

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner,

v.

RAFQA STAR, LLC,

Patent Owner.

Case No. IPR2023-00812
U.S. Patent No. 11,145,215

DECLARATION OF DAVID H. WILLIAMS

TABLE OF CONTENTS

I.	INTRODUCTION	14
II.	SUMMARY OF OPINIONS	16
III.	QUALIFICATIONS AND BACKGROUND	16
IV.	MATERIALS CONSIDERED	27
V.	LEGAL STANDARDS	29
A.	Level of Ordinary Skill	30
B.	Prior Art.....	31
C.	Anticipation	31
D.	Obviousness.....	31
VI.	THE '215 PATENT	36
A.	Alleged Invention of the '215 Patent	36
B.	Prosecution History	38
C.	Claim Construction	40
VII.	LEVEL OF ORDINARY SKILL IN THE ART	41
VIII.	THE PRIOR ART	42
A.	Waldman (U.S. Patent Application Publication No. 2011/0199479).....	43
B.	Kankainen (U.S. Patent Application Publication No. 2011/0141141).....	45
C.	Ohnishi (U.S. Patent Application Publication No. 2006/0190168).....	47
D.	Geelen (U.S. Patent Application Publication No. 2009/0125234).....	48

E.	Waldman, Kankainen, Ohnishi, and Geelen Are Analogous Art to the '215 Patent.....	49
IX.	GROUND OF UNPATENTABILITY.....	50
X.	THE CHALLENGED CLAIMS ARE UNPATENTABLE BASED ON THE PRIOR ART	50
A.	Ground 1: Waldman and Kankainen Render Obvious Claims 1-11 and 14-22.....	51
1.	Independent Claim 1	51
a.	[1Preamble] “A method, comprising:”	51
b.	[1a] “detecting a movement of a portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”	51
i.	Obviousness over Waldman.....	53
(a)	Motivation to Combine	54
(b)	Expectation of Success	55
ii.	Obviousness over Waldman in combination with Kankainen.....	57
(a)	Motivation to Combine	58
(b)	Expectation of Success	59
c.	[1b] “receiving video data captured in a first direction by a video capture device during the movement,”	59
d.	[1c] “where a first object is in a second direction;”	62
e.	[1d] “and presenting a video by a display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”	64

2.	[Claim 2] “The method of claim 1 wherein information is integrated with the video, the information for directing an attention of the user to the first object.”	68
3.	[Claim 3] “The method of claim 1 wherein information is integrated with the video, the information for instructing the user to direct an attention to the first object.”	71
4.	[Claim 4] “The method of claim 1 wherein information is integrated with the video, the information indicating a location of the first object.”	73
5.	[Claim 5] “The method of claim 1 wherein information is integrated with the video, the information including directional information indicating directions to the first object.”	75
6.	[Claim 6] “The method of claim 1 wherein indicia is integrated with the video, the indicia including directional information indicating directions to the first object.”	77
7.	[Claim 7] “The method of claim 1 wherein indicia is integrated with the video, the indicia indicating directions to the first object, where a location of the indicia on the display device of the portable electronic device is based on a relative position between the first object and the portable electronic device.”	78
8.	[Claim 8] “The method of claim 1 wherein first indicia and second indicia are integrated with the video, the first indicia indicating directions to the first object, the second indicia indicating a distance to the first object.”	80
9.	[Claim 9] “The method of claim 8 wherein the first indicia and the second indicia are updated based on the movement of the device.”	82
a.	Motivation to Combine	84
b.	Expectation of Success	84

10.	[Claim 10] “The method of claim 8 wherein the first indicia includes a direction indicator.”	85
11.	[Claim 11] “The method of claim 8 wherein the first indicia includes a label.”	86
12.	[Claim 14] “The method of claim 1 wherein the video includes data reflecting a video capture of surroundings of the first object.”	86
13.	[Claim 15] “The method of claim 1 wherein the first object includes a location.”	88
14.	[Claim 16] “The method of claim 1 and further comprising: detecting a change in the movement of the portable electronic device; in response to detecting the change in the movement of the portable device, updating the presentation of the video by the display device of the portable electronic device.”	89
15.	[Claim 17] “The method of claim 1 wherein the video is conditionally presented by the display device of the portable electronic device, based on a detected position of the portable electronic device.”	90
16.	[Claim 20] “The method of claim 1 wherein the user is directed in the second direction towards the first object which is not initially presented in the video, so that the user is directed to walk in the second direction for directing an attention of the user to the first object.”	91
17.	[Claim 21]	93
a.	[21Preamble] “The method of claim 1 and further comprising:”	93
b.	[21a] “detecting additional movement of the portable electronic device in the second direction, that results from the user walking with the portable electronic device in the second direction;”	93

c.	[21b] “receiving additional video data, that includes the first object, captured by the video capture device during the additional movement of the portable electronic device in the second direction;”	94
i.	Motivation to Combine	96
ii.	Expectation of Success.....	96
d.	[21c] “and utilizing the additional video data, presenting additional video by the display device of the portable electronic device that is viewable to the user for directing an attention of the user in connection with the first object that is presented in the additional video.”	97
i.	Motivation to Combine	98
ii.	Expectation of Success.....	98
18.	[Claim 22] “The method of claim 1 wherein information is integrated with the video, the information being received via a data store including location information for objects with fixed locations.”	99
19.	Independent Claim 18	101
a.	[18Preamble] “A portable device, comprising:”	101
b.	[18a] “a display device;”	101
c.	[18b] “an input device;”	102
d.	[18c] “at least one non-transitory memory storing instructions;”	103
e.	[18d] “and one or more processors in communication with the display device, the input device, and the at least one non-transitory memory,”	104

f.	[18e] “wherein the one or more processors execute the instructions to cause the portable electronic device to:”	106
g.	[18f] “detect a movement of the portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”	106
h.	[18g] “receive video data captured in a first direction by a video capture device during the movement,”	106
i.	[18h] “where a first object is in a second direction;”	106
j.	[18i] “and present a video by the display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”	107
20.	Independent Claim 19	107
a.	[19Preamble] “A non-transitory computer-readable media storing computer instructions that, when executed by one or more processors of a portable electronic device, cause the portable electronic device to:”	107
b.	[19a] “detect movement of the portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”	107
c.	[19b] “receive video data captured in a first direction by a video capture device during the movement,”	108
d.	[19c] “where a first object is in a second direction;”	108

e.	[19d] “and present a video by a display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”	108
B.	Ground 2: Waldman and Kankainen, and Further in View of Ohnishi, Render Obvious Claims 12 and 13	108
1.	[Claim 12] “The method of claim 1 wherein tactile feedback is output simultaneously with the presentation [of] the video, the tactile feedback being output based on a location of the first object.”	108
a.	Motivation to Combine.....	109
b.	Expectation of Success	110
2.	[Claim 13] “The method of claim 1 wherein tactile feedback is output simultaneously with the presentation [of] the video, the tactile feedback being output based on a movement of the portable electronic device.”	111
C.	Ground 3: Kankainen Discloses or Renders Obvious Claims 1-7 and 14-22.....	112
1.	Independent Claim 1	112
a.	[1Preamble] “A method, comprising:”	112
b.	[1a] “detecting a movement of a portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”	112
c.	[1b] “receiving video data captured in a first direction by a video capture device during the movement,”	115
d.	[1c] “where a first object is in a second direction;”	119
e.	[1d] “and presenting a video by a display device of the portable electronic device that is viewable to	

	the user for directing the user in a second direction towards the first object.”.....	123
2.	[Claim 2] “The method of claim 1 wherein information is integrated with the video, the information for directing an attention of the user to the first object.”.....	128
3.	[Claim 3] “The method of claim 1 wherein information is integrated with the video, the information for instructing the user to direct an attention to the first object.”.....	130
4.	[Claim 4] “The method of claim 1 wherein information is integrated with the video, the information indicating a location of the first object.”	132
5.	[Claim 5] “The method of claim 1 wherein information is integrated with the video, the information including directional information indicating directions to the first object.”	133
6.	[Claim 6] “The method of claim 1 wherein indicia is integrated with the video, the indicia including directional information indicating directions to the first object.”	134
7.	[Claim 7] “The method of claim 1 wherein indicia is integrated with the video, the indicia indicating directions to the first object, where a location of the indicia on the display device of the portable electronic device is based on a relative position between the first object and the portable electronic device.”	135
8.	[Claim 14] “The method of claim 1 wherein the video includes data reflecting a video capture of surroundings of the first object.”	137
9.	[Claim 15] “The method of claim 1 wherein the first object includes a location.”	138
10.	[Claim 16] “The method of claim 1 and further comprising: detecting a change in the movement of the portable electronic device; in response to detecting the	

	change in the movement of the portable device, updating the presentation of the video by the display device of the portable electronic device.”	139
11.	[Claim 17] “The method of claim 1 wherein the video is conditionally presented by the display device of the portable electronic device, based on a detected position of the portable electronic device.”	141
12.	[Claim 20] “The method of claim 1 wherein the user is directed in the second direction towards the first object which is not initially presented in the video, so that the user is directed to walk in the second direction for directing an attention of the user to the first object.”	143
13.	[Claim 21]	144
a.	[21Preamble] “The method of claim 1 and further comprising:”	144
b.	[21a] “detecting additional movement of the portable electronic device in the second direction, that results from the user walking with the portable electronic device in the second direction;”	144
c.	[21b] “receiving additional video data, that includes the first object, captured by the video capture device during the additional movement of the portable electronic device in the second direction;”	145
d.	[21c] “and utilizing the additional video data, presenting additional video by the display device of the portable electronic device that is viewable to the user for directing an attention of the user in connection with the first object that is presented in the additional video.”	146
14.	[Claim 22] “The method of claim 1 wherein information is integrated with the video, the information being received via a data store including location information for objects with fixed locations.”	147

15.	Independent Claim 18	147
a.	[18Preamble] “A portable electronic device, comprising:”	148
b.	[18a] “a display device;”	148
c.	[18b] “an input device;”	148
d.	[18c] “at least one non-transitory memory storing instructions;”	148
e.	[18d] “and one or more processors in communication with the display device, the input device, and the at least one non-transitory memory,”	149
f.	[18e] “wherein the one or more processors execute the instructions to cause the portable electronic device to:”	150
g.	[18f] “detect a movement of the portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”	151
h.	[18g] “receive video data captured in a first direction by a video capture device during the movement,”	151
i.	[18h] “where a first object is in a second direction;”	151
j.	[18i] “and present a video by the display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”	151
16.	Independent Claim 19	151
a.	[19Preamble] “A non-transitory computer-readable media storing computer instructions that, when executed by one or more processors of a portable	

	electronic device, cause the portable electronic device to:”	152
b.	[19a] “detect movement of the portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”	152
c.	[19b] “receive video data captured in a first direction by a video capture device during the movement,”	152
d.	[19c] “where a first object is in a second direction;”	153
e.	[19d] “and present a video by the display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”	153
D.	Ground 4: Kankainen and Geelen Render Obvious Claims 8-11	153
1.	[Claim 8] “The method of claim 1 wherein first indicia and second indicia are integrated with the video, the first indicia indicating directions to the first object, the second indicia indicating a distance to the first object.”	153
a.	Motivation to Combine	156
b.	Expectation of Success	157
2.	[Claim 9] “The method of claim 8 wherein the first indicia and the second indicia are updated based on the movement of the device.”	158
3.	[Claim 10] “The method of claim 8 wherein the first indicia includes a direction indicator.”	160
4.	[Claim 11] “The method of claim 8 wherein the first indicia includes a label.”	161
E.	Ground 5: Kankainen and Ohnishi Render Obvious Claims 12 and 13	161

1.	[Claim 12] “The method of claim 1 wherein tactile feedback is output simultaneously with the presentation [of] the video, the tactile feedback being output based on a location of the first object.”	161
a.	Motivation to Combine.....	162
b.	Expectation of Success	162
2.	[Claim 13] “The method of claim 1 wherein tactile feedback is output simultaneously with the presentation [of] the video, the tactile feedback being output based on a movement of the portable electronic device.”	163
XI.	CONCLUSION.....	163

I. INTRODUCTION

1. I have been retained by Google LLC (“Petitioner”) as an independent expert consultant in this proceeding before the Patent Trial and Appeal Board of the United States Patent and Trademark Office.

2. I am over 21 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein.

3. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of any proceeding.

4. I understand that this proceeding involves U.S. Patent No. 11,145,215 (“the ’215 patent,” Ex. 1001). The application for the ’215 patent was filed February 28, 2020, as U.S. Patent Application No. 16/805,677 (“the ’677 application”). The ’215 patent claims priority as a continuation-in-part of U.S. Patent Application Ser. No. 16/574,026, filed September 17, 2019, titled “METHODS, SYSTEMS, AND COMPUTER PROGRAM PRODUCTS FOR PROVIDING FEEDBACK TO A USER IN MOTION,” which is a continuation of U.S. Patent Application Ser. No. 15/921,636, filed March 14, 2018, titled “METHODS, SYSTEMS, AND COMPUTER PROGRAM PRODUCTS FOR PROVIDING FEEDBACK TO A USER IN MOTION” (now abandoned), which is a continuation-in-part of U.S. Patent Application Ser. No. 15/595,906, filed May

15, 2017, titled “METHODS, SYSTEMS, AND COMPUTER PROGRAM PRODUCTS FOR PROVIDING FEEDBACK TO A USER IN MOTION” (now abandoned), which is a continuation-in-part of U.S. Patent Application Ser. No. 14/195,832, filed March 3, 2014, titled “METHODS, SYSTEMS, AND COMPUTER PROGRAM PRODUCTS FOR PROVIDING STEERING-CONTROL FEEDBACK TO AN OPERATOR OF AN AUTOMOTIVE VEHICLE” (now abandoned), which is a continuation-in-part of U.S. Patent Application Ser. No. 13/045,556, filed on March 11, 2011, titled “METHODS, SYSTEMS, AND COMPUTER PROGRAM PRODUCTS FOR PROVIDING FEEDBACK TO A USER OF A PORTABLE ELECTRONIC DEVICE IN MOTION” (now abandoned).” Ex. 1001, code (63). The ’215 patent also claims priority to Provisional Application No. 62/642,581, filed March 13, 2018. Ex. 1001, code (60).

5. I have been asked by Petitioner to provide my opinion on whether the claims of the ’215 patent would have been obvious to a person of ordinary skill in the art at the time of the earliest claimed priority date of the ’215 patent. In performing my analysis, I have been asked to assume that the priority date is March 11, 2011. My opinions are set forth below.

6. Throughout this declaration, I refer to specific pages, figures, and/or line numbers of various exhibits. These citations are illustrative and are not

intended to suggest that they are the only support for the propositions for which they are cited.

II. SUMMARY OF OPINIONS

7. This declaration considers claims 1-22 of the '215 patent. Below, I set forth the opinions I have formed, the conclusions I have reached, and the bases for these opinions and conclusions. I believe the statements contained in this declaration to be true and correct to the best of my knowledge.

8. Based on my experience and knowledge of the art at the time of the applicable priority date (I was told to assume a priority date of March 11, 2011), it is my opinion that claims 1-22 of the '215 patent would have been obvious based on the asserted grounds discussed below.

9. I am being compensated for my time at my normal hourly rate. My compensation is in no way contingent upon the nature of my findings, the presentation of my findings in testimony, or the outcome of this proceeding.

III. QUALIFICATIONS AND BACKGROUND

10. I believe that I am well qualified to serve as a technical expert in this matter based upon my qualifications, discussed in detail below. A copy of my curriculum vitae is included as Exhibit 1004.

11. I am competent to write this declaration.

12. In formulating my opinions, I have relied upon my training, knowledge, and experience in the relevant art. A copy of my current curriculum vitae is provided as Exhibit 1004, and it provides a comprehensive description of my academic and employment history.

13. I have over 30 years of experience related to wireless location services, including experience designing, implementing, and managing numerous location-based service (“LBS”) applications, such as navigation, mobile social networking, family tracking, and worker and asset tracking management, as well as working in all fields within the location services ecosystem, including all forms of location determination technologies, map data, handset technologies, user interfaces, and associated information technology systems, including identification, authentication, privacy, security, and other related capabilities, such as network engineering and operations.

14. I am currently the President of the company E911-LBS Consulting, and I have been with the company since 2002. As the President of E911-LBS Consulting, I provide services across the entire wireless value chain, particularly with respect to technology and business strategic planning and product design and development associated with LBS, Global Positioning Satellite (“GPS”) systems, E911, WiFi-based and other medium/long-range Real-Time Location Systems (“RTLS”), Radio Frequency Identification (“RFID”), Bluetooth, Near Field

Communications (“NFC”), and beacon-based and other short-range communications/location systems, and other location determination and sensing technologies and services.

15. I have extensive expertise in all aspects of LBS delivery across the wireless location ecosystem, including enabling network, map data, geospatial platform, chipset, data management, device, user interface, and location determination infrastructure and integration providers. I am an expert in all related aspects of LBS, including delivery/visualization of location information, and key associated enablers of such device hardware and software design.

16. For example, in the 1983-1985 timeframe, I was a microprocessor system design engineer on the digitization project of the F-15 fighter jet radar system. Specifically, I designed a system for converting analog signals (radar pings, sensor measurements, etc.) to digital form and for feeding the converted signals to various parties and subsystems, including pilots and their Heads-Up Display (“HUD”) interfaces. The converted signals corresponded to data relating to navigational and directional information, aircraft status, the location of other aircrafts/targets relative to the pilot’s position, and associated images. In practice, the HUD interface was integrated with the pilot’s helmet or with a screen facing the pilot, and allowed the pilot to look at and through the data integrated in the interface without requiring them to look down at their instrument panel.

17. In the 1995-2000 timeframe, as an Associate Partner in the Communications & High Technology Practice of Accenture (one of the world's leading technology companies), I focused on using wireless location technologies to provide services to the public sector and commercial markets. From 1998 to 2000, I led the development of the LBS product/technology strategy and roadmap for Nextel Communications, Inc. (later acquired by Sprint, and now part of T-Mobile). My work with Nextel resulted in some of the earliest LBS applications in the U.S. market and included extensive research into the potential use of various technologies in providing and enabling a wide array of location-based services. Many of the Nextel products selected for development and implementation included various forms of worker and asset tracking that matched—based on their location—workers with other workers, or workers with assets (e.g., field equipment, vehicles, etc.), tracked worker/asset locations on a map, and provided navigation directions from one point to another. My work developing the product concept and initial requirements sets heavily emphasized the user interface layout and design for those applications, drawing on extensive feedback obtained using customer focus groups. My work also included leading the development of the underlying network and information technology architectures that would be required to support the LBS applications' product strategy and roadmap.

18. In 2003, I led the development of part of AT&T Wireless's E911 infrastructure, including the development of systems, processes, and reporting infrastructure to manage and track the deployment of time difference of arrival-based location determination technologies. I managed the testing and Federal Communications Commission reporting of network location inaccuracies, with a particular focus on detecting and troubleshooting out-of-norm technology deployment and inaccurate location conditions. This work also generated the accuracy data associated with determining the location of a portable electronic device that could then be used as supplemental information (e.g., how accurate the location was) to location-based applications, such as navigation, point-of-interest ("POI") information, or people-finding services.

19. From 2005 to 2007, I worked with NAVTEQ (now called HERE)—the leading provider of map data and services essential to creating LBS applications—to develop the company's web developer website content and tools. Specifically, I designed and managed the site map and overall content, including the development of comprehensive technical and business web content for all NAVTEQ map product and service lines. Through the developer site, application developers and business managers became intimately familiar with map data, Geographical Information System ("GIS") platforms, and location-based services and associated user interface and associated data population options available to

successfully develop and launch their LBS applications. For example, I developed content for highlighting key types of map data and for providing technical details on how NAVTEQ tools could be used in LBS design for various consumer and business applications, for example, data product packages focused on consumer POIs, such as restaurants and entertainment spots, which could be used by social-oriented application developers for portraying mutually common data sets across different types of mobile device screens, and navigation packages focused on different levels of navigation granularity (e.g., highways vs. backroads vs. trails) and modes of transportation (e.g., truck, car, bike, pedestrian) across many forms of user interface platforms (phones, PDAs, laptops, desktop monitors, Personal Navigation Devices, etc.).

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

corporate-wide location data privacy policies and associated system implementation for all LBS customers.

21. This work required finalizing the design, and in some cases creating the design, for how the customers/users would interact with the application. For example, nearly all the applications had a “thick” client on the phone that would do much of the data collection, processing, and reporting/displaying to the user via the phone interface. Each of these “thick” client applications had to be customized to fit with the technical limitations of the phone, including screen size, resolution, display capabilities, and user input interfaces. Since, for some applications, this required customizing the app across 40 or more phone/device platforms, the user interface portion of the design could be very critical to customer and market success. The app had to work within the constraints and capabilities of the phone/device platform, and also within the constraints and capabilities of the rest of the AT&T IT, network, and operational architecture and processes.

22. For example, my work in AT&T’s implementation of mobile social networking focused on finalizing the design of the Loopt social networking application, an app being adapted into AT&T’s network and product line. This role and work required extensive knowledge of how the app worked (including its use of location data-sharing mechanisms and associated capabilities such as geofences). The role required user interface design modifications to ensure

successful implementation across multiple users/friends using different device platforms (and thus differing screen and functional capabilities) so that the friends' shared user experience was as accurate and complete as possible, enabled indications when friends were nearby or at a certain POI, and provided directions for enabling the friends/users to meet. Further, the application had to be tied into (and be used by) AT&T's network, AT&T's location infrastructure, and various AT&T IT systems used for functions including Sales, Customer Care, Fulfillment, Billing/Accounts Receivable, and various network and IT operations. The work also included extensive work with AT&T Legal to develop and implement AT&T's location privacy and data security policies. The integration of the application into the above required extensive authorization-related design work to ensure that a given user could appropriately access the various AT&T systems and subsystems, as well as the application, under the appropriate conditions/circumstances, including appropriately authorizing the use of and the sharing of a user's location with other users and/or systems. This work in location-related data security and privacy networking resulted in a patent: U.S. Patent No. 8,613,109, titled "Method and Apparatus for Providing Mobile Social Networking Privacy," that issued on December 17, 2013, of which I was the only nonemployee inventor.

23. Much of this above-detailed work was replicated in various forms for other LBS applications for which I was the Lead Product Realization Manager, including AT&T FamilyMap (tracking and controlled sharing of family/children location information), Slifter Local Search, 411-with-LBS, AT&T Navigator, and Telenav Mobile Resource Management and Asset Management products. I also served as the Lead Product Realization Manager for an early LBS-based golfing game system (called CaddyHawk), which used location-based services to track and improve a golfer's game based on their position on the course relative to the hole and/or other obstacles/constraints on the golf course. This game continuously updated the user's location and walking direction relative to the location of the ball and the location of the hole, to provide contextual information and recommendations to the user on their device screen. For example, the game might use the information to tell the user that they are on the fairway, 150 yards over water to the hole, with the wind blowing from the right at 10 mph; and recommend that the user use an 8-iron and aim 20 yards right of the hole. I also managed several fleet management applications/systems for various AT&T business segments, with a variety of associated display/user interface capabilities as well as various ties into other vehicle subsystems and sensors, with various monitoring/reporting user interfaces.

