ward’s system could have been adapted in view of Tillotson’s teachings of a reservation system that allows users to reserve spaces and then pay for those spaces on a per-use basis. Such a system would provide added flexibility in allowing users to select parking spaces in advance of when the users actually intended to park in those spaces.

b. [1.A]

“assembling a database upon a computer of said plurality of parking spaces, said database including geographic locations of said plurality of parking spaces and time limits applicable to each of said plurality of parking spaces;”

328. In my opinion, Ward teaches this limitation. Ward teaches that its system includes a “database or a similar data storage system in which parking records obtained from the parking meter 20 and from the mobile device 30 can be

stored and from which the records can be retrieved.” Ward, [0042]. A POSITA would have understood that this database is the claimed “database ... of said plurality of parking spaces.” Ward further teaches that its system can access and use the records to “display a graphical depiction of the parking meters 20 ... The display might include a map of the streets, garages, or other locations at which the parking meters 20 are present.” *Id.*, [0044]-[0045], Fig. 3b. A POSITA would have understood this to teach the “geographic locations” clause of this limitation. Streets, garages and other locations where parking meters are present are “geographic locations.” Finally, Ward teaches that the parking records include time limits for each parking space. For example, a parking space can have a limit of 2 hours. *Id.*, Fig. 2c-d and associated text (2 hour limit). This means that the user can select any desired amount of time for parking, up to the limit. *Id.*, [0030].

c. [1.B]

“updating a database upon a computer of subscribers, said database including a list of parking spaces reserved by each subscriber, a list of parking spaces paid for by each subscriber, and a list of the expiration times for each paid for parking space of each subscriber;”

329. In my opinion, Ward and Ward in view of Tillotson each teach this limitation.

330. For the “updating a database upon a computer of subscribers” clause, Ward teaches a database that stores (*i.e.*, updates) parking records from the mobile

devices of the customers (*i.e.*, subscribers.) These parking records include a variety of information about each parking space that the subscriber reserves and pays for. This information includes the entries shown in Figs 2b-d (Ward, [0030]-[0033]) which include the identifiers of the parking spaces the subscriber has selected as well as the charges the user has agreed to pay based on the time selected. *Id.* The set of parking records that are received from all of the various customers' mobile devices and are stored in Ward's database is what a POSITA would have understood to be a list of parking records, each of which contains the parking space reserved, the parking space paid for, and the expiration time provided by the user (*i.e.*, based on the "time purchased" and the time the purchase request was transmitted). *Id.*, [0034]-[0036].

331. Ward further teaches that these records can be used to alert customers that their paid-for time is about to expire. Ward, [0060]. Thus, a POSITA would have understood that the system stores the expiration time data in order to know when to send this alert. Furthermore, a POSITA would have understood that this alert required knowing the customer and the parking space about which to send the alert. Such information would be drawn from the lists of parking records stored in the database, which include lists of parking spaces reserved and paid for, and lists of the subscribers who made those reservations and payments.

332. A POSITA also would have considered this limitation obvious over Ward in view of the teachings of Tillotson. As I discuss in Section IX.A.1.c above, Tillotson also discloses displaying parking space availability, reserving parking spaces, and monthly subscriptions. Tillotson, Abstract, [0025], [0061], [0067]. And a POSITA also would have found it obvious to use the above-described teachings to adapt Ward’s system to enable a user of Ward’s system to “reserve” a parking space. Tillotson teaches that users can reserve a parking space and select a desired time interval in which to park. Tillotson, [0053]. Adapting Ward to provide this feature would simply involve allowing a user of Ward’s system to designate a start time in the future. This would not be difficult to code. Such a system would provide added flexibility in allowing users to select parking spaces in advance of when the users actually intend to park in those spaces.

d. [1.C]

“calculating a location of said user, said calculating a location of said user adapted to utilize a location finding feature of said user's portable electronic device;”

333. In my opinion, Ward teaches this limitation. Ward teaches identifying the location of an enforcement officer or enforcement officer’s “portable computer” (*i.e.*, the “user” as claimed) “with a positioning system, such as a geographical positioning system (GPS)” to readily determine the location of the officer in order to identify nearby parking spaces. Ward, [0049]. GPS is a well-known “location-

finding feature” that has been in use since at least the 1970s by the US military, and has been available for public use since at least 1995.

e. [1.D]

“determining upon a computer a location of one of said plurality of parking spaces by comparing the location of said user to said database of said plurality of parking spaces and selecting one of said plurality of parking spaces within eight to ten feet of the position of said user;”

334. In my opinion, Ward teaches this limitation. Ward talks about an enforcement officer using a “personal digital assistant, a portable computer, or a similar device.” Ward, [0049]. The device may be “equipped with a positioning system, such as a geographical positioning system (GPS).” *Id.* This GPS system is used to identify the location of the user, which “allow[s] the enforcement office[r] to more readily determine the location of nearby parking spaces.” *Id.*

335. Ward further teaches that a customer (*i.e.*, a person searching for a parking space) also can use GPS to identify the customer’s location. Ward, [0059]. This customer’s GPS-based location is “combined with the records of the meter management system” and used “to create a map that could be displayed on the screen of the mobile device and could show the presence of vacant parking spaces near the customer’s current location.” Ward, [0059]. A POSITA would have understood that combining a location with the database records is comparing the user’s location with the vacant parking spaces “near the customer’s current location.” A POSITA would

have further understood that the enforcement officer would (or at least could) use exactly the same steps to derive the same map of parking spaces near the enforcement officer. A POSITA would have readily appreciated the benefits of allowing the enforcement officer to have the same ability to identify nearby spaces as the customer has. Since Ward's system already performs this comparison between customer data and the parking records, a POSITA would have readily appreciated that that same comparison would be trivial to implement for the parking officers as well. It would merely require providing the parking officer's location, instead of the customer's location, to Ward's system.