24. In addition to the Location-Based Services applications, enabling location technologies, wireless communications, and privacy and security experience and expertise described above, I also have many years of information technology experience. For example, as a consultant in the information technology practices of Deloitte Consulting (originally Touche Ross), Booz Allen & Hamilton, and Andersen Consulting (now Accenture), I served in key technology development and technology leadership roles in numerous projects designing and implementing mainframe, mini-computer, and client-server based computing systems across a wide variety of industries and a wide variety of functions/applications.

25. I also led the design and development of a number of different communications networks associated with the above computing systems, including wide- and local-area networks, utilizing both wired and wireless technologies, involving private and public (e.g., Internet-based) communications backbones. This communications systems expertise extends back to the early 1980s with my Electrical Engineering degree from Purdue University in 1983 and my work as an electrical engineer in the design of the Analog-to-Digital Signal Converter unit for the F-15 fighter jet radar system while with Hughes Aircraft Company Radar Systems Division from 1983 to 1985. This work involved interfacing with

numerous sensor-intensive subsystems as well as various ground, sea, and air communications and control systems.

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

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

27. I am the primary/sole inventor of several patents extensively establishing, tracking, and utilizing support/social networks of people, places, and entities in supporting those attempting to control/modify/correct/improve various undesired activities and behaviors, such as those suffering from addiction or those in difficulty with the law on issues related to such behaviors, utilizing a wide array of sensor systems and networks to collect data and numerous visual/video and audio-based user interface mechanisms to present information to various users.

28. I have served/am serving as a mobile location forensics expert in over 50 criminal (homicide, arson, etc.) and civil (trade secrets, product liability, etc.) cases, many involving telematics and otherwise tracking of individual movements and associated behaviors possibly associated with the committing of a crime or

other infraction, utilizing a variety of data including location information, video/camera data, and various sensor-based data.

29. I have served/am serving as a mobile/wireless and location technology and application/system expert in patent matters involving over 150 patents, and have been deposed in such matters over 30 times. I have testified in court in ITC, the Eastern and Western Districts of Texas, and international (Canada, Trinidad and Tobago) venues, as well as various U.S. criminal courts.

30. I received a B.S. degree in Electrical Engineering from Purdue University in 1983 with top honors. I received an MBA degree in Information Systems Management from The University of Texas at Austin in 1987, also with top honors.

IV. MATERIALS CONSIDERED

31. In forming my opinions, I have reviewed the following documents, and any other document cited in this declaration.

Exhibit	Description
Ex. 1001	U.S. Patent No. 11,145,215 (“the ’215 patent”)
Ex. 1002	File History of U.S. Patent No. 11,145,215
Ex. 1005	U.S. Patent Application Publication No. 2011/0199479 to Waldman (“Waldman”)
Ex. 1006	U.S. Patent Application Publication No. 2011/0141141 to Kankainen (“Kankainen”)

Exhibit	Description
Ex. 1007	U.S. Patent Application Publication No. 2006/0190168 to Ohnishi et al. (“Ohnishi”)
Ex. 1008	U.S. Patent Application Publication No. 2010/0123737 to Williamson et al. (“Williamson”)
Ex. 1009	U.S. Patent Application Publication No. 2009/0125234 to Geelen et al. (“Geelen”)
Ex. 1010	U.S. Patent No. 8,698,843 to Tseng (“Tseng”)
Ex. 1011	U.S. Patent Application Publication No. 2010/0070173 to Sakamoto (“Sakamoto”)
Ex. 1012	U.S. Patent Application Publication No. 2006/0004512 to Herbst et al. (“Herbst”)
Ex. 1013	U.S. Patent Application Publication No. 2009/0216446 to Ma et al. (“Ma”)
Ex. 1014	Waldman As-filed U.S. Patent Application No. 12/705,558

32. I have also relied on my education, experience, research, training, and knowledge in the relevant art, and my understanding of any applicable legal principles described in this declaration.

33. All of the opinions contained in this declaration are based on the documents I reviewed and my knowledge and professional judgment. My opinions have also been guided by my understanding of how a person of ordinary skill in the art would have understood the claims of the '215 patent at the time of the earliest claimed priority date.

34. I reserve the right to supplement and amend any of my opinions in this declaration based on documents, testimony, and other information that becomes available to me after the date of this declaration.

V. LEGAL STANDARDS

35. I am not a lawyer. My understanding of the legal standards to apply in reaching the conclusions in this declaration is based on discussions with counsel for Petitioner, my experience applying similar standards in other patent-related matters, and my reading of the documents submitted in this proceeding. In preparing this declaration, I have tried to faithfully apply these legal standards to the challenged claims.

36. I have been informed that there are two ways in which prior art may render a patent claim unpatentable. First, I have been informed that the prior art can “anticipate” a claim. Second, I have been informed that the prior art can render a claim “obvious” to a person of ordinary skill in the art. I understand that a claim is patentable if it was not anticipated and would not have been obvious by the prior art at the effective filing date of the patent.

37. I have been informed that a dependent claim is a patent claim that refers back to another patent claim. I have been informed that a dependent claim includes all of the limitations of the claim to which it refers.

38. I have been asked to provide my opinions as to whether the cited prior art discloses or renders obvious claims 1-22 of the '215 patent from the perspective of a person of ordinary skill in the art at the '215 patent's earliest claimed priority date in 2011, as described in more detail below.

39. I have been informed that in *inter partes* review proceedings, such as this one, the party challenging the patent bears the burden of proving unpatentability by a preponderance of the evidence. I understand that a preponderance of the evidence means "more likely than not."

40. For purposes of this declaration, I have been asked to provide my opinions on issues regarding unpatentability. I have been informed of the following legal standards, which I have applied in forming my opinions.

A. Level of Ordinary Skill

41. I have been informed that a person of ordinary skill in the art is determined by considering several factors, including the (i) type of problems encountered in the art; (ii) prior art solutions to those problems; (iii) rapidity with which innovations are made; (iv) sophistication of the technology; and (v) educational level of active workers in the field.

42. I have been instructed to assume that a person of ordinary skill in the art is not a specific real individual, but rather a hypothetical individual having the qualities reflected by the factors discussed above.

B. Prior Art

43. I have been advised and understand that the information used to evaluate whether an invention was new and not obvious when made is generally referred to as “prior art.” I understand that prior art includes patents and printed publications that existed before the earliest claimed priority date or the earliest filing date of the patent (which I have been informed is also called the “effective filing date”). I have been informed and understand that a patent or published patent application is prior art if it was filed before the earliest filing date of the claimed invention and that a printed publication is prior art if it was publicly available before the earliest filing date.

C. Anticipation

44. I have been informed that under 35 U.S.C. § 102, a patent claim is unpatentable for anticipation if the claimed subject matter was patented or described in a printed publication before the effective filing date of the claimed invention. I have been informed that this is referred to as unpatentability by anticipation. I have been informed that a patent claim is anticipated under § 102 if a single prior art reference discloses all the limitations of the claimed invention.

D. Obviousness

45. I have been informed that for obviousness under 35 U.S.C. § 103, a patent claim is unpatentable if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have

been obvious to a person having ordinary skill in the art to which said subject matter pertains at the time the invention was made. I have been informed that this is referred to as unpatentability by obviousness.

46. I have been informed that an obviousness analysis includes the following considerations:

- a. Determining the scope and content of the prior art;
- b. Ascertaining the differences between the prior art and the claims at issue;
- c. Resolving the level of ordinary skill in the pertinent art; and
- d. Considering evidence of secondary indicia of nonobviousness (if available).

47. I have been informed that the relevant time for considering whether a claim would have been obvious to a person of ordinary skill in the art is the time of invention. For my obviousness analysis, counsel for Petitioner instructed me to assume that the date of invention for the challenged claims is March 11, 2011. My opinions would not change if I assumed another, e.g., later, date of invention.

48. I have been informed that a reference may be modified or combined with other references or with a person of ordinary skill in the art's own knowledge if the person would have found the modification or combination obvious. I have also been informed that a person of ordinary skill in the art is presumed to know all

the relevant prior art, and the obviousness analysis may take into account the inferences and creative steps that a person of ordinary skill in the art would employ.

49. I have been informed that whether a prior art reference renders a patent claim obvious is determined from the perspective of a person of ordinary skill in the art. I have also been informed that, while there is no requirement that the prior art contain an express suggestion to combine known elements to achieve the claimed invention, and while a suggestion to combine known elements to achieve the claimed invention may come from the prior art as a whole or individually and may consider the inferences and creative steps a person of ordinary skill in the art would employ, as filtered through the knowledge of one skilled in the art, obviousness grounds cannot be sustained by mere conclusory statements and must include some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.

50. In determining whether a prior art reference could have been combined with another prior art reference or other information known to a person having ordinary skill in the art, I have been informed that the following principles may be considered:

- a. A combination of familiar elements according to known methods is likely to be obvious if it yields predictable results;

- b. The substitution of one known element for another is likely to be obvious if it yields predictable results;
- c. The use of a known technique to improve similar items or methods in the same way is likely to be obvious if it yields predictable results;
- d. The application of a known technique to a prior art reference that is ready for improvement to yield predictable results;
- e. Any need or problem known in the field and addressed by the reference can provide a reason for combining the elements in the manner claimed;
- f. A person of ordinary skill often will be able to fit the teachings of multiple references together like a puzzle; and
- g. The proper analysis of obviousness requires a determination of whether a person of ordinary skill in the art would have a “reasonable expectation of success”—but not “absolute predictability” of success—in achieving the claimed invention by combining prior art references.

51. I have been informed that, when a work is available in one field, design alternatives and other market forces can prompt variations of it, either in the same field or in another. I have been informed that if a person of ordinary skill in the art could have implemented a predictable variation and would have seen the

benefit of doing so, that variation is likely to have been obvious. I have been informed that, in many fields, there may be little discussion of obvious combinations, and in these fields, market demand—not scientific literature—may drive design trends. I have been informed that, when there was a design need or market pressure and there are a finite number of predictable solutions, a person of ordinary skill in the art would have had a good reason to pursue those known options.

52. I have been informed that the law permits the application of “common sense” in examining whether a claimed invention would have been obvious to a person skilled in the art. For example, I have been informed that combining familiar elements according to known methods and in a predictable way may suggest obviousness when such a combination would yield nothing more than predictable results. I understand, however, that a claim is not obvious merely because every claim element is disclosed in the prior art, and that a party asserting obviousness must still provide a specific motivation to combine or modify the references as recited in the claims and explain why one skilled in the art would have reasonably expected to succeed in doing so.

53. I have been informed that there is no rigid rule that a reference or combination of references must contain a “teaching, suggestion, or motivation” to combine references. But I also understand that the “teaching, suggestion, or

motivation” test can be a useful guide in establishing a rationale for combining elements of the prior art. I have been informed that this test poses the question as to whether there is an express or implied teaching, suggestion, or motivation to combine prior art elements in a way that realizes the claimed invention, and that it seeks to counter impermissible hindsight analysis.

54. I am not aware of any evidence of secondary considerations that would support a determination of nonobviousness of the claimed subject matter in the '215 patent.

55. I have been informed that, in an obviousness analysis, prior art must be analogous prior art to the patent being considered. I have been informed that a prior art reference is considered to be analogous, or in the same field of art, if the reference is either (1) in the same field of endeavor as the challenged patent, regardless of the problems the challenged patent and the prior art address, or (2) reasonably pertinent to the particular problem being solved by the challenged patent.

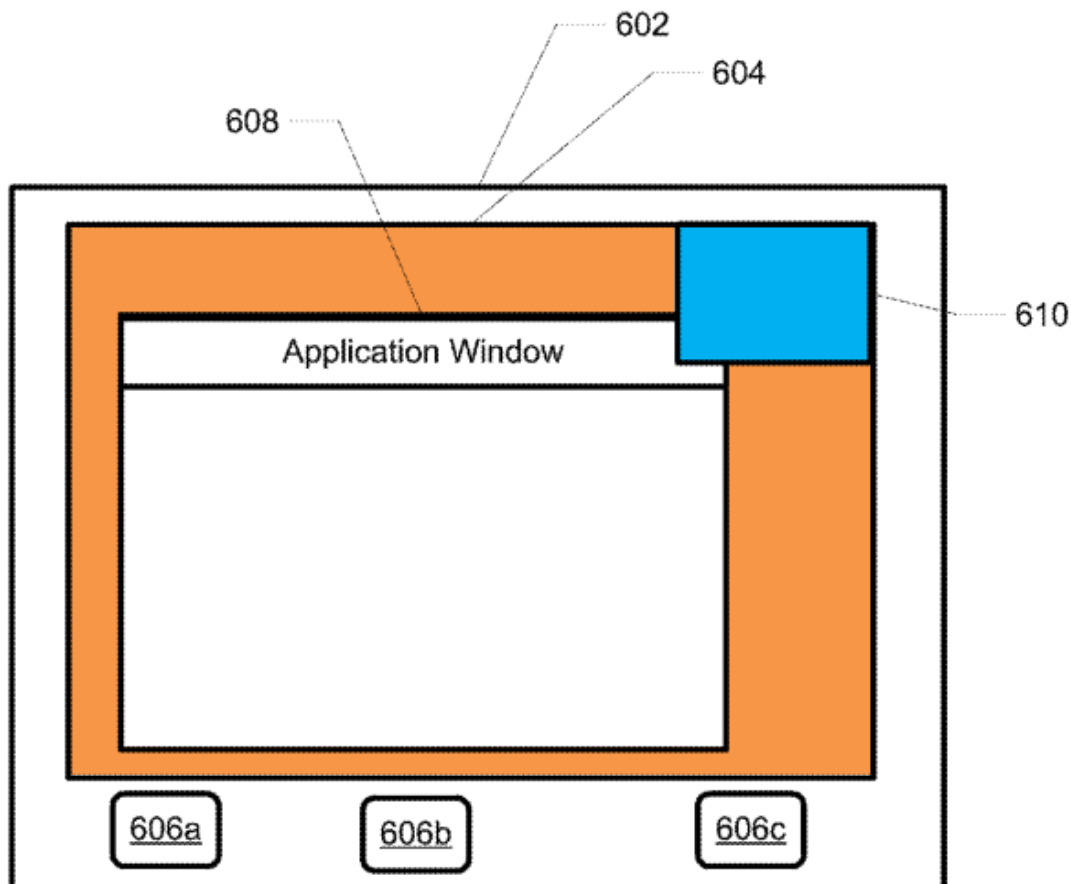
VI. THE '215 PATENT

A. Alleged Invention of the '215 Patent

56. The '215 patent describes methods for directing a user to a first object, such as a point of interest (“POI”), using a portable electronic device (“PED”). Ex. 1001, 2:20-26. The method detects the PED’s movement, receives

visual input using a “video capture device[],” and augments a video output to include an “attention output,” which is a coined phrase for a conventional annotation. Ex. 1001, 12:26-31, 12:54-62, 25:2-26, 27:57-59, 28:59-61, 29:37-39, FIG. 2.

57. Figure 6 shows a screen (“presentation space 604”) (orange) displaying the video (“application window 608”) (white) and annotation (“[a]ttention output 610”) (blue) directing the user “to look up and to the right.” Ex. 1001, 28:42-50, 29:1-6, 29:31-37, FIG. 6.



Ex. 1001, FIG. 6 (annotated).

B. Prosecution History

58. The '215 patent was filed on February 28, 2020, and claims priority to a chain of applications and a provisional application, as discussed above. *Supra* ¶ 4. During prosecution, the applicant appealed the Examiner's rejection of pending claims 1-13 and 15-18 under 35 U.S.C. § 112(b); pending claims 1-13 and 15-23 under 35 U.S.C. § 112(a); and pending claims 1-13 and 15-22 under 35 U.S.C. § 103 "as being unpatentable over Harada et al. (US 2013/0029730)." Ex. 1002, 346-363.

59. Applicant "clarified¹ claim 1 to avoid" the § 112(b) rejection and refuted the § 112(a) and § 103 rejections, arguing that the claims were supported by "the earliest priority document, which is incorporated by reference," and that Harada was "not prior art" in light of the priority claim. Ex. 1002, 352-363. The Board reversed the Examiner and found that the claims were supported by the earlier-filed application and that Harada was not prior art. Ex. 1002, 417-420.

60. The Examiner subsequently allowed the claims in an *Ex parte Quayle* action. Ex. 1002, 422-433. In that same action, the Examiner also identified Geelen

¹ The Examiner entered applicant's after final amendment overcoming the rejection prior to the appeal. Ex. 1002, 328.

(U.S. Patent Application Publication No. 2012/0185165) as “prior art made of record and not relied upon” but “considered pertinent to applicant’s disclosure.” Ex. 1002, 423, 426. The Examiner explained that “Geelen has not been used to reject the claims in the application” because “[t]he Geelen reference does not particularly disclose the concept of detecting an object in motion relative to the portable electronic device.” Ex. 1002, 423-424 (also noting that “the Board stated that the claim term ‘directing the user in a second direction towards the first object’ had support in the specification at paragraph No. 134,” and determining that “[t]he only support referred to in paragraph No. 134 is an object detected to be in motion relative to the portable electronic device”).

61. In reply, the applicant argued that “[t]he specification includes support for stationary objects (e.g.,] ‘another object such as wall 512’), as well,” and that the claims “cover ... situations where the object is stationary (e.g.,] has a fixed location) and the portable electronic device is the only entity that moves, per the claimed ‘detecting a movement of a portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction.’” Ex. 1002, 442.

62. In the subsequent Notice of Allowance, the Examiner did “not dispute that the specification supports stationary objects,” but argued that “the specification is silent as to presenting a video by a display device of the portable

electronic device that is viewable to the user for directing the user in a second direction towards a wall, in which the wall is in a second direction with respect to a first direction of a video” Ex. 1002, 457.

C. Claim Construction

63. I have been instructed that the “intrinsic record” includes the ’215 patent itself, including the claims, description, and figures (Ex. 1001), and the ’215 patent’s prosecution history—which I understand is the record of proceedings at the U.S. Patent and Trademark Office (“Patent Office”) concerning the patent (Ex. 1002). I understand that, like the claims and written description, the prosecution history provides evidence to a person of ordinary skill in the art of how the inventor intended their patent to be understood, and how the Patent Office understood the patent. I understand that the inventor is permitted to apply a special definition to the terms or to limit the scope of claim terms in their patent claims, which may differ from the term’s plain and ordinary meaning. That special definition or limitation on scope may be provided in the patent’s written description, the patent’s prosecution history, or both.

64. I understand that claim interpretation may also be informed by “extrinsic evidence” (that is, evidence outside of the patent record itself). I have been informed that extrinsic evidence may include dictionaries, technical treatises,

and other materials evidencing the meaning of a claim term and the understanding held by a person of ordinary skill in the art in the relevant time period.

65. I have been asked for purposes of this declaration to apply the plain and ordinary meaning of the claim terms as they would have been understood by a person of ordinary skill in the art at the earliest claimed priority date of the '215 patent.

66. I understand that no claim term's construction is in dispute at this time. Based on my review of these materials and my personal knowledge and experience, I have considered each term of the '215 patent as it would have been understood by a person of ordinary skill in the art at the earliest claimed priority date of March 11, 2011.

VII. LEVEL OF ORDINARY SKILL IN THE ART

67. In rendering the opinions set forth in this declaration, I have been asked to consider the '215 patent's claims and the prior art through the eyes of a person of ordinary skill in the art (which I may also refer to as "one skilled in the art," "skilled artisan," "POSITA," or similar variation). I have considered factors such as the educational level and years of experience of those working in the pertinent art, the types of problems encountered in the art, the teachings of the prior art, patents and publications of other persons or companies, and the sophistication of the technology.

68. Taking the factors described in the Legal Standards – Level of Ordinary Skill section into consideration (*supra* § V.A), it is my opinion that a POSITA would have had at least a bachelor’s degree in electrical engineering, computer science, or related engineering disciplines, and at least two years of experience in navigation or location-based services and interfaces for their use. Relevant work experience can substitute for formal education and additional education could substitute for work experience.

69. I met the criteria for a POSITA at the earliest priority date of the ’215 patent.

VIII. THE PRIOR ART

70. In forming my opinions, I found the following prior art relevant when considering whether the claims of the ’215 patent would have been obvious to a person of ordinary skill in the art.

Ex. 1005	U.S. Patent Application Publication No. 2011/0199479 to Waldman (“Waldman”)
Ex. 1006	U.S. Patent Application Publication No. 2011/0141141 to Kankainen (“Kankainen”)
Ex. 1007	U.S. Patent Application Publication No. 2006/0190168 to Ohnishi et al. (“Ohnishi”)
Ex. 1008	U.S. Patent Application Publication No. 2010/0123737 to Williamson et al. (“Williamson”)
Ex. 1009	U.S. Patent Application Publication No. 2009/0125234 to Geelen et al. (“Geelen”)

Ex. 1010	U.S. Patent No. 8,698,843 to Tseng (“Tseng”)
Ex. 1011	U.S. Patent Application Publication No. 2010/0070173 to Sakamoto (“Sakamoto”)
Ex. 1012	U.S. Patent Application Publication No. 2006/0004512 to Herbst et al. (“Herbst”)
Ex. 1013	U.S. Patent Application Publication No. 2009/0216446 to Ma et al. (“Ma”)

71. As explained below, in my opinion, claims 1-22 of the '215 patent would have been obvious based on Waldman, Kankainen, Ohnishi, and Geelen, in the combinations discussed below.

A. Waldman (U.S. Patent Application Publication No. 2011/0199479)

72. Waldman published as U.S. Patent Application No. 2011/0199479 on August 18, 2011, and was filed February 12, 2010. I understand and have been asked to assume that Waldman is prior art to the '215 patent.

73. Waldman discloses a “method of augmenting a video stream of a [handheld communication] device’s present surrounding with navigational information.” Waldman, [0005], [0011], [0047]. “In practice, a user points a handheld communication device to capture and display a real-time video stream of a view.” Waldman, [0010]. The device “visually augments the captured video stream with data related to each point of interest” (“POI”) so the user can select a POI to visit, and the device “visually augments the captured video stream with a

directional map to a selected POI in response to the user input.” Waldman, [0010].

In an example, the user selects Buena Vista Park, and “in response,” the device “visually augment[s] the captured image 302 with a directional map 310 to the selected [POI]” to include “a direction 312 that the user must travel on Dolores St. to begin travelling to reach ‘Buena Vista Park’ [and] a turn 314 that the user must take, i.e., a turn left onto Duboce Ave. from Dolores St.” Waldman, [0031]. “As the user and associated device progress along a route, the overlaid directions can automatically update to show the updated path.” Waldman, [0007], [0052], claim 7.