336. As for the last clause "within eight to ten feet of the position of said user," Ward teaches this clause as well. Ward teaches that an enforcement officer can "walk alongside the street" and compare parking spaces with the indicators on the officer's computer. Ward, [0049]. A POSITA would have understood that an officer walking "alongside" a street on which the parking spaces were located was walking within eight to ten feet of those spaces. This is what is depicted in Fig. 3b of Ward. In the event that Ward's teachings somehow are found not to expressly teach "within eight to ten feet" to a POSITA, then it would have been obvious to adapt Ward's system to select a parking space within eight to ten feet of the user.

337. In order for an enforcement officer to perform enforcement duties, the officer will typically need to stand next to the vehicle in order to gather identifying

information about the vehicle, write a parking ticket, and leave that ticket on the vehicle. *See, e.g.*, Ward, [0049] (describing printing out a citation “on the spot” when a violation is observed). Thus, the officer would benefit from having the display only show those parking spaces which are close enough to the officer that the officer could engage in enforcement actions. This would also reduce the amount of data shown on what is typically a small screen of a personal digital assistant or portable computer as described by Ward.

f. [1.E]

“comparing upon a computer the location of one of said plurality of parking spaces with said database of subscribers further comprising comparing upon a computer the location of one of said plurality of parking spaces against said list of parking spaces paid for by said subscribers for a match between said location and said list of parking spaces paid for by said subscribers;”

338. In my opinion, Ward teaches this limitation. Each parking space in Ward is associated with a location and an indicator of payment status. Ward, [0047]. The indicator of payment status is derived from the subscriber records supplied to Ward’s system. *Id.*, [0044]. For example, the subscriber uses his mobile device to reserve and pay for a parking space, as shown in Fig. 2c-d. This record is stored in Ward’s database. *Id.*, [0042]. The location data of a parking meter is also stored in Ward’s database. *Id.*, [0042]-[0046]. Ward discloses that the municipality computer 70 has “the capacity to use the records to display a graphical depiction of the parking

meters 20 for which a fee has currently been paid and the parking meters 20 for which a fee has not currently been paid. The display might include a map of the streets, garages, or other locations at which the parking meters 20 are present.” *Id.*, [0044]. Additionally, Ward teaches that its system can send an alert to a subscriber, advising that subscriber that his parking meter is about to run out of time. *Id.*, [0060].

339. A POSITA would have understood this to teach that the location records are compared with the subscriber records reflecting the payment status to identify a match in order to accurately display the payment status on the location-based display, and to accurately route the alerts. In order to use the parking and subscriber records to display graphical depictions of the parking meters and send alerts, a POSITA would have understood that Ward’s system needs two pieces of information. First, Ward’s system needs to know which parking meter to display on the display. This information is contained in Ward’s parking location data for a parking meter. Ward, [0042]-[0046]. Second, Ward’s system needs to know whether a particular parking meter has been paid for, and by whom. This information is contained in Ward’s customer records received from the customer’s mobile devices. *Id.*, [0042]. In order to correlate the parking meter information, the payment information, and the subscriber information, a POSITA would have understood that Ward’s system compares these three pieces of information to

identify a match between a parking meter (including its location) and a subscriber (including payment information).

g. [1.F]

“upon detecting a match between said location and said list of parking spaces paid for by said subscribers, comparing the matched parking spaces to said list of expiration times and upon detecting the matched parking spaces exceeding an expiration time displaying upon said user's screen an UNPAID payment indicia upon an image of the matched parking space, wherein the user may execute enforcement measures upon any vehicle in said matched parking space showing said UNPAID indicia;”

340. In my opinion, Ward teaches this limitation. Ward teaches that display screen 240 includes a map 250 that includes “an indicator 280 ... associated with each of the virtual parking spaces 270 to provide a graphical depiction of whether a fee has currently been paid for the parking meter 20 associated with the actual parking space 210 depicted by the virtual parking space 270.” Ward, [0046], Fig. 3b.