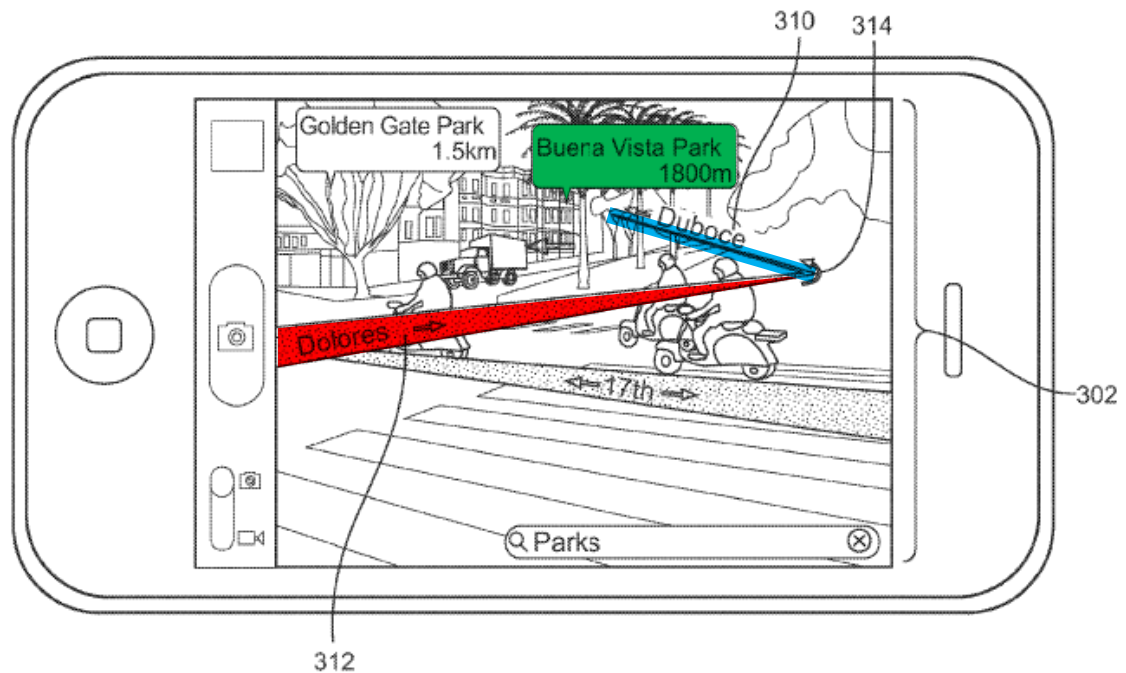


FIG. 3

Waldman, FIG. 3 (annotated).

B. Kankainen (U.S. Patent Application Publication No. 2011/0141141)

74. Kankainen published as U.S. Patent Application Publication No. 2011/0141141 on June 16, 2011, and was filed December 14, 2009. I understand and have been asked to assume that Kankainen is prior art to the '215 patent.

75. Kankainen utilizes “augmented reality or augmented virtuality (e.g., using 3D models and 3D mapping information) to insert rich content information relevant to...[a] POI...in [a] live image view in a real time manner.” Kankainen, [0039], [0075]. When the user requests walking directions to a POI, like the IMF building, “the system 100 retrieves location data (e.g., an address, GPS coordinates, etc.) of the IMF ... [and] then maps a route from the current location (e.g., the METRO Station) to the designated POI, and presents the route on a digital map to the user. While the user is walking along the route, the system 100 presents a live image view of the surrounding location on the screen.” Kankainen, [0034]. The method “utilizes the augmented reality or augmented virtuality (e.g., using 3D models and 3D mapping information) to insert rich content information relevant to the POI (e.g., drawn from the Internet) in the live image view in a real time manner,” including “turning points” for directing the user to the POI (examples shown in **green** below). Kankainen, [0039], [0073],

[0075], FIGS. 6C, 6D, 6H. The augmented stream is updated as the user walks along the route. Kankainen, [0075], [0077], [0080], FIGS. 6C, 6D, 6H.

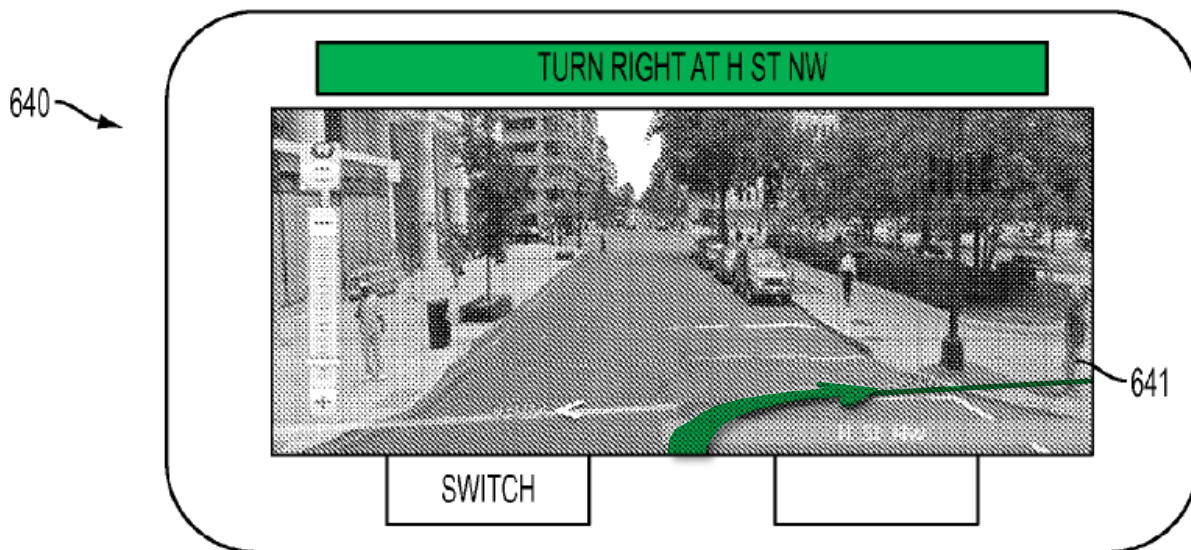


FIG. 6C

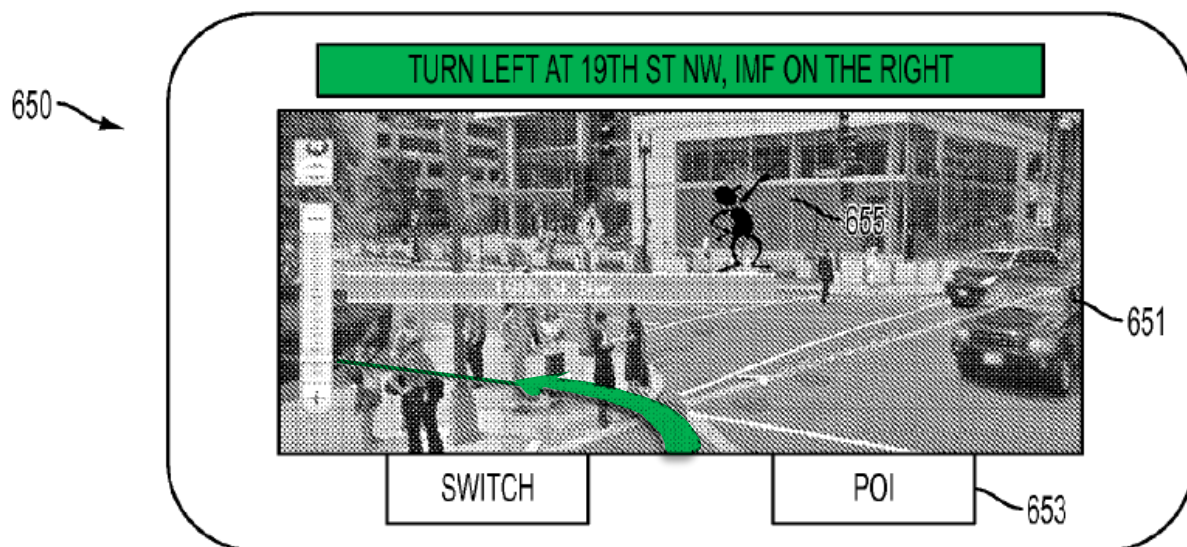


FIG. 6D

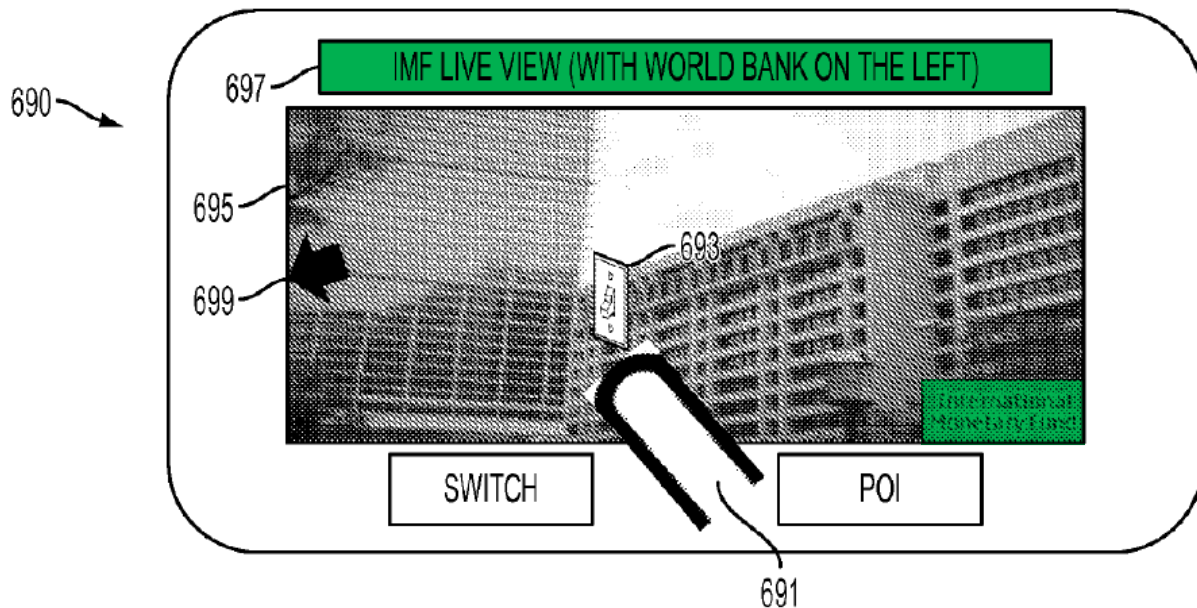


FIG. 6H

Kankainen, FIGS. 6C, 6D, 6H (annotated).

C. Ohnishi (U.S. Patent Application Publication No. 2006/0190168)

76. Ohnishi published on August 24, 2006, as U.S. Patent Application Publication No. 2006/0190168. I understand and have been asked to assume that Ohnishi is prior art to the '215 patent.

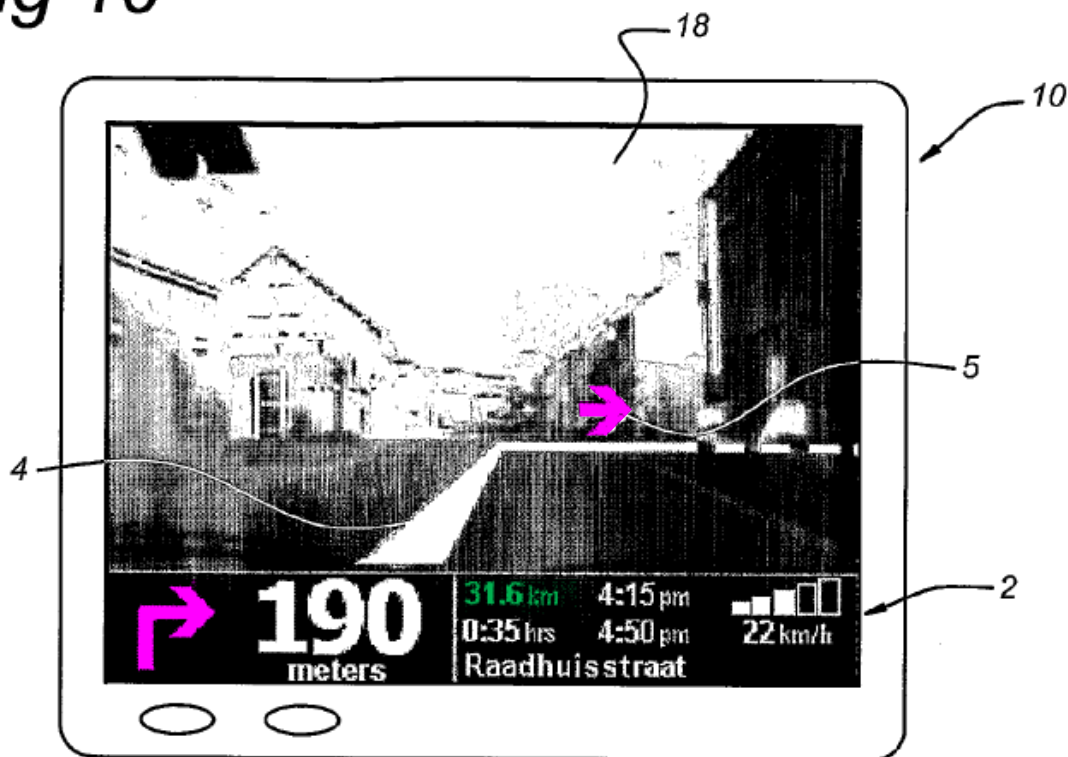
77. Ohnishi discloses a pedestrian navigation device that provides tactile feedback, for example, a “vibrational pattern,” as the user approaches a “guide point” along the route and when the user arrives at “the destination.” Ohnishi, [0117], [0119], [0128], [0144].

D. Geelen (U.S. Patent Application Publication No. 2009/0125234)

78. Geelen published May 14, 2009, as U.S. Patent Application Publication No. 2009/0125234. I understand and have been asked to assume that Geelen is prior art to the '215 patent.

79. Geelen discloses providing navigation directions “for walkers” using a “real time” video feed on a portable electronic device by superimposing “the navigation directions over the camera image.” Geelen, [0002], [0017], [0061], [0071]. Geelen’s superimposed navigation directions include direction indicators (pink), e.g., “an arrow indicating a right turn,” and an indicator of the “distance to the destination 26” (green). Geelen, [0017], [0064], FIGS. 10, 12.

Fig 10



Geelen, FIG. 10 (annotated).

E. Waldman, Kankainen, Ohnishi, and Geelen Are Analogous Art to the '215 Patent

80. Taking into consideration the test for “analogous art” discussed above (*supra* ¶ 55), it is my opinion that Waldman, Kankainen, Ohnishi, and Geelen are analogous art to the '215 patent because each reference, like the '215 patent, is directed to the same field of endeavor: methods for using a portable electronic device to direct a user to a destination by detecting movement of the portable electronic device. *Compare* Ex. 1001, 2:20-26, *with* Waldman, [0005], [0010], [0039], [0052]; Kankainen, [0034], [0039], [0073], [0075]; Ohnishi, [0117], [0119], [0128], [0144]; Geelen, [0002], [0017], [0061], [0071]. Like the '215 patent, the prior art methods also include directing the user to their destination using visual and/or tactile output, including augmented user interfaces. *Compare* Ex. 1001, Abstract, 2:20-26, *with* Waldman, [0010], [0031], FIG. 3; Kankainen, [0039], [0065], [0073], [0075], FIGS. 6C, 6D, 6H; Ohnishi, [0010], [0016], [0061]; Geelen, [0017], [0061], [0064], FIGS. 10, 12. Furthermore, each of these references attempts to solve at least one of the same problems as the '215 patent, for example, directing a user to an object or destination. *Compare* Ex. 1001, Abstract, 2:20-26, *with* Waldman, [0010], [0031], FIG. 3; Kankainen, [0039], [0065], [0073], [0075], FIGS. 6C, 6D, 6H; Ohnishi, [0010], [0016], [0061]; Geelen, [0017], [0061], [0064], FIGS. 10, 12.

IX. GROUNDS OF UNPATENTABILITY

81. Based on my review of the materials set forth above, including my application of the knowledge of a person of ordinary skill in the art, it is my opinion that claims 1-22 of the '215 patent would have been obvious to one of ordinary skill in the art.

82. In particular, it is my opinion that claims 1-22 of the '215 patent would have been obvious to a person of ordinary skill in the art based on the combinations shown below:

Ground	Claim(s) Challenged	35 U.S.C. §	Obviousness Basis
1	1-11 and 14-22	103	Waldman and Kankainen
2	12 and 13	103	Waldman, Kankainen, and Ohnishi
3	1-7 and 14-22	103	Kankainen
4	8-11	103	Kankainen and Geelen
5	12 and 13	103	Kankainen and Ohnishi

X. THE CHALLENGED CLAIMS ARE UNPATENTABLE BASED ON THE PRIOR ART

83. In my opinion, claims 1-22 would have been obvious to one skilled in the art at the earliest priority date of the '215 patent.

A. Ground 1: Waldman and Kankainen Render Obvious Claims 1-11 and 14-22

1. Independent Claim 1

84. Waldman discloses or suggests each element of claim 1. It is also my opinion that Kankainen discloses and renders obvious detecting movement “that results from ... walking” in [1a] if the Patent Owner or Patent Office finds that Waldman does not disclose or render it obvious.

a. [1Preamble] “A method, comprising:”

85. To the extent the preamble is limiting, Waldman discloses [1Preamble] because Waldman discloses methods for “displaying augmented reality maps” and “augmenting a video stream of a device’s present surrounding with navigational information.” Waldman, [0005], [0011].

b. [1a] “detecting a movement of a portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”

86. Waldman, or Waldman in combination with Kankainen, renders obvious element [1a].

87. Waldman discloses a “portable electronic device[,]” “handheld electronic device,” or “handheld communication device,” such as a smartphone, for navigating from a current location to a POI along a prescribed route. Waldman, Abstract, [0002], [0031], [0045], [0047], FIGS. 3-4. The device’s location and movement may be detected using “GPS coordinates” or “triangulation methods” so

that the device continuously receives “updated location and directional information” as the “user and associated device progress [move] along a route.”

Waldman, [0007], [0024], [0052].

88. In one example in Waldman, when the POI is Buena Vista Park (green), for example, the device shows a prescribed route in a first direction (red) along Dolores St. Waldman, [0031]-[0032]. “As the user follows the specified direction to the selected [POIs],” the device’s movement along the path is detected, and the device receives updated location and directional information resulting from the movement in the first direction. Waldman, [0031]-[0032], [0052], claim 7 (“update the illustrated portion of the route as the GPS location of the video capture device changes with movement along the route”).

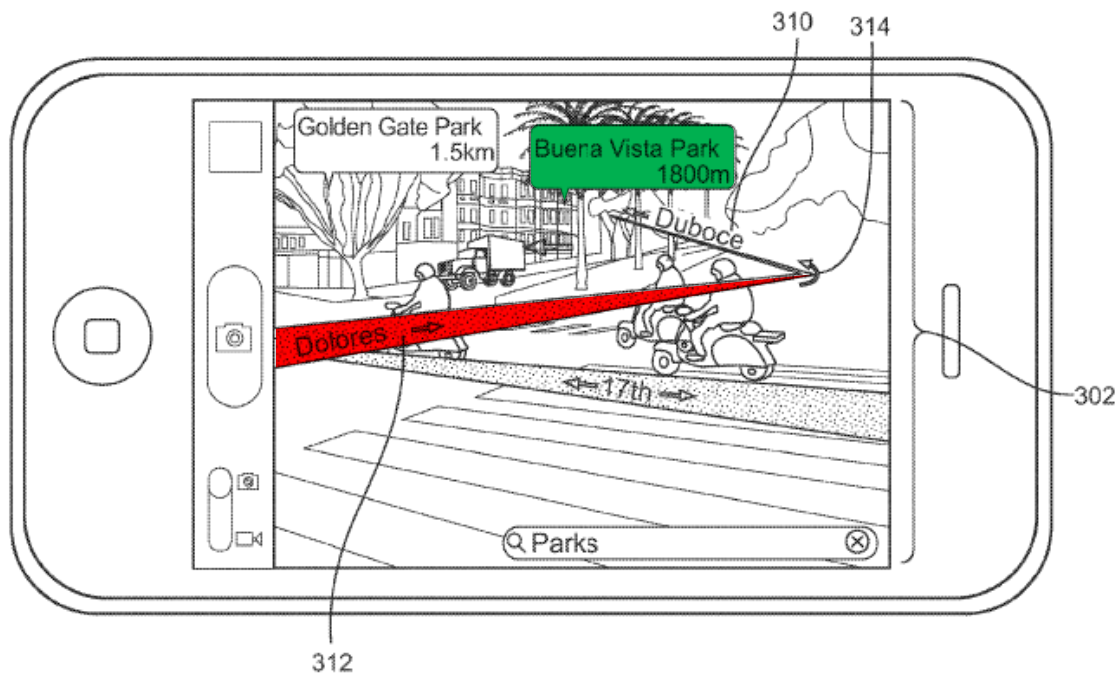


FIG. 3

Waldman, FIG. 3 (annotated).

i. Obviousness over Waldman

89. To the extent that Waldman does not expressly disclose or teach detecting a movement of the device in a first direction that results from a user walking with the device in the first direction, a POSITA would have understood that Waldman's disclosure of detecting a handheld device's "movement along the route" and automatically updating the route/directions "[a]s the user and associated device progress along a route," suggests or renders obvious detecting movement resulting from the user "walking" because users routinely walk to destinations, like parks and other nearby locations, while holding such portable electronic devices. Further, even when other modes of transportation (e.g., cars or bikes) are used to

cause “movement” along a route, walking frequently forms a key part of the overall transportation picture, e.g., when the user parks their car or completes public transit, and needs to find their way from the parking or drop-off location to their destination via sidewalks, alleys, or other pedestrian pathways inaccessible by car or transit. This would have been particularly useful in cities with limited parking, such as San Francisco where Waldman’s example takes place, and a POSITA would have been motivated to detect movement based on walking to guide the user to their destination when they may not be close to the destination after parking or exiting public transit.

(a) Motivation to Combine

90. A POSITA would have been motivated to use Waldman’s handheld electronic device to detect movement that results from a user walking in the first direction to provide useful navigation guidance to the user while on foot. A POSITA would have been particularly motivated to detect movement caused by walking to provide navigation in walkable cities, such as San Francisco, and to walkable destinations, such as parks (e.g., Buena Vista Park). Waldman, FIGS. 2-3 (showing proximity of POIs in San Francisco, including Buena Vista Park, only 1800m from the user); Kankainen, [0023]. A POSITA would have been motivated to include this detection to provide real-time, continuous navigation so that the user can track their progress and have access to “automatically update[d]” navigation

directions “[a]s the user and associated device progress,” e.g., walk, “along the route,” which improves the user experience of following the directions. Waldman, [0007]. Furthermore, a POSITA would have understood that navigation routes often include a walking component, e.g., from a parking location to a final destination (and vice versa) and recognized the need to adapt navigation directions based on the mode of transportation (e.g., foot, bike, car, and combinations). A POSITA would be motivated to detect movement based on walking to account for mixed transportation and ensure that the user is able to locate their destination on foot, even when driving or using public transit, before walking to the destination. This would have been particularly useful in cities with limited parking, such as San Francisco where Waldman’s example takes place. For example, a POSITA would have been motivated to detect movement based on walking to guide the user to their destination from a public transit drop-off location, such as a bus stop, subway or light-rail station, or car parking lot, to the destination because in many cities, like San Francisco, New York, and Washington, D.C., there is limited parking and a POSITA would have been motivated to provide directions to a user for the entire navigational period, including any walking portions.