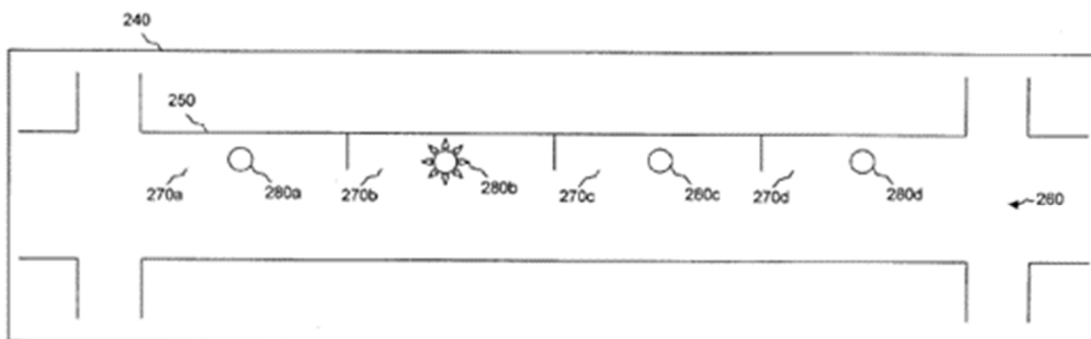


Figure 3b

341. Because Ward's display provides a graphical depiction of whether a fee has "currently" been paid, Ward checks the expiration time in order to make the determination as to whether the fee is "current" or not. A POSITA would have understood that Ward's system determines whether the fee for a given parking meter is "current" or not. The POSITA would have further understood that a user provides Ward's system with a time amount that the user wishes to park. The POSITA would have further understood that Ward's system uses this time amount, along with a designated start time, to determine the period of time in which the user is allowed to park. Ward, [0036] (system starts counting time when the user requests a parking space); *id.*, [0037] (amount of time is credited to a parking meter, which decreases over time). Ward's system further knows the expiration time for each parking space because Ward's system sends an alert to the user when the expiration time is near. *Id.*, [0060]. Once the time counts down to zero, the fee that was paid is no longer current, and the parking meter is in an unpaid (or not currently paid) state. *Id.*, [0044]-[0047].

342. Ward further teaches a variety of different indicators, such as a non-illuminated light, a light of a different color, or a pair of lights one of which indicates "when a fee has not been paid," that can be used to indicate that a fee has not currently been paid (*i.e.*, an "UNPAID" indicator as claimed). Ward, [0046]. These indicators are placed on the image of the parking space, as shown in Fig. 3b. Ward

further teaches that “enforcement actions” can be initiated against any vehicle for which a fee has not been paid. *Id.*, [0051].

h. [1.G]

“wherein said method transforms upon a computer location data of said plurality of parking spaces and payment status data of said plurality of parking spaces into indicia of UNPAID parking spaces;”

343. In my opinion, this language, to the extent that it expresses any further limitation on claim 1, is taught by Ward. As I discuss above for limitations [1.PRE]-[1.F], Ward’s system takes in parking records from the parking meter (*i.e.*, location data of the plurality of parking spaces) and records from the subscriber’s mobile device 30 (*i.e.*, payment data from the user, including the length of time the user wishes to park). Ward, [0042]-[0044]. Ward uses this data to “display a graphical depiction of the parking meters 20 for which a fee has currently been paid and the parking meters 20 for which a fee has not currently been paid.” *Id.*, [0044]. *See also id.* [0046], [0051], Figs. 2c-d, 3b.

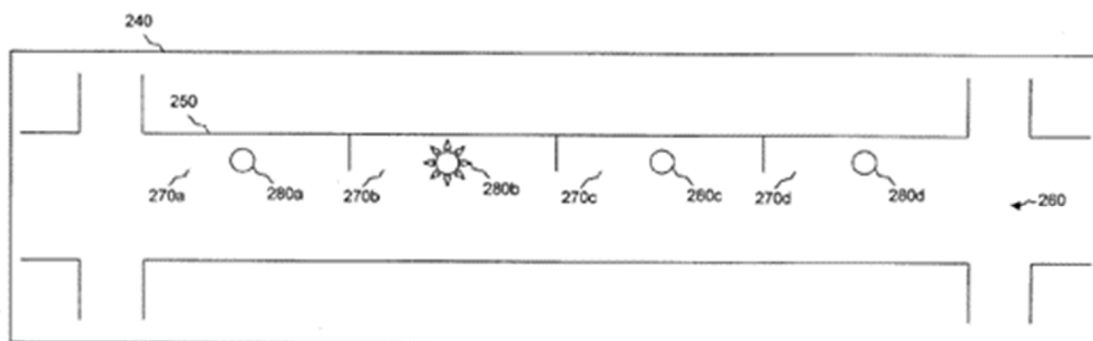


Figure 3b

344. This graphical depiction includes indicators 280 which indicate for each parking space whether the fee has currently been paid. Ward, [0046]. Thus Ward's system would have been understood by a POSITA to transform the parking records and the subscriber's payment records into the indicator 280 (*i.e.*, indicia) of an "UNPAID" state as claimed.

i. [1.H]

"said comparing the matched parking space to said list of expiration times and upon detecting the matched parking space exceeding an expiration time and said method places said indicia of UNPAID on an image of a matched parking space upon the real time camera view on the screen of a user's device for enforcement."

345. In my opinion, the combination of Ward and Haynes teaches this limitation. A POSITA would have understood this limitation to be describing the previous comparison and detection steps of limitation [1.F], with the further limitation of the indicia of UNPAID being placed on an image of a matched parking space upon the real time camera view that is displayed on the user's device screen, such that the user can use this information for enforcement.