(b) Expectation of Success

91. A POSITA would have had a reasonable expectation of success in detecting movement of the electronic device in Waldman that results from the user

walking with the device because it was conventional in the art at the time of the invention to use GPS, “triangulation,” or various terrestrial-based location determination technologies/techniques (techniques expressly contemplated by Waldman) to detect movement caused by walking. Waldman, [0007], [0024], [0031], [0032], claim 7. Indeed, a POSITA would have understood that, given GPS’s generally high accuracy and frequency of updates, there are few practical limitations or restrictions that would prevent using GPS to detect motion caused by different modes of transportation, including walking. Thus, a POSITA would have recognized that GPS or any other location determination method would detect movement caused by walking just as well as it would for any other movement, such as by vehicle travel or biking. This is also evident from other prior art teachings that expressly disclose using handheld or portable devices to assist users with walking navigation. Kankainen, [0042], [0075] (using GPS to detect device movement “[w]hen the user starts walking” in a direction towards a POI); Ex. 1008 (Williamson), [0014], [0050], [0123], [0125], [0159], FIG. 7 (using GPS to detect mobile phone movement resulting from a user “walking,” “biking,” or driving); Ex. 1009 (Geelen), [0058], [0061] (using GPS to detect a handheld device’s movement when “a walker[]” follows navigation directions to a POI); Ex. 1013 (Ma), [0093] (also describing methods for directing a user to a POI using overlaid video navigation, and wherein the prescribed route is restricted to “pedestrian

walkways, sidewalks, [and] paved paths”), FIGS. 2-3. Thus, using Waldman’s locating techniques to detect device movement that results from the user walking in a first direction would have only required the application of known, conventional techniques (GPS or various terrestrial-based location determination technologies/techniques) to yield predictable results (detecting device movement—when the user walks in a direction), as evidenced by Kankainen, Williamson, Geelen, and Ma.

ii. Obviousness over Waldman in combination with Kankainen

92. To the extent Waldman alone does not render obvious detecting movement of the device “that results from a user walking,” it is my opinion that Kankainen does.

93. Kankainen discloses a method for directing a user “walking along [a] route” from a “current location,” such as Farragut West Metro Station “located at 900 18th St. NW” in Washington, D.C., to a POI, such as the International Monetary Fund (“IMF”) “located at 700 19th St. NW[,] Washington D.C.,” using an augmented mapping and navigation application on a “mobile terminal,” “portable terminal,” or “user equipment (UE),” which is a portable electronic device. Kankainen, [0034], [0042], [0047], [0073], [0075]. Kankainen teaches that “an inherent property of an augmented reality user interface is that the display follows the movement and pointing of the UE 101” so that “[w]hen the user starts

walking on the route,” the UE’s movement is detected by the UE’s GPS and “a live image view of the surrounding location” is presented on the UE’s screen.

Kankainen, [0034], [0071], [0075]. “As the user continues walking along the route” in a first direction, such as along H St., the walking movement is detected and the “application displays the live image” of the route, including the cross section at 19th St. and H St. Kankainen, [0034], [0075]. The application continues to update the live image and route as the user walks in a second direction, left onto 19th St. Kankainen, [0034], [0075].

(a) Motivation to Combine

94. Kankainen further teaches that “walking directions” are desirable “if a user wants to find out how to walk” from one point to another. Kankainen, [0023]. This is consistent with the state of the art at the time of the invention (*see* Williamson, Geelen, and Ma, *supra* § X.A.1.b.i(a) ([1a] Motivation to Combine)) and Kankainen’s exemplary application, which like Waldman, is particularly directed to navigating in walkable cities to walkable destinations. Kankainen, [0034], [0075] (describing a walking route in Washington, D.C., and extending a few blocks). Thus, a POSITA would have been motivated to detect motion “that results from a user walking” to enable the user to find out how to walk to their desired destination and ultimately navigate to the desired POI on foot. *See also supra* § X.A.1.b.i(a) ([1a] Motivation to Combine).

(b) Expectation of Success

95. Kankainen and Waldman are in the same technical field and address similar problems (user navigation on a handheld device) with similar solutions (using an augmented reality application to provide navigation and a GPS to detect the device's progress along the route). A POSITA would have understood, based on their commonality, that the teachings in Kankainen are readily applicable to those in Waldman and vice versa. Kankainen, [0034], [0039], [0075]; Waldman, [0005], [0010], [0031]. Thus, a POSITA would have had a reasonable expectation of success in using Waldman's GPS to detect device movement resulting from the user's walking, as taught by Kankainen, for the reasons discussed above. *Supra* § X.A.1.b.i(b) ([1a] Expectation of Success). Such an implementation would have merely required the use of existing components (a GPS receiver) to perform routine functions (assessing device location over time, which corresponds to movement).

c. [1b] "receiving video data captured in a first direction by a video capture device during the movement,"

96. Waldman discloses element [1b].

97. While en route in the first direction on Dolores St., the user "points" the smartphone "to capture [receive] and display a real-time video stream of [the device's] view" using the device's "onboard camera" or "video capture device." Waldman, [0010], [0011] ("The user can instruct the device to initiate a live video

feed using an onboard camera and display the captured video images on a display.”), [0018], [0031], [0034] (describing “capturing and displaying a video stream on a handheld communication device”), claim 7. Thus, when the user “points” the device’s camera in the first direction (red) down Dolores St. “to begin travelling” to Buena Vista Park and “follows the specified direction” along Dolores St., the video is captured in the first direction along Dolores St. and during the movement. Waldman, [0010], [0011], [0018], [0025], [0031], [0034], [0052].

98. I have also been asked to consider interpretations of “a first direction” in element [1b] where it includes either (1) the direction the user is walking in [1a] or (2) the direction the video capture device is pointing, which may be different “first direction[s].” In my opinion, Waldman teaches both meanings. For example, while the user is en route in the first direction on Dolores St., the user “points” the smartphone in that direction “to capture [receive] and display a real-time video stream of [the device’s] view” using the device’s “onboard camera” or “video capture device.” Waldman, [0010], [0011] (“The user can instruct the device to initiate a live video feed using an onboard camera and display the captured video images on a display.”), [0018], [0031], [0034] (“capturing and displaying a video stream on a handheld communication device”), claim 7. As such, the video camera captures and the display screen displays video data of the direction the user is walking along the route and the direction the video camera is pointing while the

user walks along the route (either when the user points the camera down the navigation route or adjusts the angle of the camera to be off from the navigational route). Thus, when the user “points” the device’s camera in the same direction as they are walking (as in the first potential interpretation) or a different direction (as in the second potential interpretation) while the user “begin[s] travelling” to Buena Vista Park, video is captured during the movement in each respective direction (satisfying either interpretation). Waldman, [0010], [0011], [0018], [0025], [0031], [0034], [0052].

99. The ’215 patent does not propose a particular definition for the term “video data” but does explain that certain input or image capture devices, namely, a “video camera” and “video capture devices,” are used to acquire such data. Ex. 1001, 5:5-10, 24:44-53, 24:66-25:3. A POSITA would have understood that Waldman’s captured “real-time video stream” includes video data because it includes real-time images and information captured using the device’s “onboard camera,” a video capture device. Waldman, [0010], [0011], claim 7. A POSITA also would have recognized that the video feed needs to include video data for Waldman’s video capture device/camera to capture, process, display, or (if recording) store the video. Thus, when the user “points” the device’s camera in the first direction (red) down Dolores St. and “follows the specified direction” along Dolores St., the device receives video data captured in the first direction along

Dolores St. by the camera during the movement. Waldman, [0010], [0018], [0025], [0031], [0034], [0052]. This is also consistent with the data acquisition techniques discussed in the '215 patent. Ex. 1001, 26:57-64 (discussing “pointing the image capture device to the right of the PED 502 from the PED user’s perspective to receive image data captured of the object”).

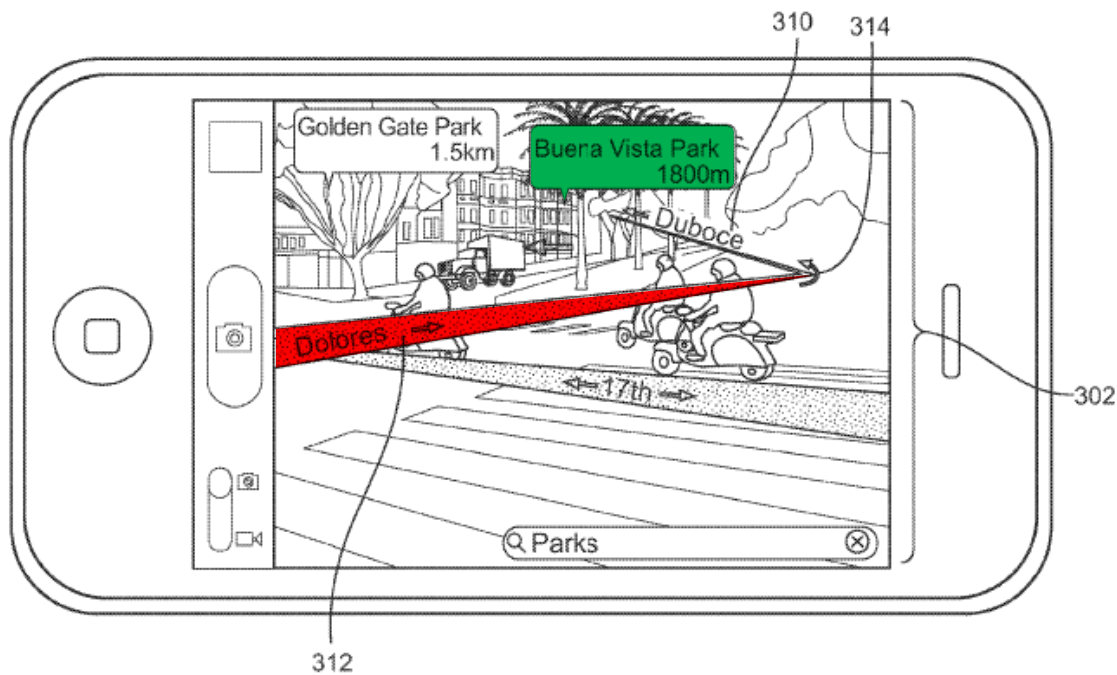


FIG. 3

Waldman, FIG. 3 (annotated).

d. [1c] “where a first object is in a second direction;”

100. Waldman discloses element [1c].

101. Waldman discloses that the user’s POI/destination, “Buena Vista Park” (green)—a first object—is located in a second direction (blue) away from Dolores Street, shown in annotated FIG. 3 below. Waldman, [0031], FIG. 3. As

shown in annotated FIG. 3, the second direction is indicated by “a left turn onto Duboce Ave. [(blue)] from Dolores St. [(red)]” as shown by a turning point 314 and direction line, which indicates a different direction, to arrive at Buena Vista Park (green). Waldman, [0031], FIG. 3.

102. A POSITA would have understood that Buena Vista Park is a “first object” within the meaning of the '215 patent because it is an object with a fixed, stationary, or otherwise known location. Ex. 1001,16:39-65 (describing “various objects with fixed locations and/or otherwise known locations”); Ex. 1002, 442 (arguing that the claims “cover ... situations where the object is stationary (e.g., [has a fixed location]) and the portable electronic device is the only entity that moves”).

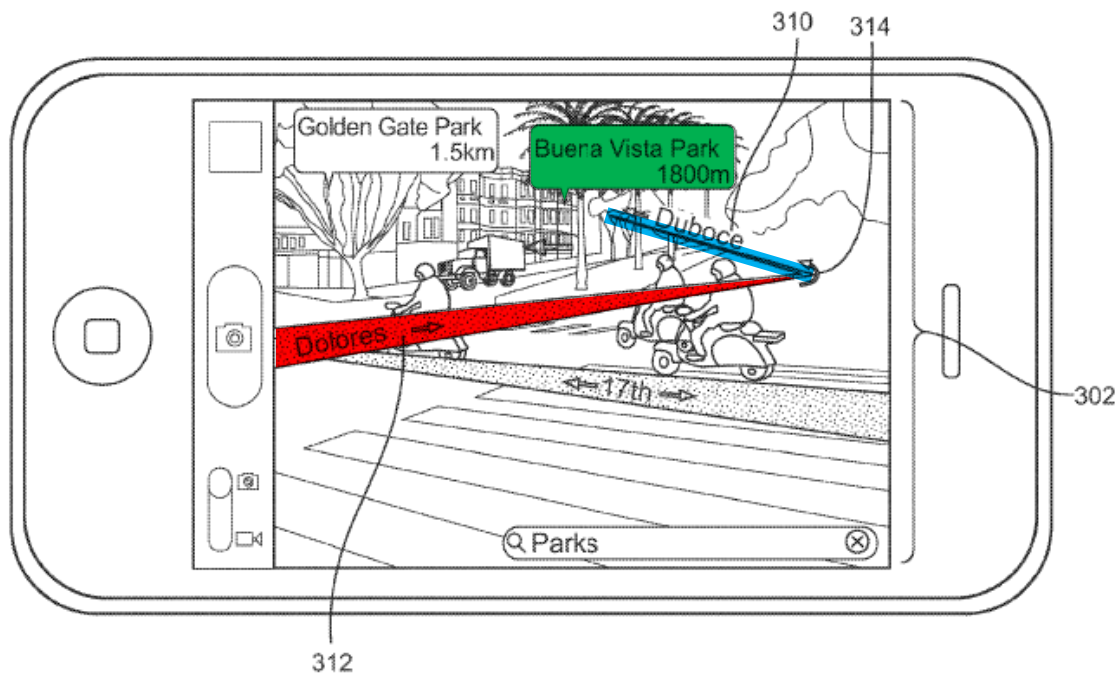


FIG. 3

Waldman, FIG. 3 (annotated).

- e. [1d] “and presenting a video by a display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”

103. Waldman discloses element [1d].

104. As discussed in [1b], Waldman captures video using an “onboard camera.” Waldman, [0010], [0011]. Waldman uses the handheld device’s “screen” (e.g., display 634), a display device, to “display a real-time video stream of a view” that is viewable to the user. Waldman, [0006], [0010], [0025], [0031], [0050], [0051], claims 8, 17, FIGS. 3, 6; *supra* § X.A.1.c ([1b]). The “real-time video stream” is viewable to the user because it is presented on the smartphone’s screen,

a display device. Waldman, FIG. 3. Waldman explains that video images are “displayed on the display 634” of the electronic device, and similarly that “the processor 620 instructs the camera 638 to begin feeding video images to the display 634.” Waldman, [0047], [0050]. This is confirmed because Waldman discloses that the user selects a POI using the device’s “touch screen,” which a POSITA would have understood describes FIGS. 1 and 3, in which the device displays the video on the touch screen display of the device being viewable to the user. Waldman, [0006], [0021], FIGS. 1, 3.

105. Waldman further discloses using the presented, viewable video to direct the user in a second direction ([blue](#)) away from Dolores St. onto Duboce Ave. towards the first object, Buena Vista Park ([green](#)), by “visually augment[ing] the captured video stream with a directional map to [the] selected [POI].” Waldman, [0010], [0018], [0031]. For example, Waldman’s FIG. 3 shows “visually augment[ing]” the displayed video “with a directional map 310 to the selected POI, i.e., ‘Buena Vista Park,’” which “indicates a turn 314 that the user must take, i.e., a turn left onto Duboce Ave. [second direction, ([blue](#))] from Dolores St.,” thus directing the user down Duboce Ave. towards Buena Vista Park. Waldman, [0031].

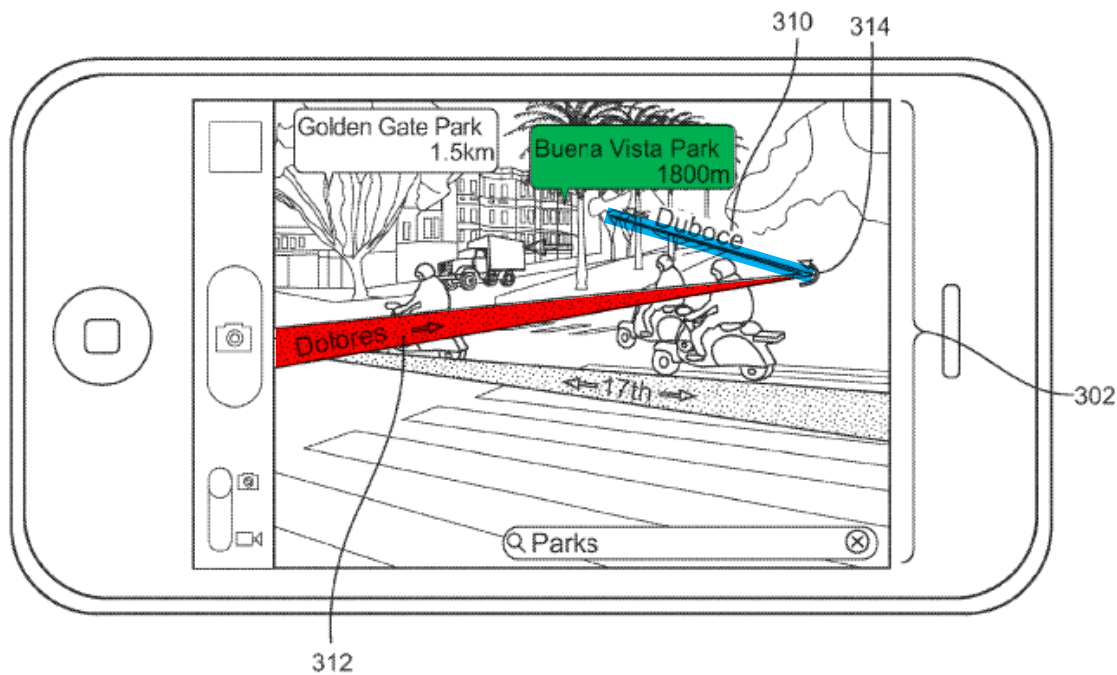


FIG. 3

Waldman, FIG. 3 (annotated).

106. I have also been asked to consider element [1d]’s recitation of directing the user in “a second direction” if it is interpreted to mean (1) a second direction that the user is walking in, (2) a second direction that the camera is pointing, or (3) a second direction for navigating the user towards the first object (e.g., turn left). In my opinion, Waldman teaches each interpretation. Waldman discloses that while walking en route in the first direction down Dolores St., the user “points” the smartphone in the direction he or she is walking, or to one side, and “follows [walks in] the specified direction” as the user navigates to Buena Vista Park. Waldman, [0010], [0011], [0018], [0025], [0031], [0034], [0052],

claim 7. Because Waldman's device displays the augmented video showing the navigation directions when the user points the device along Dolores St. in the direction he or she is walking and as the angle of the device changes away from the direction he or she is walking, but the navigation line is still in view, Waldman discloses interpretations (1) and (2). Waldman also discloses using the presented, viewable video to direct the user in a second direction (blue) away from Dolores St. onto Duboce Ave. towards the first object, Buena Vista Park (green), using visual augmentations, which, in my opinion, satisfies interpretation (3). Waldman, [0010], [0018], [0031]. In FIG. 3, for example, the displayed video is augmented "with a directional map 310 to the selected [POI], i.e., 'Buena Vista Park,'" including "a turn 314 that the user must take, i.e., a turn left onto Duboce Ave. [second direction (blue)] from Dolores St." Waldman, [0031].

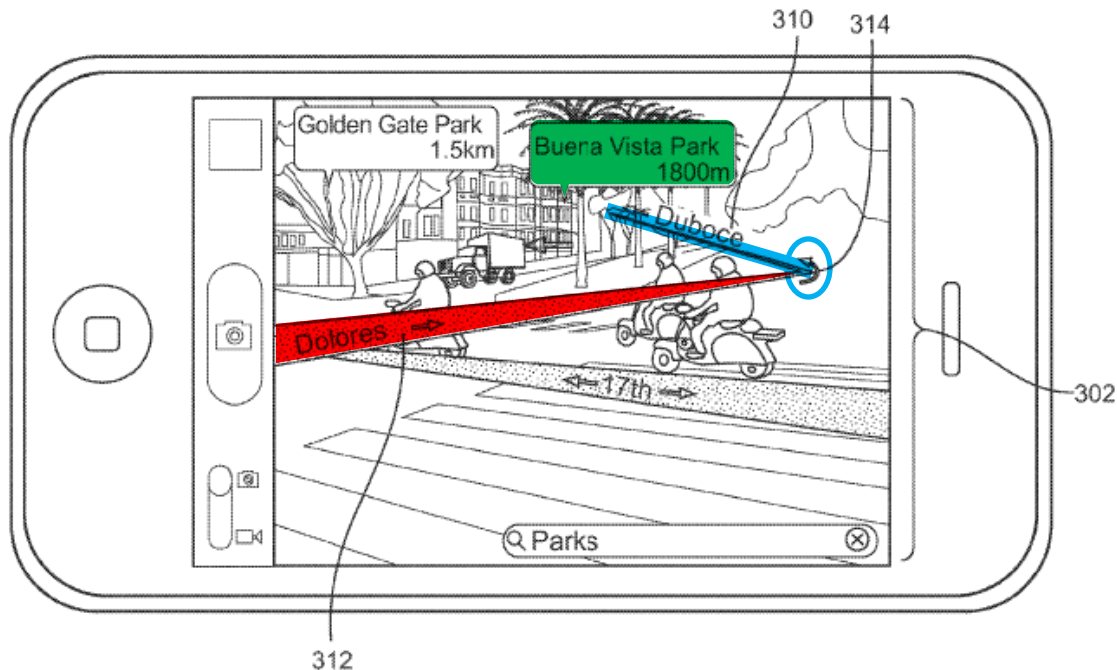


FIG. 3

Waldman, FIG. 3.

2. [Claim 2] “The method of claim 1 wherein information is integrated with the video, the information for directing an attention of the user to the first object.”

107. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

108. Waldman discloses the additional limitations of claim 2.

109. As discussed for [1d], Waldman discloses presenting a video directing the user towards Buena Vista Park (first object). *Supra* § X.A.1.e ([1d]); Waldman, [0010], [0031].

110. Waldman further discloses integrating information, such as indicator graphics, with the video for directing the user’s attention to Buena Vista Park by

“visually augment[ing] the captured video stream.” Waldman, [0010], [0018], [0031], [0040]. FIG. 3 shows, for example, “a direction 312 [(pink)] that the user must travel on Dolores St. to begin travelling to reach ‘Buena Vista Park’” and “a turn 314 [(pink)] that the user must take, i.e., a turn left onto Duboce Ave. from Dolores St.” Waldman, [0031], FIG. 3. The indicator “Duboce” is also overlaid onto Duboce Ave. in Waldman’s FIG. 3. Waldman, FIG. 3.

111. A POSITA would have understood that this information directs the user’s attention to Buena Vista Park by providing a visual representation that directs the user to change their location (for example, with arrow 312) or a visual representation that directs the user to change their direction (as with turn 314). Waldman, [0031], FIG. 3. This is consistent with the ’215 patent, which does not define integrated information, but does explain that “attention output,” such as “[a] visual pattern[,] may be integrated into an image presented based on captured image data,” and that “the pattern may direct [the] attention and/or otherwise alter an attribution of attention of a user,” including by “direct[ing] a user to *change direction*” or *location*. Ex. 1001, 29:31-39 (emphasis added).