346. As I discuss above with respect to limitation [1.F], Ward teaches the comparison and detection steps. Ward further teaches a user's device, including a "personal digital assistant, a portable computer, or a similar device" with the capability to use "the records to display a graphical depiction of parking meters 20

for which a fee has currently been paid and the parking meters 20 for which a fee has not currently been paid.” Ward, [0034], [0044], [0047], [0049], [0057]. These teachings teach all parts of this limitation, except for the “upon the real time camera view” clause.

347. As I noted above, Ward teaches using a map that depicts a street and parking spaces. Ward, [0046]. Ward further teaches that this “virtual street” corresponds to an “actual street.” *Id.* A POSITA would have understood that Ward’s virtual street was supposed to be a close depiction of the real street, as this would simplify the parking officer’s efforts to compare the virtual street on his display with the real street that the parking officer is walking along side, as the officer seeks to identify cars that require enforcement actions. *Id.*, [0049].

348. Thus, a POSITA would have been motivated to implement a system that could display a high-quality depiction of the real street. Such high-quality depictions of real streets were well-known in the prior art of parking control and enforcement systems.

349. For example, Haynes teaches a method for managing a parking lot, including transmitting parking lot information to various “interaction devices” (*i.e.*, a user’s device as claimed). Haynes, 2:6-20. These devices include a “personal interaction device” (*i.e.*, a user’s device as claimed.) *Id.*, 9:29-39. Haynes further teaches that its system relies on “video interaction devices 1400” to provide video

data to the personal interaction device 1600. *Id.*, 7:66-8:8. This video information can include parking lot data and/or information. *Id.*, 4:50-52. This data can further include “video data regarding the location, path, speed, and acceleration of vehicle 1520.” *Id.*, 7:66-8:8.

350. Haynes discloses the display on a personal interaction device of a variety of different representations of a parking lot, including displaying a “representation of parking lot 1320, which can be actual” (*i.e.*, a camera view from one or more of the video interaction devices 1400) of the parking lot depicted from a specified or variable location such as out the front windshield of a vehicle. Haynes, 12:62-13:8, 13:32-43. This representation can be dynamically updated in real time. *Id.*, 13:32-43. This representation can be enhanced with additional data about the parking spaces, such as identifying an “optimal” parking space. *Id.*

351. In my opinion, A POSITA would have found it obvious to apply Haynes’ teachings of an actual representation of a parking lot (*i.e.*, a camera view), dynamically updated in real time and enhanced with data about the parking spaces, to Ward’s system for displaying the payment status of each parking meter nearby an enforcement officer. As I note above, Ward teaches that its displayed “virtual street” corresponds to a real street. A POSITA would have understood from Haynes the value of using an image of the actual street, to better allow the enforcement officer of Ward to compare the virtual street with the real street, as taught by Ward. Ward,

[0049]. By looking at an image of the actual street, the officer could more easily and rapidly identify the real locations that corresponded to the virtual locations on his display. He could thus more easily and rapidly identify those parking spaces for which no fee was paid, and compare those with the actual spaces to see if a car was improperly parked in the space.

352. A POSITA would have further understood from Haynes that this image of the street could advantageously be a dynamic image that could be updated in real time. Haynes, 13:33-43. Again, real-time updates would allow the officer to get a more accurate view of the parking meters and the street, to more easily identify parking meters for which no fee had been paid, as well as to identify whether a car was currently parked in such a space.

2. Claim 2

“The method for representing the parking status of claim 1 further comprising: opening an account for each of said subscribers wherein said account permits each of said subscribers to reserve at least one of said plurality of parking spaces and permits each of said subscribers to pay for at least one of said plurality of parking spaces utilizing means of electronic payment.”

353. As I discuss above, it is my opinion that Ward in view of Haynes, Tillotson, and the knowledge of a POSITA discloses all limitations of Claim 1. It is further my opinion that the additional limitations of claim 2 are disclosed by each of

Ward, and Ward in view of Tillotson, or at least are obvious in view of the knowledge of a POSITA.

354. The claim recites opening an account for each subscriber. Ward discloses user accounts for each customer (*i.e.*, “subscriber” as claimed), which are provided by the customer’s telecommunications provider 40. Ward, [0039]-[0041]. These accounts can be used by the customers to reserve parking spaces, by providing the information set forth in Fig. 2b-d. *Id.*, [0030], Fig. 2b-d. These accounts can be used by the customers to pay for parking spaces by having the charges for the parking spaces placed on their mobile phone bill. *Id.*, [0021], [0039]-[0041]. A POSITA would have understood that before any account can be used by a customer, that account must first be opened.

355. Ward additionally discloses that its customers can use their cell phones to access the parking management system and pay the parking fees which are placed on the customer’s bill. Ward, [0020]-[0021], [0039]-[0041]. A POSITA would have understood that the customer’s wireless communications provider bill reflects a cell phone account. A cell phone is a well-known example of a wireless communications device, and the provider’s bill is associated with the customer, since that is how the correct customer is charged. I observe that a cell phone account is defined in the specification as a means of electronic payment as claimed. 421 Patent, 16:20-24.