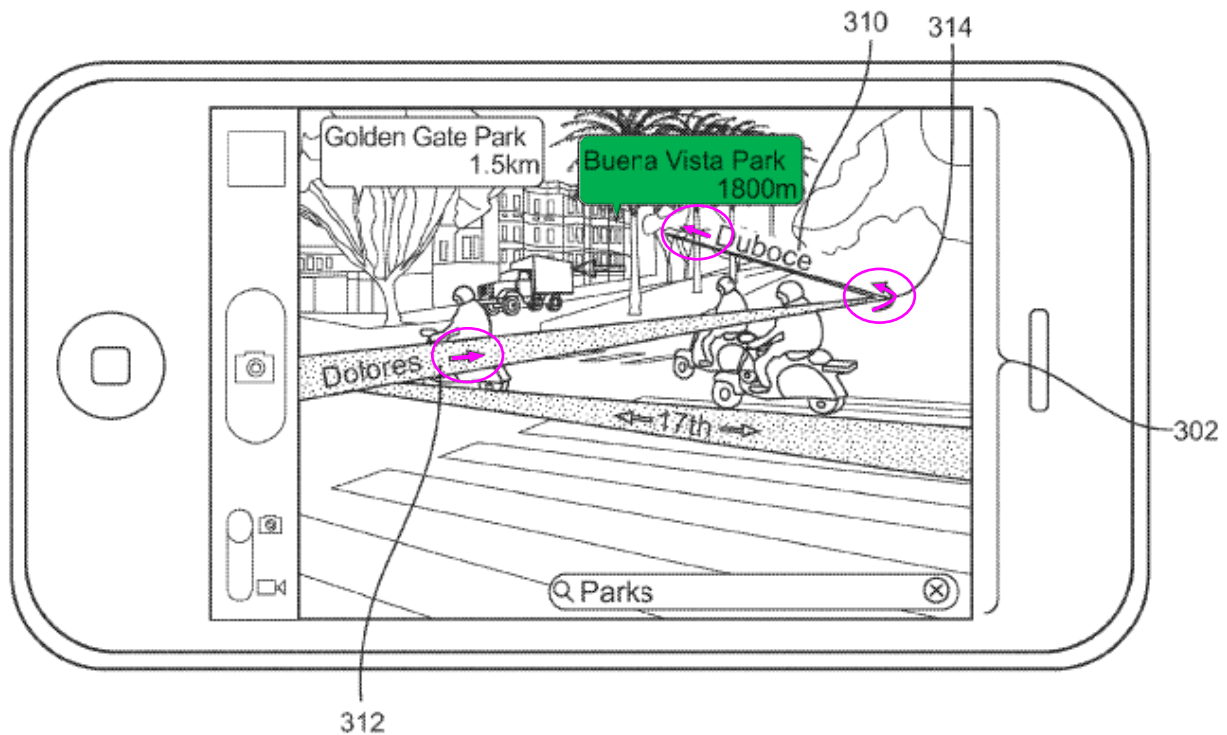
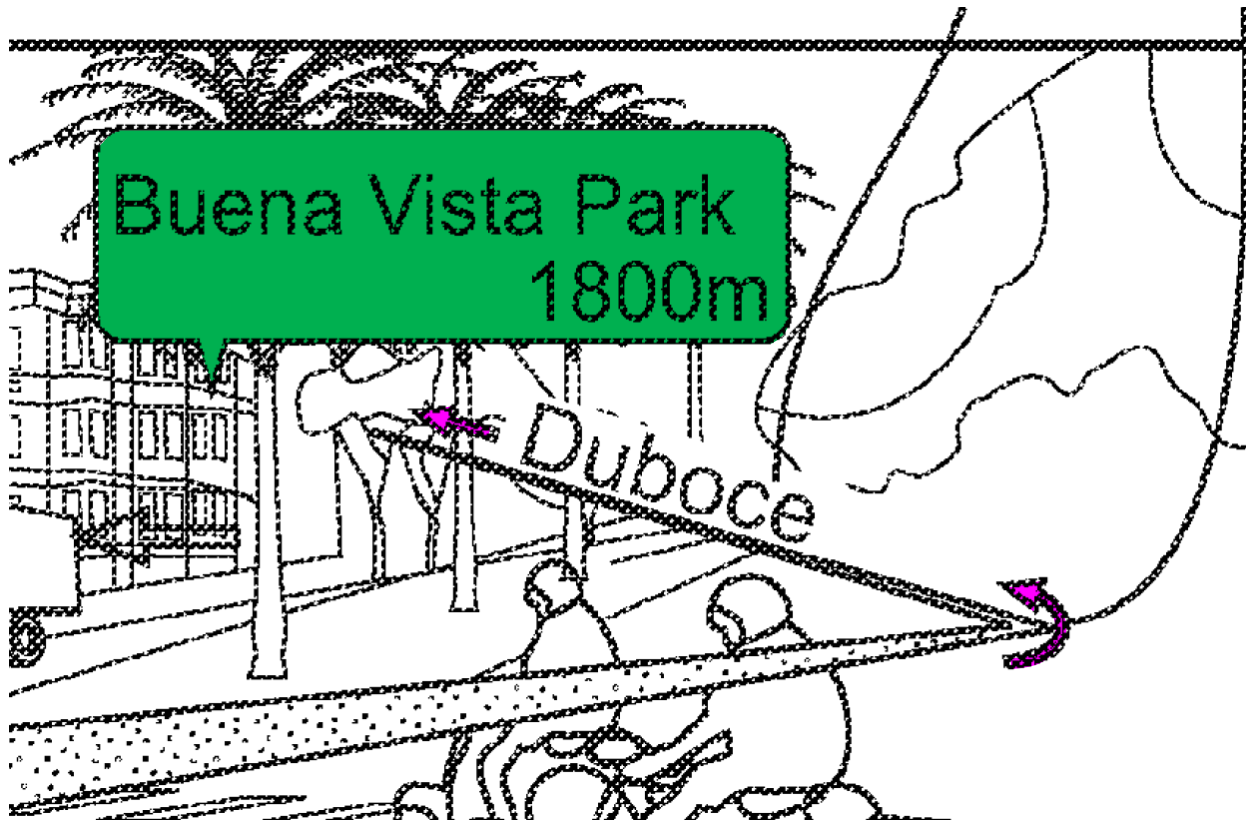


FIG. 3

Waldman, FIG. 3 (annotated).

112. Waldman's augmented video stream also includes "bubbles" (green) integrated with the video and for identifying the POI's "relative geographic position" (e.g., by the indicator point) and proximity (e.g., 1800m) from the user/device. Waldman, [0021], [0031], FIG. 3. Like the indicators (e.g., street name "Duboce" and arrows 312, 314), Waldman's bubble provides a visual means for directing the user's attention to Buena Vista Park. Waldman, [0021], [0031], FIG. 3.



Waldman, FIG. 3 (excerpted, annotated).

3. [Claim 3] “The method of claim 1 wherein information is integrated with the video, the information for instructing the user to direct an attention to the first object.”

113. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

114. Waldman discloses the additional limitations of claim 3.

115. As discussed for claim 2, Waldman discloses integrating information, such as arrows and bubbles, with the video for directing the user’s attention to Buena Vista Park by “visually augment[ing] the captured video stream.” Waldman, [0010], [0018], [0021], [0031], [0040].

116. The integrated information also instructs the user to direct their attention to Buena Vista Park, like the “attention output” described in the ’215 patent and as discussed in claim 2. *Supra* § X.A.2 (claim 2). For example, the arrows corresponding to direction 312 (pink) and turn 314 (pink) instruct the user to direct their attention to Buena Vista Park because they provide visual means for instructing the user how to get there. Waldman, [0021], [0031], FIG. 3. That is, the straight arrow extending along Dolores St. tells (instructs) the user to go straight, while curved arrow 314 instructs the user to turn left onto Duboce Ave. Waldman, [0021], [0031], FIG. 3.

117. The bubble (green) integrated with the video, including the small point of the bubble pointing downward to the location of Buena Vista Park, also instructs the user to direct their attention to Buena Vista Park because it identifies the POI, its “relative geographic position,” and its proximity (1800m) to the user/smartphone, thereby “allow[ing] the user to determine a general direction” to the point of interest. Waldman, [0021]. That is, the bubble provides visual means for telling (instructing) the user about Buena Vista Park’s relative location and the user’s proximity to it.

118. These interpretations are also consistent with the ’215 patent, which does not define “information for instructing,” but does explain that the “attention output” (as discussed for claim 2) “refers to a user-detectable output to attract,

instruct, and/or otherwise direct the attention of a user of a portable electronic device,” and includes visual patterns, images, and alterations to the image’s “presentation.” Ex. 1001, 27:57-59, 28:1-9, 29:1-39.

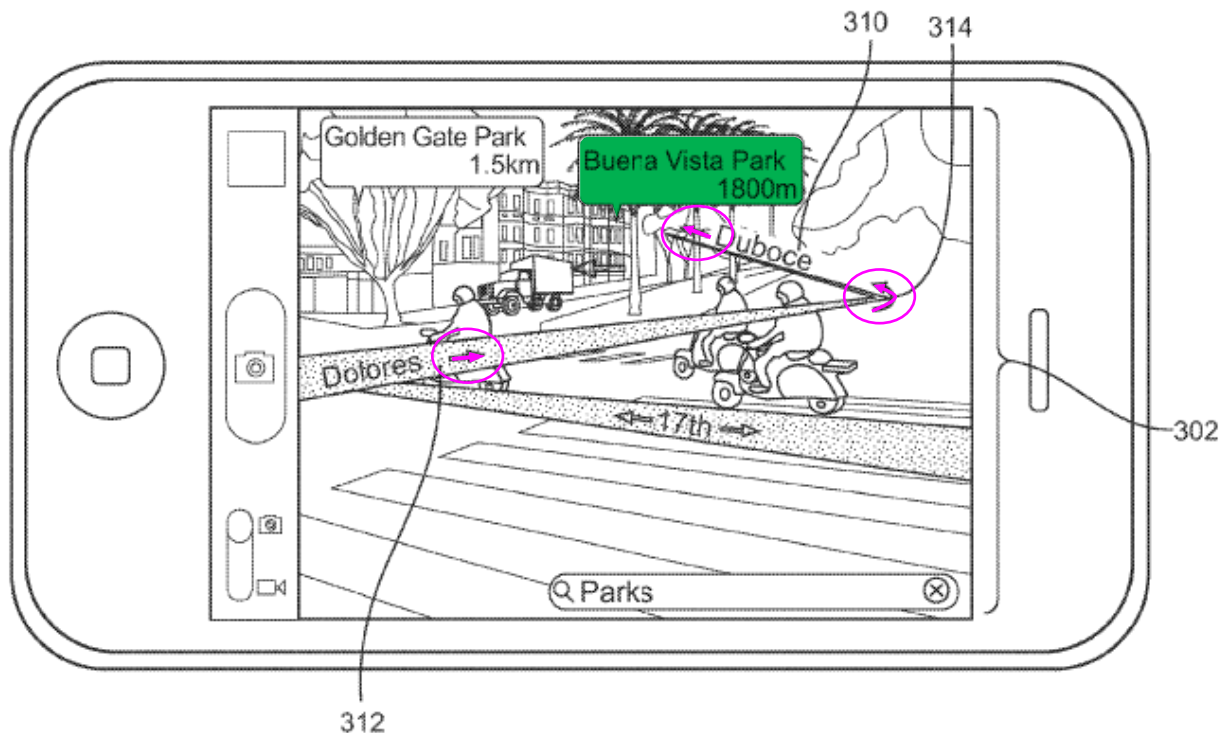


FIG. 3

Waldman, FIG. 3 (annotated).

4. [Claim 4] “The method of claim 1 wherein information is integrated with the video, the information indicating a location of the first object.”

119. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

120. Waldman discloses the additional limitations of claim 4.

121. As discussed for claims 2-3, Waldman discloses integrating information, such as bubbles, with the video for directing the user's attention to Buena Vista Park by "visually augment[ing] the captured video stream." Waldman, [0010], [0018], [0021], [0031], [0040].

122. The '215 patent does not define "location" or require that "location" information be provided with any degree of particularity, but does explain that the disclosed objects have "fixed locations and/or otherwise known locations."

Ex. 1001, 16:39-65. Thus, a POSITA would have understood that "information indicating a location" (fixed or otherwise known) includes data that informs the user of the first object's general or particular location. Such information would have included general descriptors indicating the object's position with respect to the user/device (e.g., straight ahead, on the left, at the corner, object proximity), coordinates, addresses, or other identifiers that the user could reasonably use to ascertain the object's position "with respect to the portable electronic device."

Ex. 1001, 16:14-17.

123. Accordingly, Waldman's integrated information also indicates "a location of the first object" because Waldman expressly discloses that the bubble (green) integrated with the video "allows the user to determine a general direction to a [POI]" and "show[s] the relative geographic position" of Buena Vista Park within the live image view. Waldman, [0021], [0031], FIG. 3.



Waldman, FIG. 3 (excerpted, annotated).

5. [Claim 5] “The method of claim 1 wherein information is integrated with the video, the information including directional information indicating directions to the first object.”

124. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

125. Waldman discloses the additional limitations of claim 5.

126. As discussed for claims 2-3, Waldman discloses integrating information, such as arrows, with the video for directing the user’s attention to Buena Vista Park by “visually augment[ing] the captured video stream.” Waldman, [0010], [0018], [0031], [0040].

127. The integrated information indicates directions to Buena Vista Park because the straight arrow overlaying Dolores St. corresponds to “a direction 312 that the user must travel on Dolores St. to begin travelling to reach ‘Buena Vista Park’”; the curved arrow corresponds to “a turn 314 that the user must take, i.e., a turn left onto Duboce Ave. from Dolores St.”; and the straight arrow on Duboce Ave. corresponds to the direction the user must continue walking on Duboce Ave. to reach Buena Vista Park. Waldman, [0031]. That is, the straight arrow 312 extending along Dolores St. *directs* the user to go straight, the curved arrow 314 *directs* the user to turn left onto Duboce Ave., and the second straight arrow *directs* the user to continue on Duboce Ave. Waldman, [0031], FIG. 3.

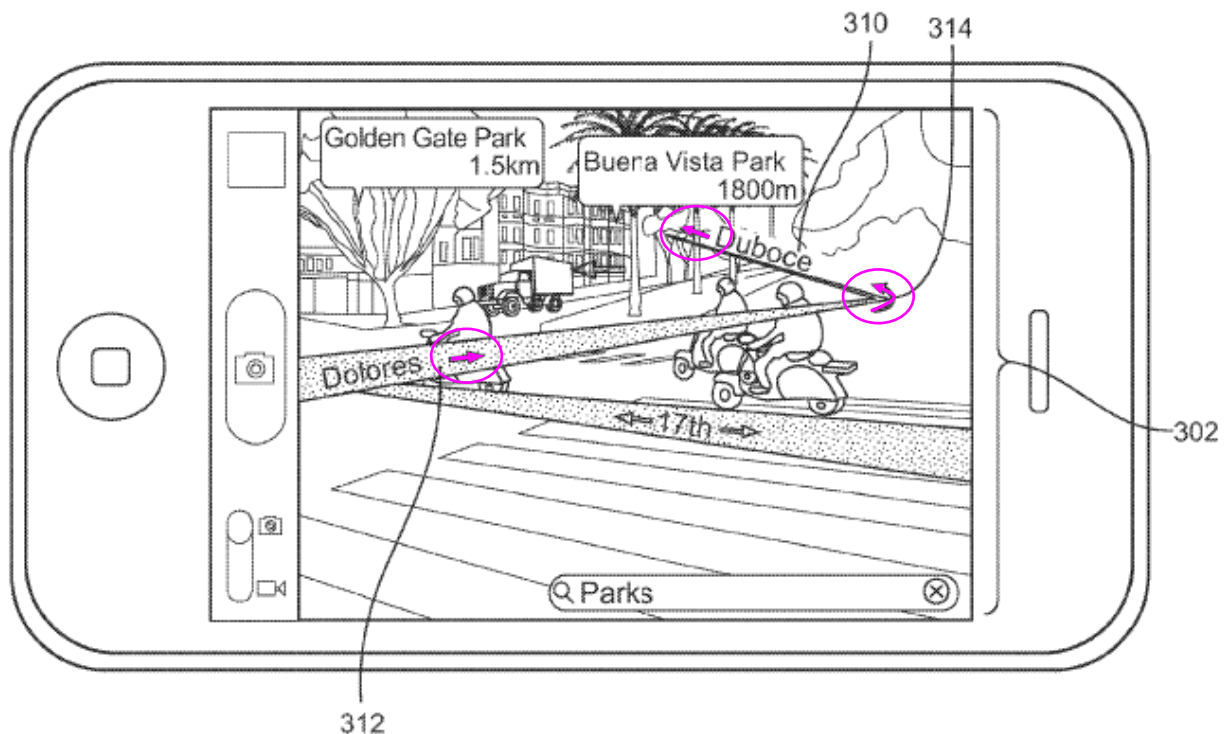


FIG. 3

Waldman, FIG. 3 (annotated).

128. The indicator “Duboce” overlaid onto Duboce Ave. also indicates directions to Buena Vista Park because it directs the user to proceed on Duboce Ave. and only appears when the video “has been visually augmented with route data.” Waldman, [0014], [0031], FIG. 3.

6. [Claim 6] “The method of claim 1 wherein indicia is integrated with the video, the indicia including directional information indicating directions to the first object.”

129. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

130. Waldman discloses the additional limitations of claim 6.

131. As discussed for claims 2-3 and 5, Waldman discloses information “integrated with the video,” including arrows 312 and 314 (pink) and the indicator “Duboce” overlaid onto Duboce Ave., indicating directions to the first object, Buena Vista Park (green). *Supra* §§ X.A.2, X.A.5 (claims 2, 5); Waldman, [0031], FIG. 3.

132. The '215 patent does not define “indicia”; however, a POSITA would have understood that the arrows are indicia because they are “visual augmentation[s]” representing a “directional map” indicating “direction[s]” to reach Buena Vista Park (first object). Waldman, [0010], [0018], [0031], [0039].



7. [Claim 7] “The method of claim 1 wherein indicia is integrated with the video, the indicia indicating directions to the first object, where a location of the indicia on the display device of the portable electronic device is based on a relative position between the first object and the portable electronic device.”

135. As explained for claim 6, Waldman discloses indicia integrated with the video and for indicating directions to Buena Vista Park, such as the straight

arrow corresponding to direction 312 and turn arrow 314. Waldman, [0018], [0031], [0039].

136. The arrow's location on the augmented video, as seen in the screen (display device), is based on a relative position between the first object and the portable electronic device because it indicates and depends on the direction the user "must travel" to reach their destination. Waldman, [0031]. Thus, when the user "points" the smartphone's camera down Dolores St. "to begin travelling" to Buena Vista Park, indicia is overlaid onto, or located on, Dolores St. between the smartphone and Buena Vista Park, and the arrow 314 is overlaid at the location of the turn onto Duboce Ave. Waldman, [0010], [0025], [0031].

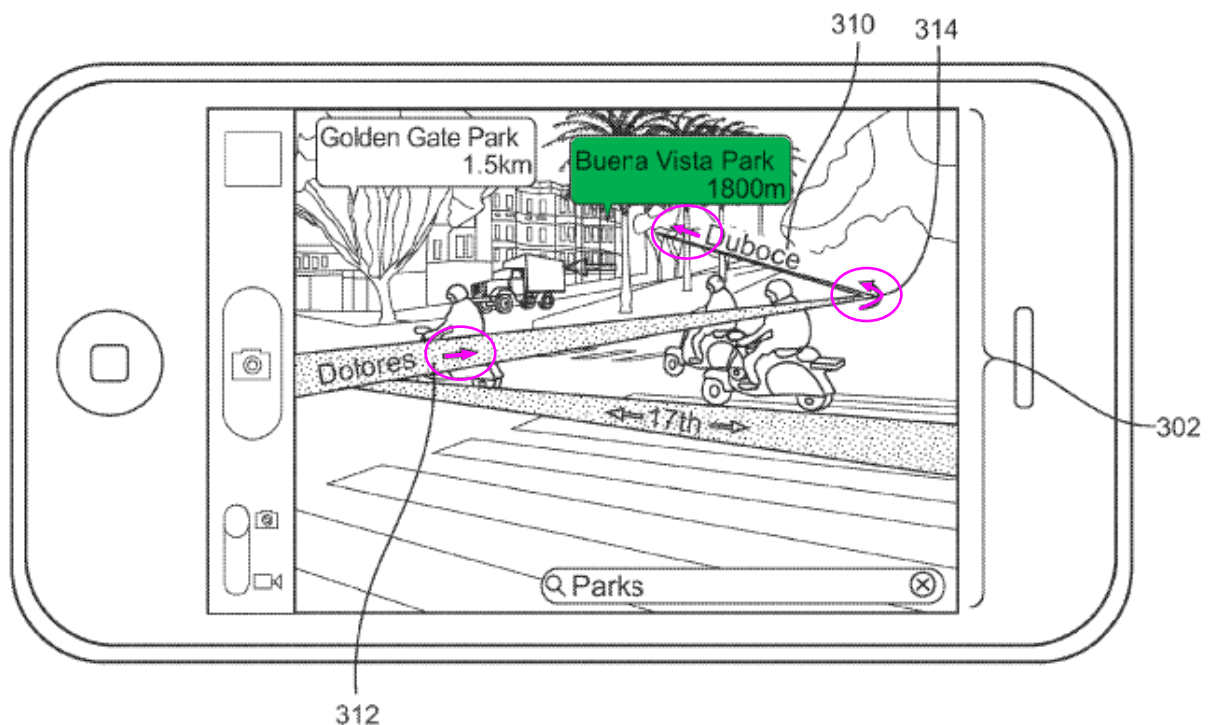


FIG. 3

Waldman, FIG. 3 (annotated).

137. This is consistent with the disclosed embodiments of the '215 patent, which present attention output “in a location that is defined to direct attention of a user of PED 602 based on location” by presenting the output “in the top, right corner” of the display to “direct the user to look up and to the right.” Ex. 1001, 29:1-6, FIG. 6.

8. [Claim 8] “The method of claim 1 wherein first indicia and second indicia are integrated with the video, the first indicia indicating directions to the first object, the second indicia indicating a distance to the first object.”

138. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

139. Waldman discloses the additional limitations of claim 8.

140. As explained for claims 6-7, Waldman discloses indicia integrated with the video and for indicating directions to Buena Vista Park, such as direction and turn arrows 312 and 314 and street name “Duboce.” Waldman, [0018], [0031], [0039], FIG. 3. Arrows 312, 314 (pink) and/or the street name “Duboce” are “first indicia.” Waldman, [0018], [0031], [0037].

141. As discussed for claims 2-3, Waldman’s “bubble” is also integrated with the video stream and shows the “relative geographic position” and the distance (“1800m”) from the user/device to the first object (POI, Buena Vista Park). Waldman, [0021], [0031], [0038], FIG. 3. The “bubble” (green) comprises

second indicia because it indicates the distance (“1800m”) to Buena Vista Park, as shown below. Waldman, [0021], [0031].

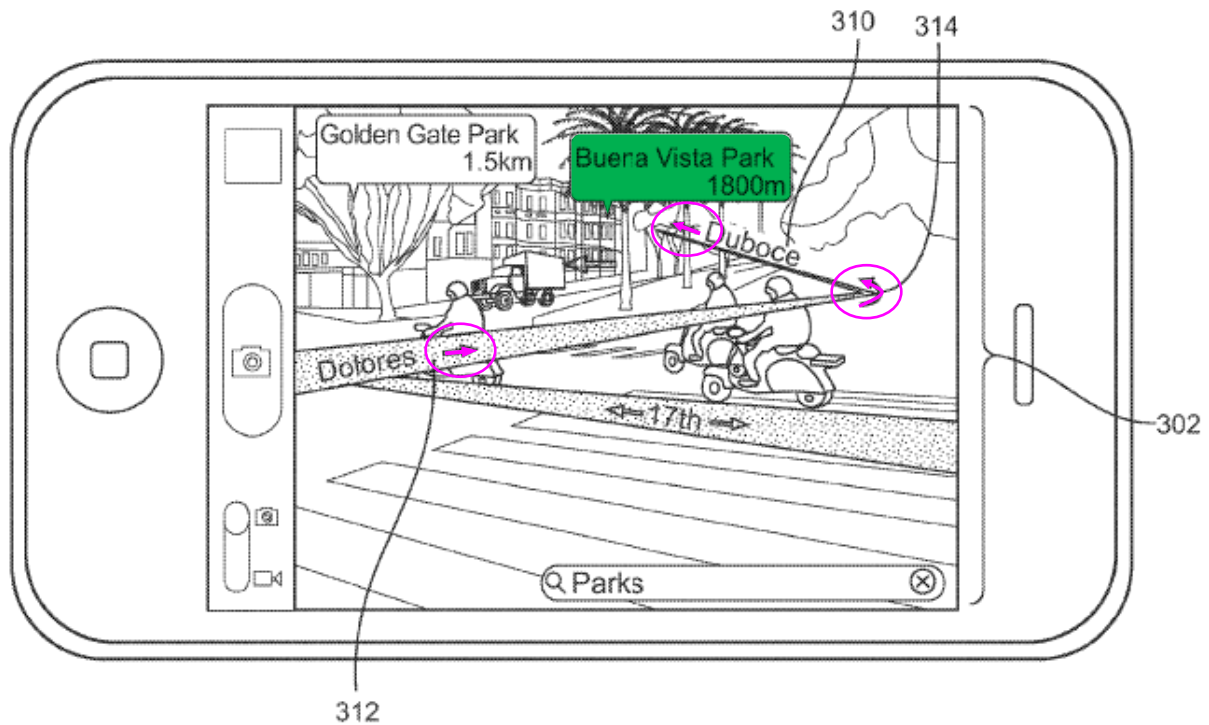
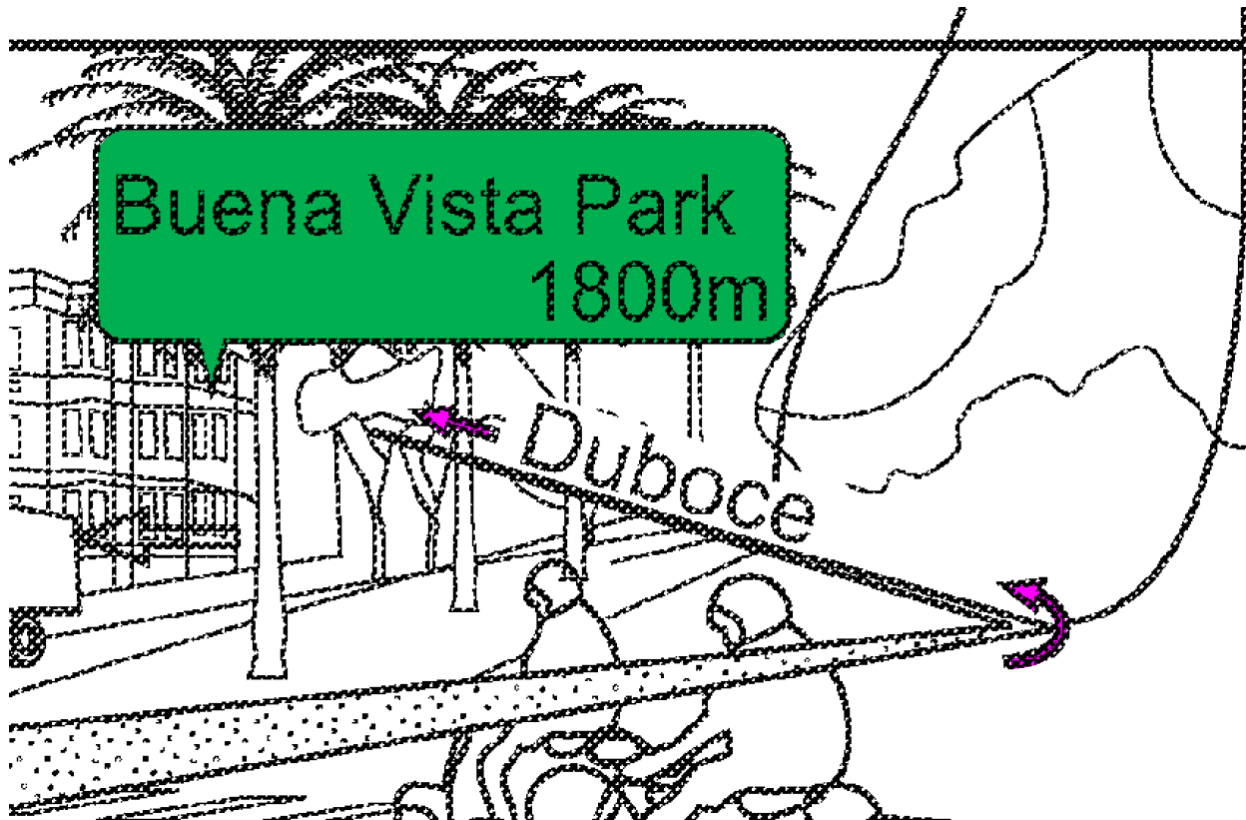


FIG. 3

Waldman, FIG. 3 (annotated).



Waldman, FIG. 3 (excerpted, annotated).

9. [Claim 9] “The method of claim 8 wherein the first indicia and the second indicia are updated based on the movement of the device.”

142. Waldman in combination with Kankainen renders obvious claim 8, as discussed above for claim 8.

143. Waldman renders obvious the additional limitations of claim 9.

144. As explained for claim 8, Waldman discloses first indicia (e.g., arrows 312, 314) indicating directions to Buena Vista Park and second indicia (bubble) indicating a distance of 1800m to Buena Vista Park, both integrated with the video. *Supra* § X.A.8 (claim 8); Waldman, [0018], [0021], [0031], [0039], FIG. 3.

145. Waldman discloses or renders obvious updating the first and second indicia based on the movement of the device because Waldman discloses that the device's processor continuously "update[s] the overlaid route" shown on the screen "[a]s the user follows the specified direction." Waldman, [0052], claim 7 (reciting "updat[ing] the illustrated portion of the route as the GPS location of the video capture device changes with movement along the route"). Thus, "[a]s the user and associated device progress along a route, the overlaid directions can automatically update to show the updated path." Waldman, [0007].

146. A POSITA would have understood that "automatically" updating the "illustrated portion of the route," such as "the overlaid directions" as "the user and associated device progress along a route" (during the movement), includes updating the arrows (first indicia) and bubble (second indicia) to reflect the user's current relative location to the first object because they are part of the "route data" constituting the overlaid route. Waldman, [0007], [0021], [0031], [0052], claim 7. Updates would have included, e.g., removing and/or repositioning the arrows in the augmented video after the user "turn[s] left onto Duboce Ave.," updating the distance to Buena Vista Park, and/or updating the size of the indicia based on the "user and associated device['s] progress along the route." Waldman, [0007], [0031].

a. Motivation to Combine

147. To the extent Patent Owner argues that Waldman does not disclose claim 9, a POSITA would have been motivated to update the first and second indicia based on Waldman's disclosure discussed above, because updating overlaid/illustrated directions/portions of the route, including the location and/or content of the arrows and bubble (first and second indicia), would have improved the user's experience by providing real-time directions for reaching the destination and an indication of the destination's proximity, thus helping enable the user to reach their destination efficiently, effectively, and accurately. Such updates would have also provided visual confirmation that the user was progressing along the correct route, providing real-time affirmation that the user was progressing appropriately, and would have also reduced the potential for user confusion or error by removing completed portions of the route. Without such updates, the user would have been bombarded with a mix of completed and upcoming directions or would not have known with certainty that they were going the right way (e.g., turned along the right street in the right direction).

b. Expectation of Success

148. A POSITA would have had a reasonable expectation of success in updating the first and second indicia based on the device's movement because such an implementation would have been routine and merely required the use of

Waldman's existing components (augmented reality application and GPS) to perform a basic, well-known, and conventional function (overlaying an augmented route based on the user's updated location). Updating the first and second indicia based on the device's movement would have been a straightforward application of Waldman's device as evidenced by the prior art. Kankainen, [0075], [0080], FIGS. 6C-6H (updating directional arrows on the overlaid route based on the user's movement along the route); Geelen, [0096] (explaining that the superimposed navigation directions "correspond to the actual location of the change in direction as shown on the feed from the camera"); Ma, [0050], [0061], [0076], [0079] (describing methods for updating overlaid video navigation indicia, wherein the navigation device's GPS and "program" are used to simultaneously track "one or more objects" so that "their locational data may be shown on the view screen as a plurality of arrows 112, labels 113, distances 144[,]and marks 115," and "the size of the indicator/mark may be related to the actual distance between the [objects]," so "the size of the indicator/mark may change as the distance between [objects] changes").

10. [Claim 10] "The method of claim 8 wherein the first indicia includes a direction indicator."

149. Waldman in combination with Kankainen renders obvious claim 8, as discussed above for claim 8.

150. Waldman discloses the additional limitations of claim 10.

151. As discussed for claim 8, Waldman discloses that the first indicia includes a direction indicator, such as direction and turn arrows 312 and 314, which “shows a direction 312 that the user must travel” to reach Buena Vista Park. *Supra* § X.A.8 (claim 8); Waldman, [0018], [0031], [0039], FIG. 3.

11. [Claim 11] “The method of claim 8 wherein the first indicia includes a label.”

152. Waldman in combination with Kankainen renders obvious claim 8, as discussed above for claim 8.

153. Waldman discloses the additional limitations of claim 11.

154. As explained for claim 8, Waldman discloses the first indicia, such as arrows 312, 314 and the street name “Duboce.” *Supra* § X.A.8 (claim 8). The ’215 patent does not define the term “label”; however, a POSITA would have understood that the arrows and/or street names include a label because they are overlaid onto the video and describe how the user should proceed along the route (e.g., straight, left, or right) or identify the navigation points by name. Waldman, [0018], [0031], [0039].

12. [Claim 14] “The method of claim 1 wherein the video includes data reflecting a video capture of surroundings of the first object.”

155. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

156. Waldman discloses the additional limitations of claim 14.

157. As discussed for claim 2, Waldman discloses information “integrated with the video,” including a bubble, street name, and arrows for directing the user towards the first object. *Supra* § X.A.2 (claim 2); Waldman, [0021], [0031], FIG. 3.

158. The '215 patent does not define “surroundings.” *See generally* Ex. 1001. But a POSITA would have understood that Waldman’s augmented video includes data reflecting a video capture of surroundings of Buena Vista Park, the first object, because the data, such as street names and corresponding directions, reflects the video capture by the “onboard camera” and the first object’s (Buena Vista Park) relative geographical location with respect to the device and the device’s field of view. Waldman, [0010], [0025], [0031], FIGS. 2, 3 (illustrating map and video capturing an area surrounding Buena Vista Park).

159. Thus, when the user “points” the smartphone’s camera down Dolores St. “to begin travelling” to Buena Vista Park, “route data” is overlaid onto the corresponding video, which includes the surroundings of Buena Vista Park. Waldman, [0010], [0025], [0031], FIGS. 2, 3. The same is true when the user turns onto Duboce Ave. because the video displayed on the user’s device shows the surroundings of Buena Vista Park as the user travels along the prescribed route and approaches Buena Vista Park. Waldman, [0010], [0025], [0031], FIGS. 2, 3.

13. [Claim 15] “The method of claim 1 wherein the first object includes a location.”

160. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

161. Waldman discloses the additional limitations of claim 15.

162. As explained in [1c] and claim 4, the first object is Buena Vista Park and the '215 patent does not define “location.” *Supra* §§ X.A.1.d, X.A.4 ([1c], claim 4); Waldman, [0031], FIG. 3. A POSITA would have understood that Buena Vista Park is a “point of interest” that has a “location,” as shown in FIG. 2, because it is a geographic position (fixed or otherwise) that the user can navigate to.

Waldman, [0031], FIGS. 2-3.

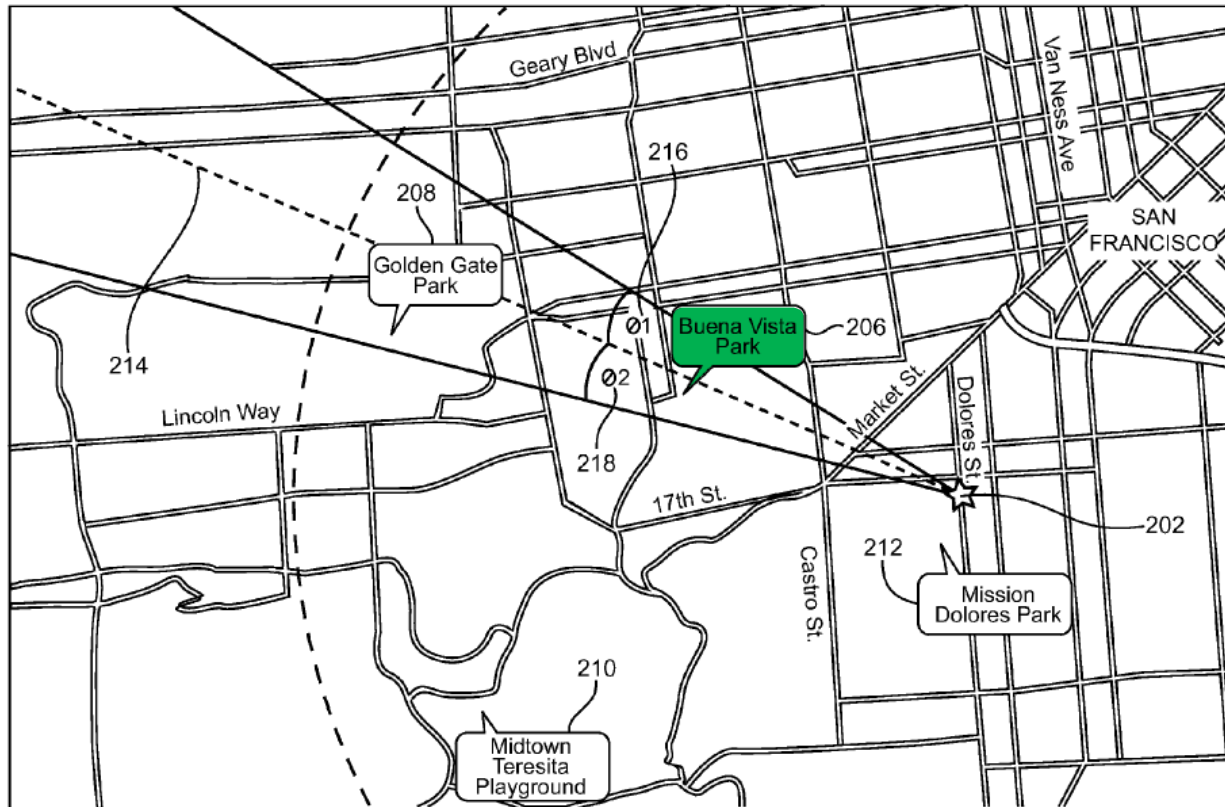


FIG. 2

Waldman, FIG. 2 (annotated).

14. [Claim 16] “The method of claim 1 and further comprising: detecting a change in the movement of the portable electronic device; in response to detecting the change in the movement of the portable device, updating the presentation of the video by the display device of the portable electronic device.”

163. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

164. Waldman discloses the additional limitations of claim 16.

165. As explained above in claims 1 and 9, Waldman detects a change in movement “[a]s the user and associated device progress along a route” and

“automatically update[s]” the video display and corresponding visual augmentations “to show the updated path” and updated “overlaid directions.” Waldman, [0007], [0052] (updating the displayed route and video “[a]s the user follows the specified direction”); *supra* §§ X.A.1, X.A.9 (claims 1, 9). The updated presentation of the video, such as the updated overlaid directions/visual augmentations, is shown, for example, on display 634 of the electronic device. *Supra* §§ X.A.1, X.A.9 (claims 1, 9).

15. [Claim 17] “The method of claim 1 wherein the video is conditionally presented by the display device of the portable electronic device, based on a detected position of the portable electronic device.”

166. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

167. Waldman discloses the additional limitations of claim 17.

168. As explained for [1b] and claim 9, Waldman’s device “capture[s] and display[s] a real-time video stream of [the device’s] view” on the display using location information of the device, such as while the user is en route to Buena Vista Park. *Supra* §§ X.A.1.c, X.A.9 ([1b], claim 9); Waldman, Abstract, [0010], [0011], [0025], [0031].

169. Waldman’s displayed video—both the video itself and visual augmentations—is conditionally presented based upon a detected position of the device because the video changes based on the “geographic position” of the device,

the direction the device is facing, and the location along the prescribed navigational route. Waldman, [0010], [0025], [0031], [0052]. For example, when the user positions the device to face down Dolores St. “to begin travelling” to Buena Vista Park, the position is detected, the video shows Dolores St., and the live view is augmented “[u]sing map data that describes the area surrounding the present location [position] of the device and the [POIs] located in the surrounding area.” Waldman, [0010], [0020], [0025], [0031]. And when the user “turn[s] left onto Duboce Ave.,” the video also conditionally changes based on “updated location and directional information” to “update the overlaid route” or “automatically update to show the updated path.” Waldman, [0007], [0010], [0025], [0031], [0052]; *see also* Waldman, [0040] (explaining that “‘no route’ would be displayed in the [video] display” if the user is facing the wrong direction).

- 16. [Claim 20] “The method of claim 1 wherein the user is directed in the second direction towards the first object which is not initially presented in the video, so that the user is directed to walk in the second direction for directing an attention of the user to the first object.”**

170. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

171. Waldman discloses the additional limitations of claim 20.

172. As discussed for [1d], Waldman discloses directing the user in a second direction (blue) left off of Dolores St. onto Duboce Ave. and towards Buena Vista Park by “visually augment[ing] the captured video stream” with an indicator (e.g., pink arrow 314) on the directional map to Buena Vista Park.

Waldman, [0010], [0031], FIG. 3. As explained for claim 2, this directional map includes the arrow at “turn 314” in the second direction and provides a visual representation of the route, thereby directing the user’s attention to Buena Vista Park. Waldman, [0031], FIG. 3.

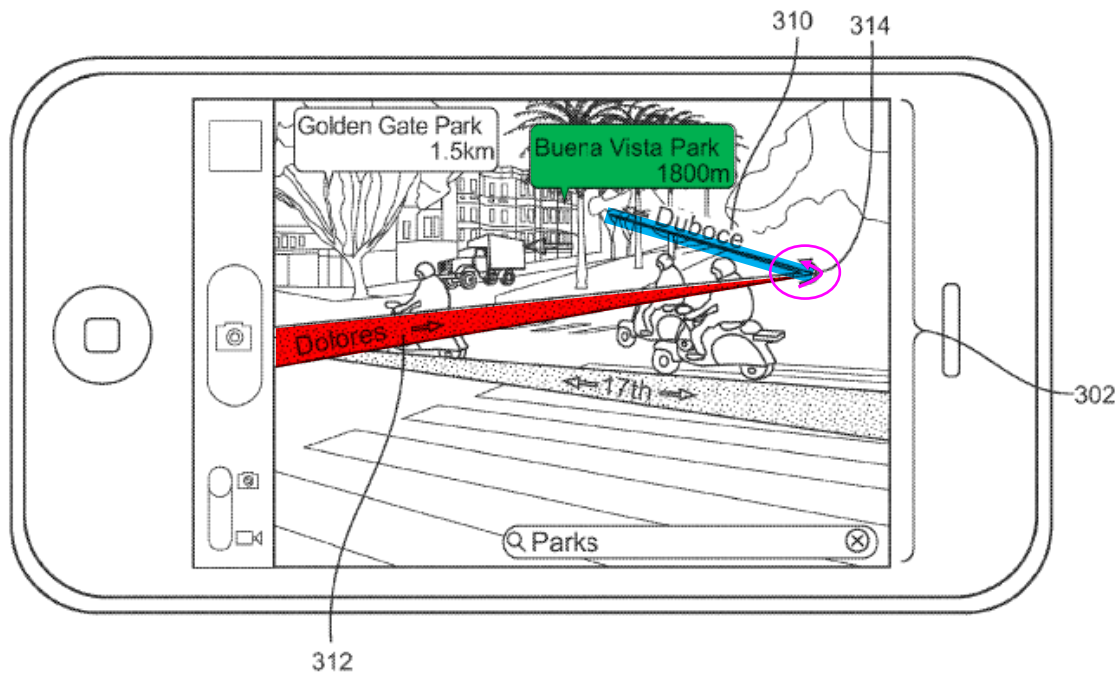


FIG. 3

Waldman, FIG. 3 (annotated).

173. Waldman further discloses that Buena Vista Park is not initially presented in the video because the park itself is “obstructed by other in-screen objects” and therefore not within the viewfinder when the user requests directions to Buena Vista Park. Waldman, [0020].

17. [Claim 21]

a. [21Preamble] “The method of claim 1 and further comprising:”

174. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

175. Waldman, or Waldman in combination with Kankainen, renders obvious additional limitations of claim 21.

b. [21a] “detecting additional movement of the portable electronic device in the second direction, that results from the user walking with the portable electronic device in the second direction;”

176. Waldman, or Waldman in combination with Kankainen, renders obvious that the device’s detected movement results from the user walking, as explained in [1b]. *Supra* § X.A.1.c ([1b]); Waldman, [0031], [0032]; Kankainen, [0023].

177. Waldman further discloses detecting additional movement of the device (e.g., walking) in the second direction when the user “turn[s] left onto Duboce Ave. from Dolores St.” because the device continuously receives “updated location and directional information and video input,” as explained in claims 9 and

16. *Supra* §§ X.A.9, X.A.14 (claims 9, 16); Waldman, [0011], [0020], [0031], [0048], [0052], claim 7.

178. Waldman, or Waldman in combination with Kankainen, also renders obvious detecting “additional movement” resulting from the user walking for the reasons discussed in [1b]. *Supra* § X.A.1.c ([1b]). For example, Kankainen discloses detecting additional movement in the second direction along 19th St. as “the user continues walking along the route,” “[w]hen the user is walking on ... 19th St.,” and “[w]hen the user walks close to the IMF,” and a POSITA would have been motivated to combine Waldman and Kankainen and had a reasonable expectation of success in doing so, as discussed in [1b]. *Supra* § X.A.1.c ([1b]); Kankainen, [0075], [0077], [0079], [0080].

- c. **[21b] “receiving additional video data, that includes the first object, captured by the video capture device during the additional movement of the portable electronic device in the second direction;”**

179. Waldman discloses continuously receiving updated (additional) video data input, captured by the device’s “onboard camera” “[a]s the user follows the specified directions,” during the additional movement along Duboce Ave. Thus, “[a]s the user and associated device progress along a route, the overlaid directions can automatically update to show the updated path” in the displayed video. Waldman, [0007]. A POSITA would have understood that, as explained by Waldman, Waldman’s additional video data includes video of Buena Vista Park

(first object) as the user continues along the prescribed route down Duboce Ave. in the second direction and the park comes into the device's field of view. Waldman, [0007], [0011], [0031], [0032], [0052], claim 7, (describing “visually augment[ing] the captured video stream”); *supra* § X.A.14 (claim 16).