356. To the extent that Ward is deemed not to teach some portion of this claim, a POSITA would have considered any such portion obvious in view of Tillotson. As I discuss in Section XII.A.2 above, Tillotson discloses a parking space information and reservation system (PSIRS), which includes an operations center, which in turn includes a user account database. Tillotson, [0023], [0029], [0065]. These user accounts are used to allow the users to reserve and pay for parking spaces, using credit cards which are another defined “means of electronic payment” in the 421 Patent. 421 Patent, 16:20-24. As I describe herein, a POSITA would have been motivated to combine Tillotson with Ward in order to adapt Ward’s system with the reservation system of Tillotson.

357. Indeed, the 421 Patent admits that the opening and use of parking subscriber accounts with electronic payment has long been understood and practiced for decades. 421 Patent, 3:19-26 (“The publication to Chatterjee, No. 2004/0068433 illustrates a parking system with maps of parking spaces that allows subscribers to pay for parking by wireless or web communications.”). A POSITA would thus have been well aware of using subscriber accounts to streamline the process of reserving and paying for parking spaces using means of electronic payment.

3. Claim 3

**“The method for representing the parking status of claim 1
further comprising: said indicia of UNPAID overlaying upon said**

user’s screen one of the word UNPAID, a colored logo, a circle with a bar, and a letter X.”

358. As I discuss above, Ward in view of Haynes, Tillotson, and the knowledge of a POSITA discloses all limitations of Claim 1. The additional requirements of claim 3 are disclosed by Ward, or at least are rendered obvious in view of the knowledge of a POSITA.

359. As I discuss above for claim 1, Ward teaches the use of “indicators 280” that are “lights that are illuminated when a fee has been paid and that are not illuminated when a fee has not been paid, lights that are a first color when a fee has been paid and a second color when a fee has not been paid.” Ward, [0046]. A POSITA would have understood that the use of colored lights to indicate non-payment status satisfies the 421 Patent’s teaching of using a “colored logo.” The 421 Patent does not provide any definition or indeed any meaningful discussion of what a “colored logo” would be. 421 Patent, 15:57-62. Since the apparent function of this colored logo is simply to provide an indication of PAID or UNPAID status, a POSITA would have understood that this could be any type of color-based symbol that the user would understand to be an indicator of PAID or UNPAID status. This would have included Ward’s use of colored lights to indicate when fees had been paid or not paid.

360. Additionally, it would have been obvious to a POSITA in view of Ward's teachings that "other types of indicators well known to those of skill in the art" could be used (Ward, [0046]), that such other types of indicators could include a letter "X" or a circle with a bar. Both of these indicators were very well known as indicators for negative status, such as something that is not permitted or allowed. Indeed, the universally-recognized symbol for "no parking" is a circle with a bar through it. *See, e.g.*, EX1020, Convention on Road Signs and Signals, Vienna, Nov. 8, 1968, Annex 6, Section A.1 (describing a sign for indicating where parking is prohibited, which is "a circular sign with a red border and a red transverse bar"). Similarly, a letter X is the international symbol for a "no stopping" zone.



No Parking



No Stopping

4. Claim 5

a. [5.PRE]

"A method for representing the parking status of a plurality of parking spaces to a screen of a user's portable electronic device upon a real time camera view, any of said at least one parking space being one of PAID for current payment and UNPAID upon exhaustion of payment, any of a plurality of subscribers utilizing said method to reserve at least one of the plurality of parking spaces and then to pay for at least one of the plurality of parking spaces, the method comprising:"

361. In my opinion, this preamble, if limiting, is taught by Ward in view of Haynes, as well as Ward in view of Haynes and Tillotson, for the same reasons explained for preamble [1.PRE]. *See supra* Section XIV.A.[1.PRE].

b. [5.A]

“assembling a database of said plurality of parking spaces, said database including geographic locations of said plurality of parking spaces and time limits applicable to each of said plurality of parking spaces and storing said parking space database upon a computer server;”

362. In my opinion, Ward in view of Tillotson teaches this limitation, or at least renders it obvious in view of the knowledge of a POSITA. The only difference between claim limitations [1.A] and [5.A] is the deletion of “upon a computer” and additional recitation of “storing said parking space database upon a computer server.” The deletion of “upon a computer” does not alter my view of the art or its relevance to the claim. Ward teaches assembling the database on a computer, and a POSITA would have understood that this teaching also teaches the more generic “assembling a database” limitation set forth here. Thus, the “assembling” limitation is taught by Ward for the same reasons explained for limitation [1.A]. *See supra* Section XIV.A.[1.A].

363. In my opinion, Ward also teaches the “storing” requirement. Ward teaches that a “server” can be used to provide the content that is shown to the mobile device 30, including the parking information. Ward, [0067], claim 24 (“a server to

track parking information”). Tillotson also discloses the “storing” requirement. Tillotson describes a parking space information and reservation system (PSIRS), which comprises an operations center 202 (*i.e.*, a computer server as claimed), which includes a parking database 206 (*i.e.*, a parking space database as claimed). Tillotson, [0023].

c. [5.B]

“updating a database of subscribers, said database including a list of parking spaces reserved by each subscriber, a list of parking spaces paid for by each subscriber, a list of the expiration times for each paid for parking space of each subscriber, and storing said subscriber database upon a computer server, and further including enrolling each of said subscribers into a membership plan for parking payment;”

364. In my opinion, Ward in view of Tillotson discloses this limitation. The only material difference between claim limitation [1.B] and [5.B] is the additional recitation of “storing said subscriber database upon a computer server, and further including enrolling each of said subscribers into a membership plan for parking payment.” Ward teaches storing its databases on a server. Ward, [0067], claim 24 (“a server to track parking information.”). Furthermore, this additional limitation is taught by Tillotson, as discussed above in Section XIV.A.1.c above.

d. [5.C]

“calculating a location of said user, said calculating a location of said user adapted to utilize a location finding feature of said user's portable electronic device;”

365. In my opinion, this limitation is taught by Ward for the same reasons I explain above for limitation [1.C]. *See supra* Section XIV.A.1.d.

e. [5.D]

“determining upon a computer server a location of one of said plurality of parking spaces by comparing the location of said user to said database of said plurality of parking spaces and selecting one of said plurality of parking spaces within eight to ten feet of the position of said user;”

366. In my opinion, Ward teaches this limitation for the same reasons I explain above for limitation [1.D]. *See supra* Section XIV.A.1.e. The only difference between claim limitations [1.D] and [5.D] is the addition of the word “server.” A POSITA would have understood that the addition of this language would not alter the analysis. Servers are very well-known examples of “computers,” used to make resources available to multiple different users at a time. These resources can include files, databases, or any other resources that it is desirable to share amongst multiple users. Thus, a POSITA would have readily understood that Ward’s disclosures of a meter management system that includes a computer and a database is disclosing a server as claimed. (Ward, [0042]). Ward’s computer and database are used to store and receive parking records (*id.*). They are used by all of Ward’s customers to reserve and pay for parking spaces (*id.*, [0027]), as well as all of Ward’s enforcement officers who monitor the parking spaces and engage in enforcement activities (*id.*, [0044]).

f. [5.E]

“comparing upon a computer server the location of one of said plurality of parking spaces with said database of subscribers further comprising comparing upon a computer the location of one of said plurality of parking spaces against said list of parking spaces paid for by said subscribers for a match between said location and said list of parking spaces paid for by said subscribers”

367. In my opinion, Ward teaches this limitation for the same reasons I explain above for limitation [1.E]. *See supra* Section XIV.A.1.f. The only difference between claim limitations [1.E] and [5.E] is the addition of “server.” As I discuss above, the addition of this language does not alter my view of the art or its relevance to the claim.

g. [5.F]

“wherein upon detecting a match between said location and said list of parking spaces paid for by said subscriber, comparing the matched parking space to said list of expiration times and further upon detecting the matched parking spaces exceeding an expiration time displaying upon said user’s screen an UNPAID indicia upon an image of the matched parking space, wherein the user may execute enforcement measures upon any vehicle in said matched parking space showing said UNPAID indicia;”

368. In my opinion, Ward teaches this limitation for the same reasons I explain above for limitation [1.F]. *See supra* Section XIV.A.1.g. The only differences between claim limitations [1.F] and [5.F] are minor (adding “further,” replacing “subscribers” and “spaces” with “subscriber” and “space,” and deleting the term “payment” between “UNPAID” and “indicia”). These differences do not

alter my view of the art or its relevance to the claim. The term “further” adds nothing of substance to a POSITA. Changing the plural “subscribers” and “spaces” to the singular “subscriber” and “space” also makes no difference to the analysis. Ward discloses users reserving and paying for parking spaces without any restrictions on the number of such spaces a subscriber could reserve or pay for. Thus, Ward’s teachings would be seen by a POSITA as equally applicable to any number of subscribers and spaces. The term “payment” would be seen by a POSITA as largely redundant of the term “UNPAID.” That is, an “UNPAID” indicia is necessarily an indicia of some kind of “payment” status.

h. [5.G]

“wherein said method transforms upon a computer location data of said plurality of parking spaces and payment status data of said plurality of parking spaces into indicia of UNPAID parking spaces;”

369. In my opinion, Ward teaches this limitation, to the extent it is even limiting, for the same reasons I discuss above for limitation [1.G]. *See supra* Section XIV.A.1.h.

i. [5.H]

“said comparing the matched parking space to said list of expiration times and upon detecting the matched parking space exceeding an expiration time and said method places said indicia of UNPAID on an image of a matched parking space upon the real time camera view on the screen of a user's device for enforcement.”

370. In my opinion, Ward in view of Haynes teaches this limitation for the same reasons I discuss above for limitation [1.H]. *See supra* Section XIV.A.1.i.

5. Claim 6

“The method for representing the parking status of claim 5 further comprising: wherein said indicia of UNPAID includes one of the word UNPAID, a colored logo, a circle with a bar, and a letter X.”

371. In my opinion, as I explain above, Ward in view of Haynes and Tillotson and the knowledge of a POSITA discloses all limitations of Claim 5. Furthermore, it is my opinion that this limitation is disclosed by Ward or at least is rendered obvious in view of the knowledge of a POSITA, for the same reasons as I discuss above for claim 3.