180. To the extent Patent Owner argues that Waldman does not disclose [21b], Kankainen renders it obvious.

181. For example, Kankainen discloses receiving additional video data, including the IMF (first object), as the user walks in a second direction along 19th St. (after turning from H St.) such that “[w]hen the user walks close to the IMF, the user can see the IMF [(green)] on the right hand side” of the displayed video. Kankainen, [0079], FIG. 6H.

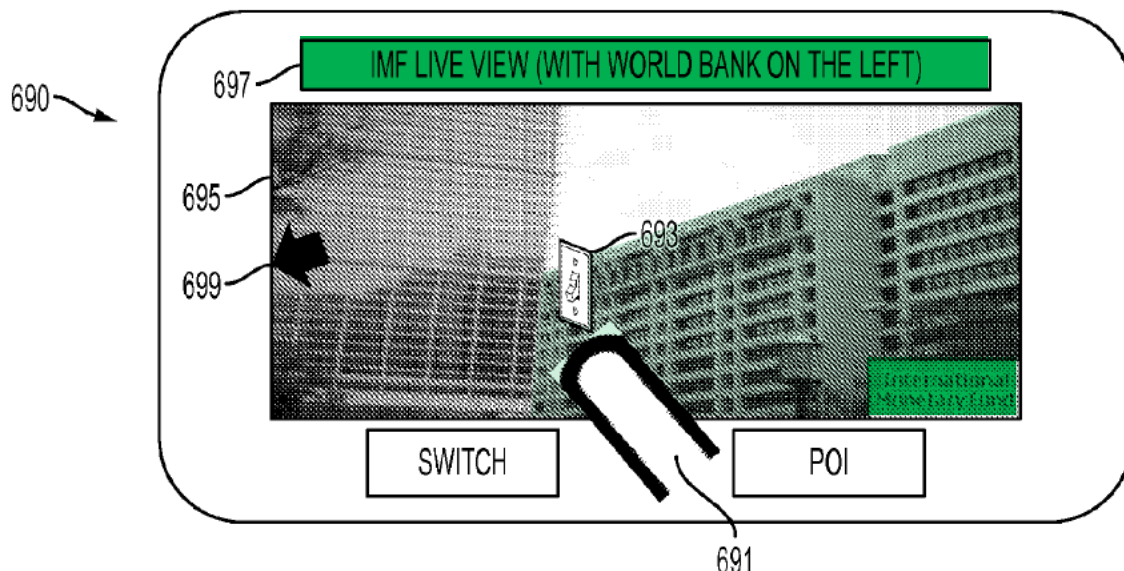


FIG. 6H

Kankainen, FIG. 6H (annotated).

i. Motivation to Combine

182. A POSITA would have found it obvious, and would have been motivated, to modify Waldman to receive additional video data, including the first object (e.g., Buena Vista Park), to show the user the chosen destination. As discussed for claim 9, providing a real-time indication of the destination's proximity and the user's arrival provides visual confirmation that the user is progressing along the correct route and improves the user's experience. *Supra* § X.A.9 (claim 9). Receiving additional video data, including the first object/destination (Buena Vista Park), also enhances the user's experience by making the destinations more easily identifiable, e.g., when the destination's name or street number are not apparent. A POSITA would have been motivated to modify Waldman as discussed for all of these reasons.

ii. Expectation of Success

183. A POSITA would have reasonably expected the modification to succeed because it would have merely required the use of existing components (augmented reality application and GPS, which are disclosed by Waldman) to perform routine functions (presenting additional video data (overlaid route) based on the user's updated location) as discussed in claim 9. *Supra* § X.A.9 (claim 9).

- d. **[21c] “and utilizing the additional video data, presenting additional video by the display device of the portable electronic device that is viewable to the user for directing an attention of the user in connection with the first object that is presented in the additional video.”**

184. Waldman discloses [21c].

185. Waldman discloses presenting additional video on the device’s display screen 634, which is viewable to the user, using additional video data, as explained for claims 9 and 16, and explained in elements [21a]-[21b]. *Supra* §§ X.A.9, X.A.14, X.A.17.b-X.A.17.c (claims 9, 16, [21a]-[21b]); Waldman, [0007], [0052], claim 7. The updated overlaid route, including the bubble identifying the first object and direction arrows to the first object, directs an attention of the user in connection with the first object (Buena Vista Park), as explained for claim 2. *Supra* § X.A.2 (claim 2); Waldman, [0031].

186. To the extent Patent Owner argues that Waldman does not disclose [21c], Kankainen renders it obvious. For example, Kankainen augments the additional video of the IMF building shown in the “live image view” with an icon reading “International Monetary Fund” in the lower corner and a direction bar at the top of the video (**green**), which direct the attention of the user in connection with the first object by verifying the arrival at the first object, as shown in FIG. 6H. Kankainen, [0080].

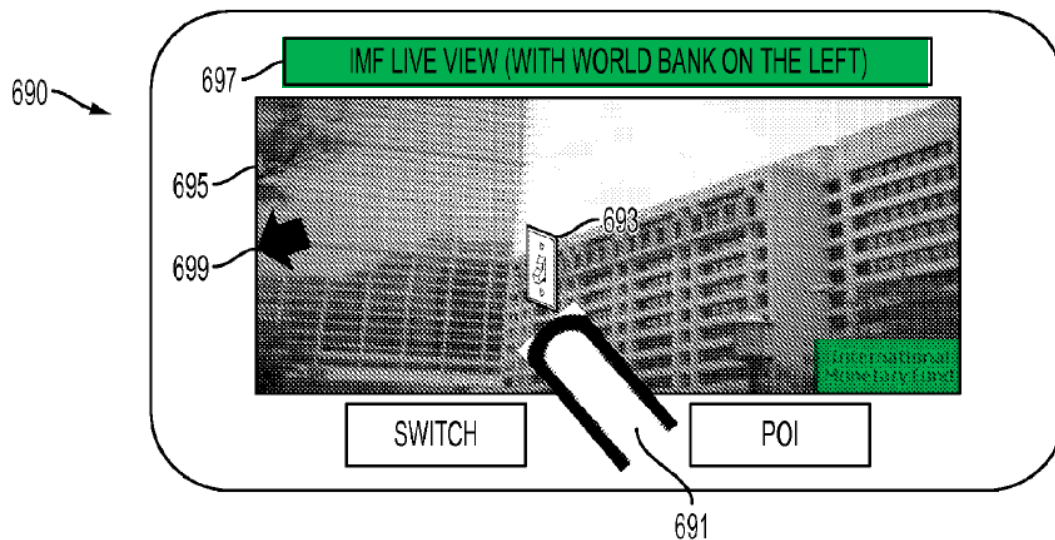


FIG. 6H

Kankainen, FIG. 6H (annotated).

i. Motivation to Combine

187. A POSITA would have found it obvious to modify Waldman to present additional video including Buena Vista Park and for directing the user's attention in connection with Buena Vista Park, to show the user the chosen destination for the reasons discussed for [21b]. *Supra* § X.A.17.c.i ([21b] Motivation to Combine).

ii. Expectation of Success

188. A POSITA would have had a reasonable expectation in making the modification for the reasons discussed for [21b]. *Supra* § X.A.17.c.ii ([21b] Expectation of Success).

18. [Claim 22] “The method of claim 1 wherein information is integrated with the video, the information being received via a data store including location information for objects with fixed locations.”

189. Waldman in combination with Kankainen renders obvious claim 1, as discussed above for claim 1.

190. Waldman discloses the additional limitations of claim 22.

191. As discussed for claims 2-3, Waldman discloses information integrated with the video, e.g., a street name and the first object’s “relative geographic position” (bubble) that have fixed locations, for directing the user towards the first object. Waldman, [0021]. Waldman also discloses receiving the information from a “map database,” which is a data store, that includes the location information of fixed locations, such as Buena Vista Park, Golden Gate Park, Dolores St., and Dubose Ave. Waldman, [0021], [0027], [0028], [0036], [0037].

192. For example, when the user searches for “Parks,” the “device sends a request for data related to nearby parks to a map database,” which may be on a “server” or in memory on the device (data store), that “return[s] search results for [POIs] related to the search term that are also within a defined radius of the handheld communication device.” Waldman, [0027], [0028], [0036], [0046].

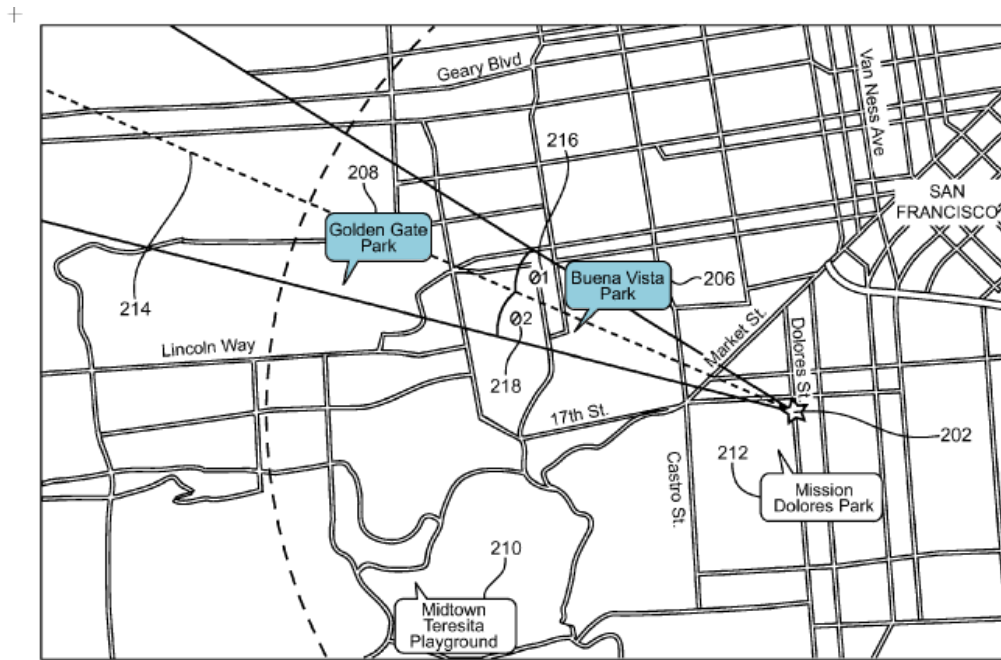


FIG. 2

Waldman, FIG. 2 (annotated).

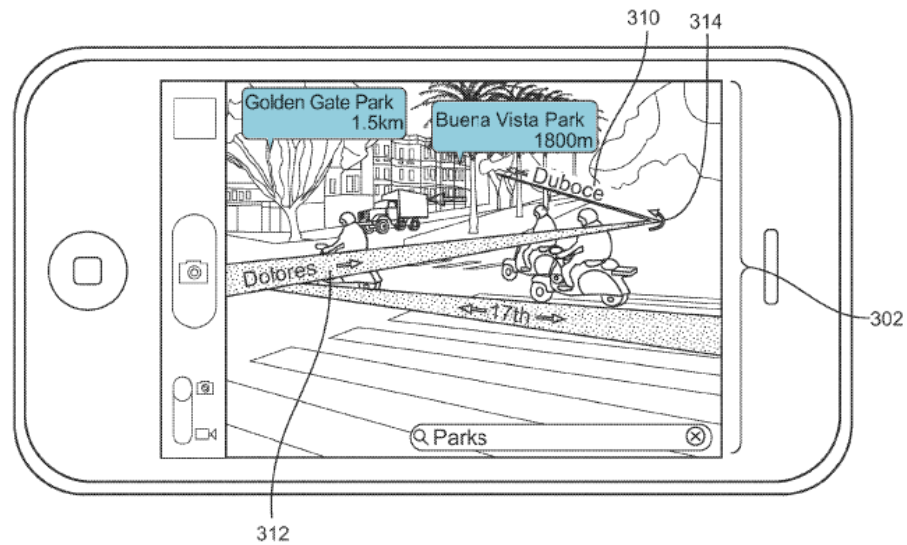


FIG. 3

Waldman, FIG. 3 (annotated).

19. Independent Claim 18

193. Independent claim 18 is directed to a portable electronic device for performing the method of claim 1. Claim 18 is obvious over Waldman alone or in combination with Kankainen for the reasons discussed for claim 1.

a. [18Preamble] “A portable device, comprising:”

194. To the extent the preamble is limiting, Waldman discloses a portable electronic device, for example, a “handheld communication device,” such as a smartphone. Waldman, Abstract, [0031], [0045], [0054].

b. [18a] “a display device;”

195. Waldman discloses element [18a]. Waldman’s device includes a display screen 634 (blue). Waldman, [0010], [0045], FIGS. 1, 3, 6.

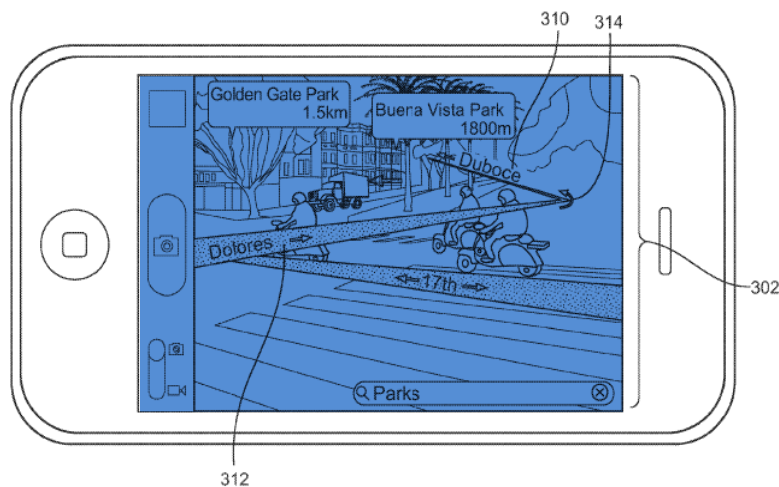
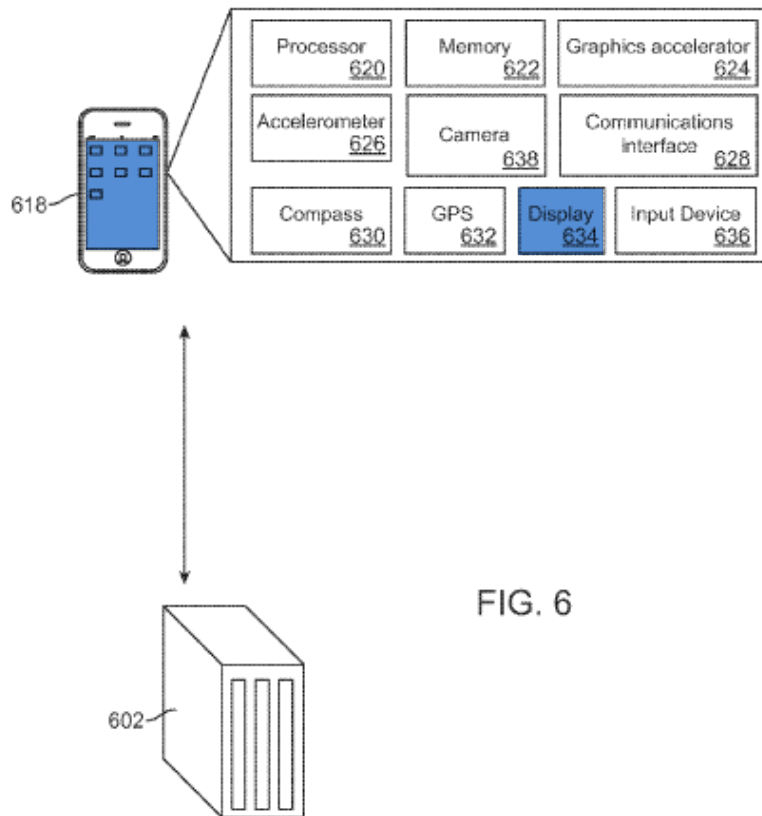


FIG. 3

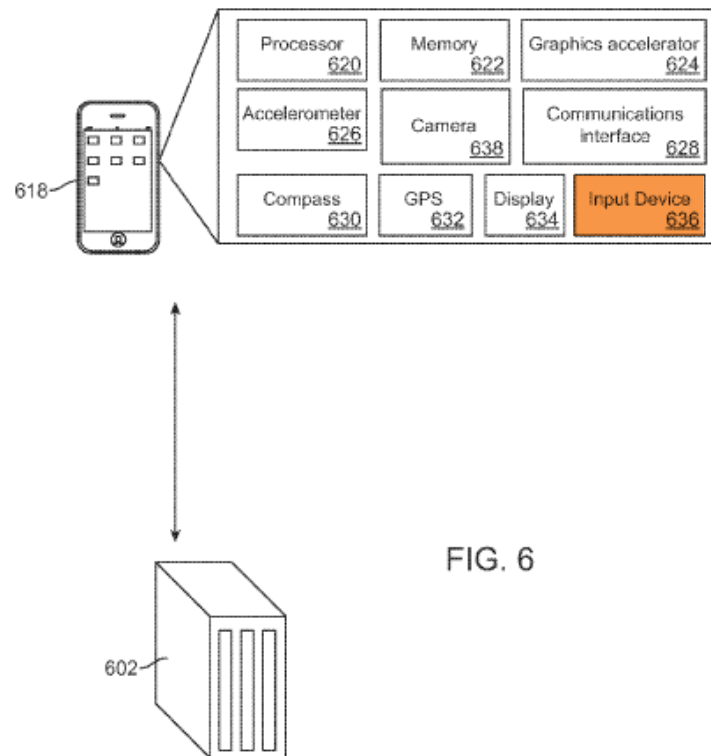
Waldman, FIG. 3 (annotated).



Waldman, FIG. 6 (annotated).

c. [18b] “an input device;”

196. Waldman discloses element [18b]. Waldman’s device includes an “input device” 636 (orange), such as a touch screen, used for selecting “from among objects represented on the screen, including the search results.” Waldman, [0006], [0021], [0045], FIG. 6.



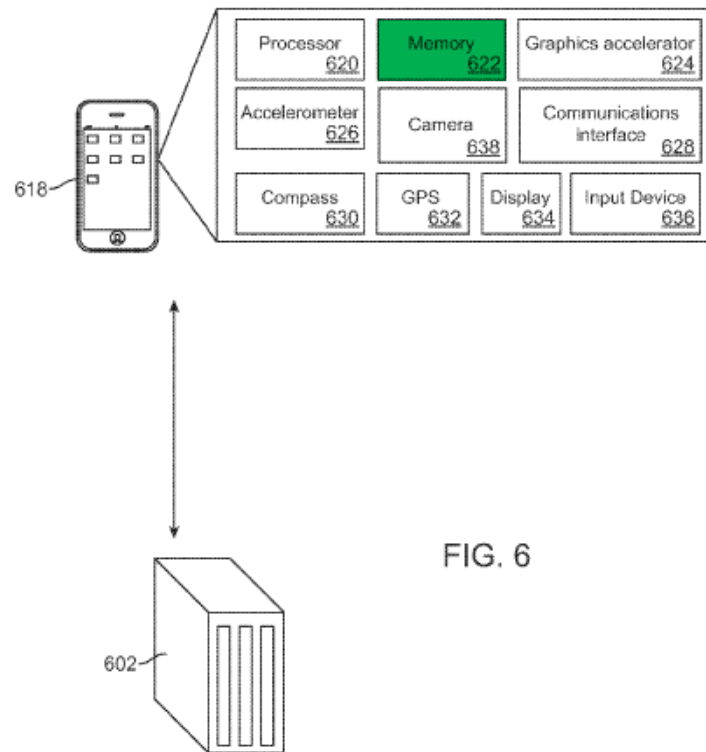
Waldman, FIG. 6 (annotated).

d. [18c] “at least one non-transitory memory storing instructions;”

197. Waldman discloses element [18c].

198. Waldman’s device includes “memory 622” (green). Waldman, [0045], [0053], [0055]. Waldman explains that the methods are “implemented using computer-executable instructions that are stored” on the computer-readable media, which is non-transitory, because “[e]xamples of computer-readable media that may be used to store instructions” include “magnetic or optical disks, flash memory, USB devices provided with non-volatile memory,” and other storage media.

Waldman, [0053], [0055].

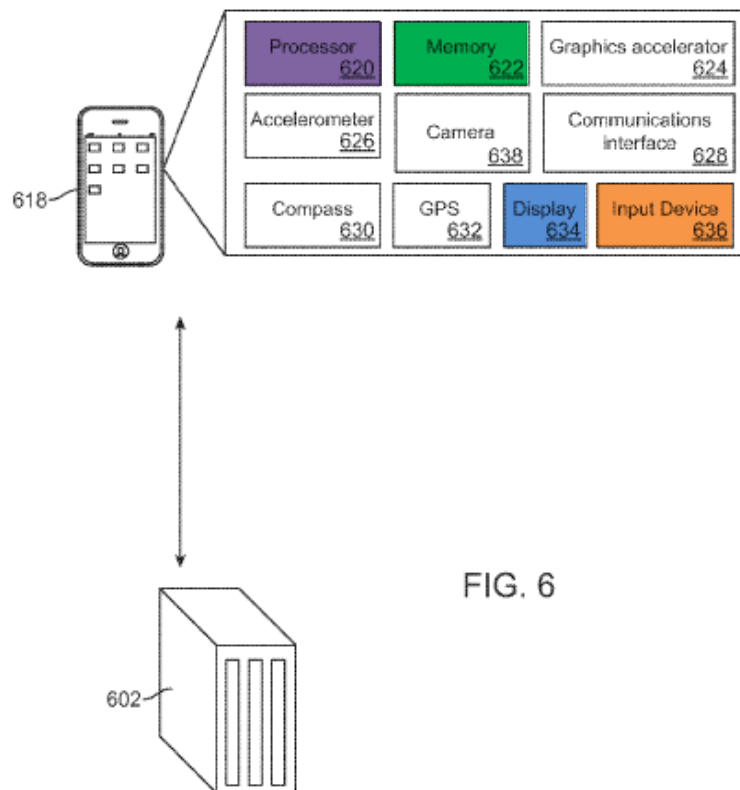


Waldman, FIG. 6 (annotated).

- e. [18d] “and one or more processors in communication with the display device, the input device, and the at least one non-transitory memory,”

199. Waldman discloses element [18d].

200. Waldman’s device includes a processor 620 (purple) that communicates with display device 634 (blue) by interpreting “map data to generate and display a route over the displayed image for guiding the user to a destination (selected [POI]).” Waldman, [0051].



Waldman, FIG. 6 (annotated).

201. Waldman's processor communicates with the input device (636) (orange) because "instructions are input ... through an input device 636 [e.g., touch screen 634] that instructs the processor 620 to execute functions in an augmented reality application." Waldman, [0047], [0051]. The processor also communicates with memory 622 (green) because the memory stores "instructions and data which cause or otherwise configure [the device] to perform a certain function or group of functions," and the processor "execute[s] [the] functions in the augmented reality application." Waldman, [0047], [0053], [0055].

- f. **[18e] “wherein the one or more processors execute the instructions to cause the portable electronic device to:”**

202. Waldman discloses that the processor executes the instructions to perform the steps recited in elements [18f]-[18i].