B. Motivations to Combine Ward, Haynes, and Tillotson, and Expectation of Success

372. In my opinion, a POSITA would have been motivated to combine Ward, Haynes, and Tillotson for at least the following reasons.

373. First, Ward, Haynes, and Tillotson are from the same field (parking space management) and address the same general concept (facilitating parking by providing information regarding the availability of parking spaces). They also teach many of the same specific concepts, as discussed above. A POSITA would therefore have appreciated that Ward’s, Haynes’, and Tillotson’s teachings were well-known and were complementary to one another, making them good targets for combination.

374. Second, with respect to the displaying of parking space payment status information upon a real-time camera view, a POSITA would have recognized that Haynes' teaching to add that information in a real-time view would be advantageous to Ward because the manner of displaying that information was known to facilitate a parking enforcement officer's verification of payment status of multiple parking spaces simultaneously. This is an issue that would have been very familiar to a POSITA during the relevant time period (in part because a POSITA would have had experience with local enforcement of remotely managed parking payment systems), and is an easily-improved shortcoming of Ward's approach. A POSITA would have readily appreciated that adapting Ward to include payment status information on a real-time camera view in light of Haynes' teachings would more efficiently streamline parking enforcement. For example, with Haynes' "real time camera view," a parking enforcement officer would be able to identify, move to, and issue citations for unpaid and/or delinquent parking spaces more efficiently. The officer could more readily determine exactly which vehicle was in violation, because the actual vehicle would be displayed on the officer's screen, along with the indicia that the parking space was unpaid. A parking enforcement officer would be able to quickly assess the number of potential parking citations on a street block without walking the entire block and individually checking each parking meter.

375. Third, with respect to including reservation and subscription systems, a POSITA would have recognized that adapting Ward in view of Tillotson's teachings would have been advantageous to both Ward and Haynes and would make the parking management system more efficient—a result that would have been highly desirable to a POSITA during the relevant time period, particularly in settings with high usage or limited resources. Specifically, a POSITA would have been motivated to incorporate Tillotson's reservation and subscription systems to simplify the payment process for reservation and subscription fees. The combination would have predictably resulted in a motorist being able to reserve and/or prepay for a parking space, thereby, simplifying the payment process and reducing the time required for the motorist (*i.e.*, instead of having to identify a vacant parking space, park, and locate the relevant manner to pay for the parking space). Additionally, the incorporation of a reservation and subscription system would enable the repeated and quick acceptance of payment for the parking management operator and parking enforcement officer as well. Additionally, allowing users to reserve parking spaces would help reduce the number of vehicles circling a parking area searching for an open parking space. Similarly, a reservation system would allow the lot manager to have more predictability as to the expected volume of vehicles. And the users would benefit as well, since they would be assured of having a parking space waiting for them when they arrived.

376. A POSITA would have had a high expectation of success in adapting Ward in view of Haynes' real-time camera view teachings and Tillotson's reservation and subscription systems teachings. As discussed above, Ward, Haynes, and Tillotson are from the same field and teach many similar concepts, so a POSITA would have understood that their disclosures were likely complementary. Moreover, Ward already displayed payment status indicia on a portable electronic device and, thus, this same information would be suitable to be displayed upon a real-time camera view as taught by Haynes. Similarly, Ward already accepted payment to reserve parking spaces such that only minor changes would be involved in adapting Ward in view of Tillotson's parking space information and reservation system (PSIRS). Furthermore, adding these features to a parking management system was a conventional and well-known technique at the time of Ward, Haynes, and Tillotson. These parking management systems are all largely software systems, written in various languages. A POSITA would have been well-capable of writing code in any particular language desired to implement the features and functionalities disclosed in Ward, Haynes and Tillotson. There would have been no particular barriers to writing such code for the features desired to be added based on the teachings of Ward, Haynes and Tillotson. A POSITA schooled in AR would have been familiar with the techniques and available frameworks, such as mentioned in Sections VII.B and

C to appropriately render the information atop the live image. Thus, a POSITA would have expected to be successful in adding these features.

XV. GROUND 4: WARD IN VIEW OF HAYNES, TILLOTSON, SLEMMER, AND THE KNOWLEDGE OF A POSITA RENDERS OBVIOUS CLAIMS 4, 7

377. In my opinion, the combination of Ward, Haynes, Tillotson, and Slemmer, when considered in view of the knowledge of a POSITA, renders claims 4 and 7 obvious.

378. As I discuss in detail above, Ward in view of Haynes and Tillotson teach all limitations of claims 1 and 5. It is my opinion that Slemmer teaches the additional limitation recited in claims 4 and 7 that the indicia include an audible recitation.

A. Claim-by-Claim Analysis

1. Claims 4 and 7

379. Claim 4 depends on claim 1 and recites:

“The method for representing the parking status of claim 1 further comprising: said indicia of UNPAID including an audible recitation.”

380. Claim 7 depends on claim 5 and recites:

“The method for representing the parking status of claim 5 wherein: said indicia of UNPAID includes an audible signal transmitted from a computer server to the user's portable electronic device.”

381. In my opinion as I explain above, Ward in view of Haynes, Tillotson, and the knowledge of a POSITA discloses all limitations of Claims 1 and 5, including the “indicia of UNPAID” being provided from Ward’s computer server to the screen of the user’s portable device. These UNPAID indicia are various forms of digital data displayed on a screen (*e.g.*, lights that are either on or off or are of different colors) (Ward, [0046]), rather than an audible recitation or audible signal.

382. As I discuss in Section XIII.A above, such a recitation or signal is disclosed by Slemmer, or at least would have been obvious in view of the knowledge of a POSITA. It would have been obvious to a POSITA to use Slemmer’s disclosure of converting digital data about a parking space to a verbal message to convert the digital UNPAID indicia of Ward into an audible recitation of that same indicia. Ward teaches a POSITA about the benefits of providing the UNPAID indicia to an enforcement officer in an easily understood format. Ward, [0047]-[0049]. A POSITA would have understood, however, that in some circumstances, such as when an enforcement officer is driving along a street as disclosed in Ward, the officer’s visual attention may need to be on the street in front of the officer’s car, rather than on the display on the computer 70. In such circumstances, a POSITA would have appreciated that Slemmer’s teachings of converting digital data (such as video data) into audible recitations or indications, would beneficially allow the enforcement officer to be alerted to the presence of a parking space with the

UNPAID indicator, without diverting the officer's visual attention from the roadway. Additionally, Ward discloses audio output as an option that could be used in his invention. *Id.*, [0075].

B. Motivations to Combine Ward, Haynes, Tillotson and Slemmer, and Expectation of Success

383. As I explain above, a POSITA would have been motivated to combine Ward, Haynes, and Tillotson. A POSITA also would have been motivated to adapt that combination in view of Slemmer's teachings as well.

384. First, Slemmer is from the same field, addresses the same general concept, and teaches many of the same specific concepts, as discussed above. Thus, a POSITA would have appreciated that Ward's, Haynes', Tillotson's, and Slemmer's teachings were well-known and complementary to one another, making them good targets for combination.

385. Second, as I explain above, with respect to including audible signals indicating a parking space's payment status, a POSITA would have recognized that adapting the Ward/Haynes/Tillotson combination to provide audible signals indicating payment status in view of Slemmer's teachings would have been advantageous to the Ward/Haynes/Tillotson combination for efficiency and ease of use.

386. A POSITA would have had a high expectation of success in adapting Ward to include audible signals in view of Slemmer's teachings. As discussed above, Slemmer is from the same field and teaches many similar concepts, so a POSITA would have understood that their disclosures were likely complementary. Moreover, Ward already displayed payment status indicia on a portable electronic device and, thus, this same information would be suitable to be audibly communicated as taught by Slemmer. Additionally, techniques for converting digital data to audio recitations or alert sounds were common and well-known to a POSITA. Text readers for reading web content to sight-impaired individuals is one such example. Playing an audible alert when a digital event occurs (such as AOL's well-known "You've Got Mail!" audio recitation when a user received a new e-mail) is another such example. A POSITA would not need to even engage in that complex of an endeavor in order to implement the subject matter of claims 4 and 7. All that a POSITA would need to do is program the officer's computer to emit some kind of an audible tone at the same time that the officer's computer displayed the visual indicia of "UNPAID." For example, when Ward's system displayed a light indicating the UNPAID status, all that would be needed is to also emit an audio signal of some sort. This could be a simple tone, or a computer-generated voice announcing that the parking space was "UNPAID." Such straightforward adaptations of Ward would have been well within the ability of a POSITA, having

the motivation of Slemmer's teachings to guide his way. Thus, a POSITA would have expected to be successful in adding these features.

XVI. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

387. In the course of my review of the materials discussed herein, I did not become aware of any evidence suggesting the existence of any secondary indicia or considerations of non-obviousness. In the event that Patent Owner proffers any such evidence, I shall provide my opinions on such evidence in a reply declaration.

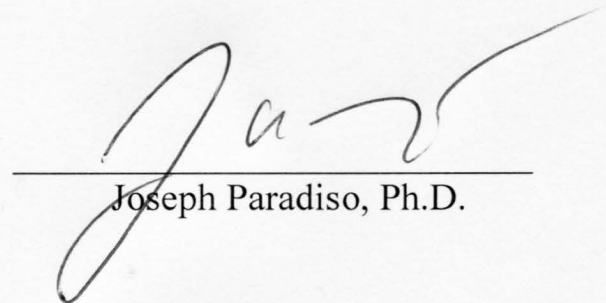
Declaration of Joseph Paradiso, Ph.D.,
In Support of *Inter Partes* Review of U.S. Patent No. 10,438,421

XVII. DECLARATION

In signing this declaration, I understand that this declaration will be filed as evidence in a contested case before the Patent Trial and Appellate Board of the USPTO.

I am aware that willfully false statements and the like made by me in connection with this declaration are punishable by fine or imprisonment, or both (18 U.S.C. § 1001) and may jeopardize the validity of the Petition. All statements herein made by me of my own knowledge are true and all statements made on information and belief are believed to be true. I declare under penalty of perjury that the foregoing is true and correct.

Executed this 18th day of January, 2023 at Medford, MA.



Joseph Paradiso, Ph.D.