203. Waldman’s processor and memory “provid[e] the functions described in this disclosure,” and the processor “execute[s] [the] functions in [the] augmented reality application,” such as receiving video and location data, interpreting map data, and generating and updating the displayed route. Waldman, [0047], [0051]-[0053], [0055].

- g. **[18f] “detect a movement of the portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”**

204. Waldman, or Waldman in combination with Kankainen, renders obvious element [18f] for the reasons discussed for [1a]. *Supra* § X.A.1.b.

- h. **[18g] “receive video data captured in a first direction by a video capture device during the movement,”**

205. Waldman discloses element [18g] for the reasons discussed for [1b]. *Supra* § X.A.1.c.

- i. **[18h] “where a first object is in a second direction;”**

206. Waldman discloses element [18h] for the reasons discussed in [1c]. *Supra* § X.A.1.d.

- j. **[18i] “and present a video by the display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”**

207. Waldman discloses element [18i] for the reasons discussed for [1d].

Supra § X.A.1.e.

20. Independent Claim 19

208. Independent claim 19 is directed to non-transitory computer-readable media storing instructions for causing a portable electronic device to perform the method of claim 1. Claim 19 is obvious over Waldman alone or in combination with Kankainen for the reasons discussed for claim 1.

- a. **[19Preamble] “A non-transitory computer-readable media storing computer instructions that, when executed by one or more processors of a portable electronic device, cause the portable electronic device to:”**

209. To the extent the preamble is limiting, Waldman discloses it for the reasons discussed for [18c] and [18e]. *Supra* §§ X.A.19.d, X.A.19.f ([18c], [18e]); Waldman, [0047], [0051]-[0053], [0055].

- b. **[19a] “detect movement of the portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”**

210. Waldman in combination with Kankainen renders obvious element [19a] for the reasons discussed for [1a]. *Supra* § X.A.1.b.

- c. **[19b] “receive video data captured in a first direction by a video capture device during the movement,”**

211. Waldman discloses element [19b] for the reasons discussed for [1b].

Supra § X.A.1.c.

- d. **[19c] “where a first object is in a second direction;”**

212. Waldman discloses element [19c] for the reasons discussed for [1c].

Supra § X.A.1.d.

- e. **[19d] “and present a video by a display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”**

213. Waldman discloses element [19d] for the reasons discussed for [1d].

Supra § X.A.1.e.

B. Ground 2: Waldman and Kankainen, and Further in View of Ohnishi, Render Obvious Claims 12 and 13

1. **[Claim 12] “The method of claim 1 wherein tactile feedback is output simultaneously with the presentation [of] the video, the tactile feedback being output based on a location of the first object.”**

214. Waldman in combination with Kankainen, and further in view of Ohnishi, renders obvious claim 12, as discussed above for claim 12.

215. Claim 12 would have been obvious over Waldman in combination with Kankainen, as discussed for claim 1, and further in view of Ohnishi.

216. Ohnishi discloses a “pedestrian navigation device,” such as “a mobile phone,” having “a vibrating unit 17” for generating “a vibration guide,” to provide

tactile feedback, and a “display unit 15” for displaying the pedestrian’s “present position information” and navigation route during the vibration. Ohnishi, [0063], [0068], [0094], [0117], [0119], [0128]-[0133] (describing vibration patterns based on the user’s location from a guide point). As the user proceeds along a prescribed route to a selected destination, the phone vibrates using a particular “vibration pattern” based on the user’s location along the route, producing a “vibration pattern” as the user approaches a “guide point,” and an “arrival pattern” when the user arrives at “the destination.” Ohnishi, [0128], [0144].

217. A POSITA would have found it obvious to incorporate Ohnishi’s vibration-generating tactile feedback output based on the location of a first object (user’s destination) simultaneously with the presentation of the video showing the navigational route because it is “preferable” to provide guidance “through non-visual means” “[i]n addition to the guiding method by which visual images are shown on the display screen.” Ohnishi, [0016].

a. Motivation to Combine

218. A POSITA would have been motivated to incorporate Ohnishi’s tactile feedback simultaneously with the video display into Waldman’s augmented navigation to “provide[] a convenient means of obtaining information regarding distance and travel directions to a certain destination ..., thereby facilitating verification of the information presented,” and to provide direction information and

arrival verifications that do not require the user to look at or verify the video, thereby enhancing user convenience and experience. Ohnishi, [0001], [0018], [0061]. Such a modification would have also enhanced the user's experience by ensuring timely notification to the user, for example, when the user is not looking at the presented display, possibly because of distraction or because the user is looking at the surroundings for a landmark shown in the augmented video. This would also have improved user safety, e.g., by allowing the user to periodically look away from the displayed route for oncoming traffic or obstacles while still receiving notifications regarding their position along the route and navigation directions.

b. Expectation of Success

219. A POSITA would have had a reasonable expectation of success in configuring Waldman's device to provide tactile feedback output with the video based on the location of the first object, such as a vibration "arrival pattern" or guide point-based vibration, because the modification would have only required the integration of known, conventional components (vibrating units for mobile devices) for use in accordance with their known functions (vibrating) to yield predictable and expected results of vibrating the device. Ohnishi, [0128]-[0133], [0144]. Furthermore, it was known in the art to combine tactile and visual feedback to enhance user navigation. *See, e.g.*, Kankainen, [0065] (combining vibrational

tactile feedback with the video navigational component); Ma, [0083]-[0084] (also describing methods for directing a user to a POI using overlaid video navigation, and wherein vibrational tactile feedback is used to supplement the video navigational component).

2. [Claim 13] “The method of claim 1 wherein tactile feedback is output simultaneously with the presentation [of] the video, the tactile feedback being output based on a movement of the portable electronic device.”

220. Waldman in combination with Kankainen, and further in view of Ohnishi, renders obvious claim 13, as discussed above for claim 13.

221. Claim 13 would have been obvious over Waldman in combination with Kankainen, as discussed for claim 1, and further in view of Ohnishi.

222. As discussed for claim 12, Ohnishi discloses and renders obvious providing tactile feedback, such as a “vibration pattern” or “arrival pattern,” based on the movement of the electronic device (e.g., change in detected location), for example, when the device is detected moving towards or arriving at a “guide point” along the route or arriving at “the destination.” *Supra* § X.B.1 (claim 12); Ohnishi, [0128]-[0133], [0144].

223. A POSITA would have been motivated to include Ohnishi’s tactile feedback based on the movement of the electronic device simultaneously with the video navigation in Waldman’s system, as recited in claim 13, for the reasons discussed in claim 12. *Supra* § X.B.1 (claim 12).

C. Ground 3: Kankainen Discloses or Renders Obvious Claims 1-7 and 14-22

1. Independent Claim 1

224. Kankainen discloses or renders obvious claim 1.

a. [1Preamble] “A method, comprising:”

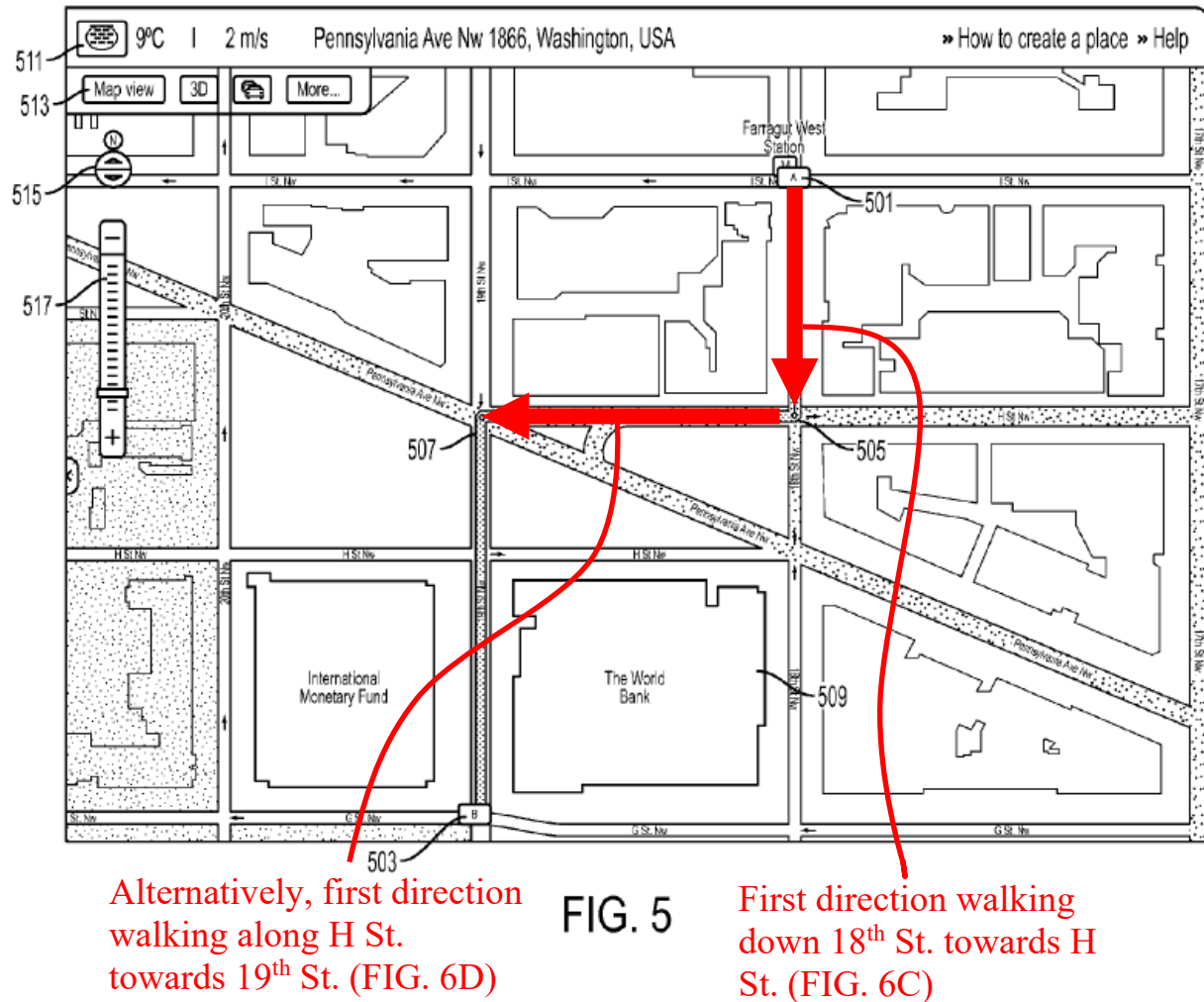
225. To the extent the preamble is limiting, Kankainen discloses it because Kankainen discloses methods of using “a mapping and augmented reality application” to provide “walking” directions from a user’s “current location to a POI.” Kankainen, [0034], [0042], [0075].

b. [1a] “detecting a movement of a portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”

226. Kankainen discloses detecting movement of a “mobile terminal” or “user equipment (UE),” resulting from a user walking with the device from a “current location,” such as Farragut West Metro Station, in a first direction towards a POI such as the International Monetary Fund (“IMF”). Kankainen, [0034], [0042], [0047], [0073]-[0075].

227. The route between Farragut West Metro Station and the IMF includes numerous streets and turns, and the UE’s (portable device’s) movement is detected “[w]hen the user starts walking on the route” in a first direction down 18th St. towards the cross section of 18th St. and H St., and, in the alternative, “as the user

continues walking along the route” in a first direction² along H St. towards the cross section of H St. and 19th St. Kankainen, [0034], [0075], FIGS. 6C-6D.



Kankainen, FIG. 5 (annotated).

² “First direction” appears only in the claims, which require only that the “first direction” precedes a “second direction.”

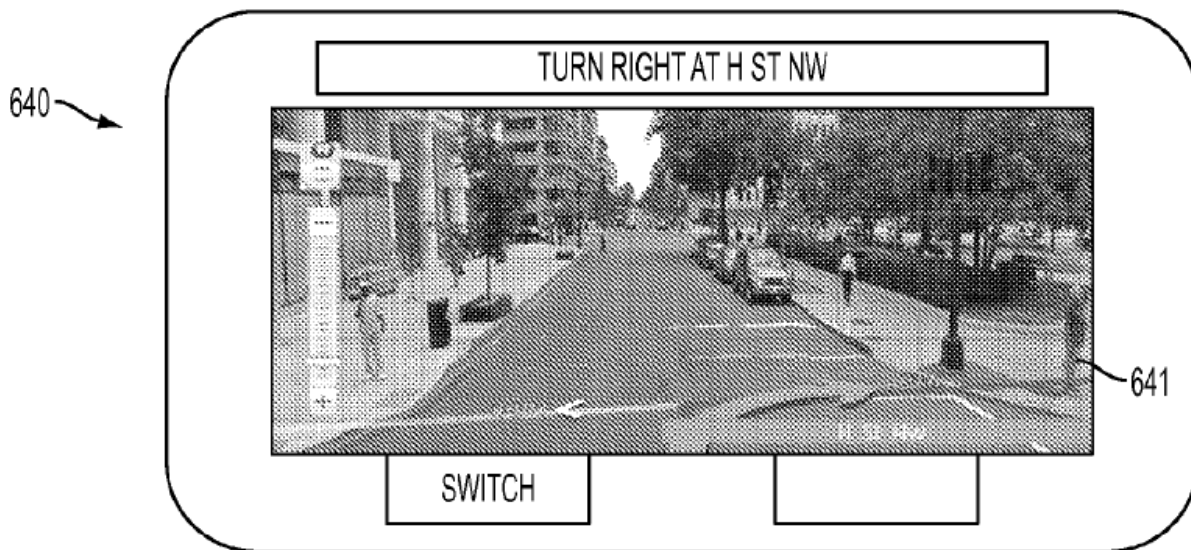


FIG. 6C

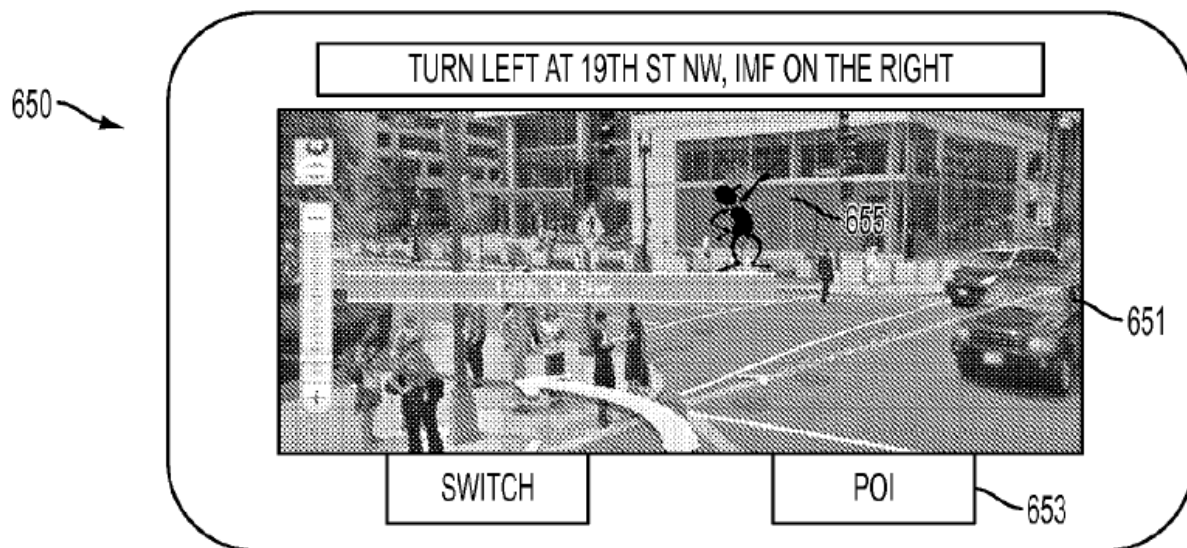


FIG. 6D

Kankainen, FIGS. 6C-6D.

228. The UE's movement and location are detected using GPS satellites 119, which "determine the location of the UE 101" and provide "location data of

the current location of the UE” using “geographic coordinates (e.g., GPS coordinates) or other indicators (e.g., longitude and latitude information)” associated with the current location of the UE. Kankainen, [0044], [0052], [0053] (listing additional location detection methods).

c. [1b] “receiving video data captured in a first direction by a video capture device during the movement,”

229. Kankainen discloses receiving a “live image” (also called a “live view” or “live camera view”) using a “video camera” of the UE, “[a]s the user continues walking along the route” in the first direction down 18th St. towards H St. or, in the alternative, down H St. towards 19th St. Kankainen, [0019], [0034], [0051], [0074], [0075], [0082]; *see also* Kankainen, [0021] (“existing augmented reality, navigation, mapping, and other like services and systems display ... a live camera view”).

230. Kankainen makes clear that the received and displayed “live view” video is distinct from “still” images or “prerecorded” images. Kankainen, [0019] (“embodiments are described with respect to a live camera view,” but “a still image” is “contemplated”), [0074] (describing “a live view of the current[] location side-by-side with the correlated prerecorded panoramic image of the destination”), [0077]-[0078] (“world bank *live view*” versus “world bank *prerecorded panoramic view*” (emphases added)), [0081] (“user can *switch from the correlated prerecorded panoramic image 681 of the IMF in FIG. 6G to a live*

image 695” (emphases added)), FIGS. 6E-6F. A POSITA would have understood that Kankainen’s “live view” describes a video because it displays the video image received in real time (live) during movement of the UE. Kankainen, [0019], [0034], [0039], [0074], [0075], [0080]. Furthermore, a POSITA would have found it obvious to receive and display a live video (instead of a still image or a prerecorded image) captured in the first direction to reflect the video camera’s input and to provide the user with real-time navigation guidance. Such real-time video guidance would have improved the user’s experience by providing a continuous display of the user’s surroundings and navigational guidance that would have minimized the need for additional image capture/user interaction that would have otherwise been required to navigate with still images. A POSITA would have been motivated to capture and display video data of a real-time video stream because using a video would have been preferable over prerecorded images that could lag behind the user and might not have necessarily reflected the user/device’s current point of view. The lag and imprecision could have caused user confusion because the device’s display and navigational guidance would not have reflected the user’s view, whereas a video would have continuously displayed the current surrounding and navigation, thereby improving the user’s experience by providing clearer, more timely navigation. Reduced user interaction would have also minimized user error that may have been caused by delayed still image

capture, imprecise prerecorded video viewpoints, or the user's inability to correlate the still image and/or captured images with the user's real-time point of view. A POSITA would have reasonably expected to succeed in implementing Kankainen to receive video data captured in a first direction by a video capture device during the movement because providing augmented navigational directions over video data captured by a mobile device's video camera was well known and applied only routine functions known to a POSITA. Waldman, [0010], [0031], [0034]-[0039], FIGS. 3-4; Geelen, [0071], [0111], [0117], FIGS. 6, 10, 11; Ma, [0096]. Kankainen thus discloses or renders obvious receiving video data (corresponding to the live view) captured by a "video camera" during the movement in a first direction "[a]s the user continues walking along the route" down 18th St. or H St. Kankainen, [0019], [0051], [0074], [0075], [0082], FIGS. 6C-6D.

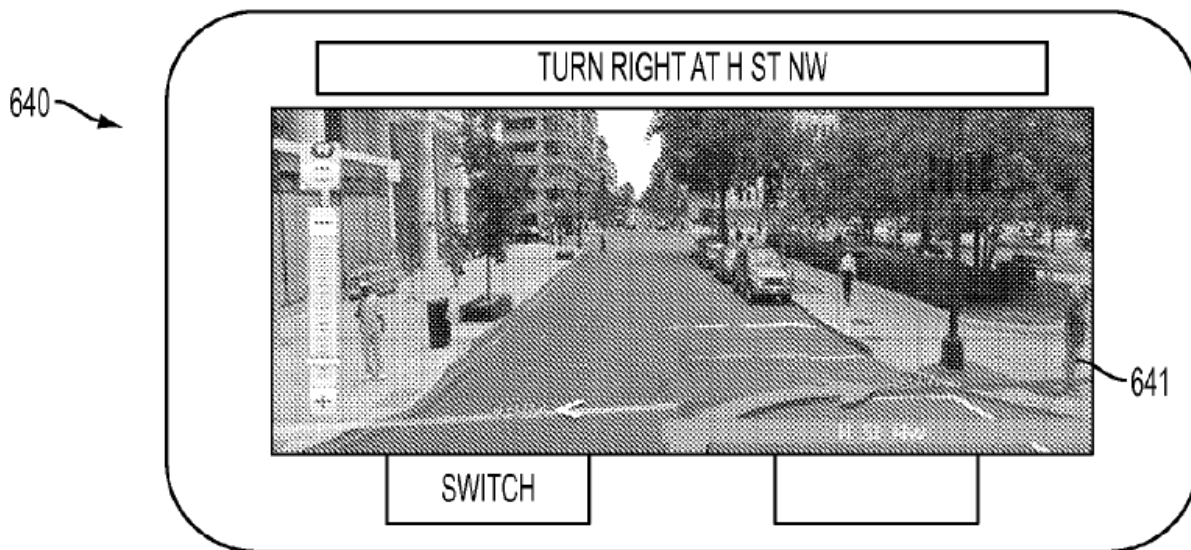


FIG. 6C

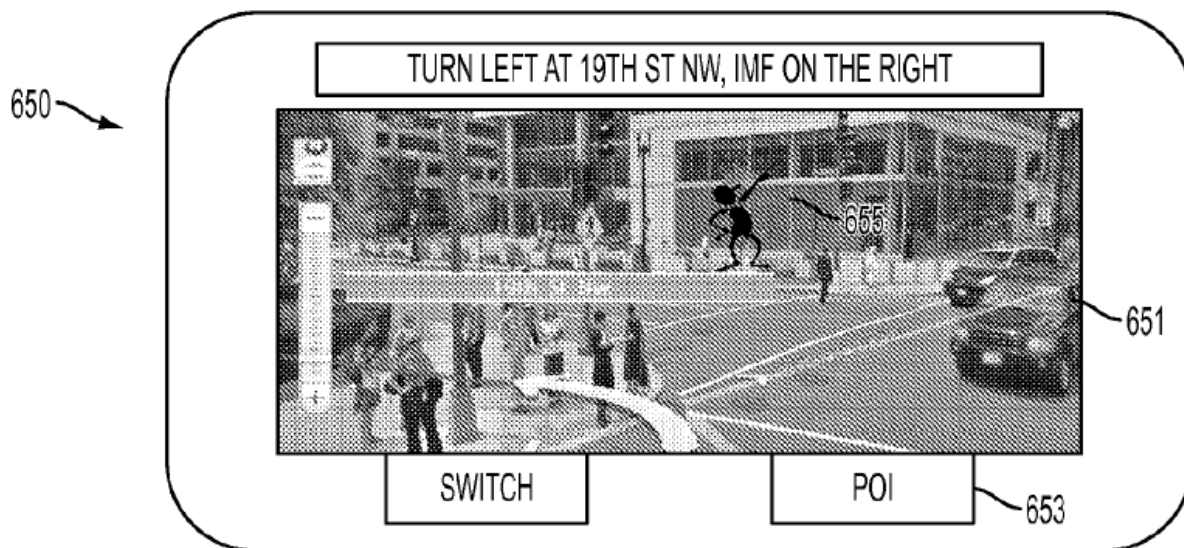


FIG. 6D

Kankainen, FIGS. 6C-6D.

231. As with Ground 1, I have also been asked to consider interpretations of “a first direction” in element [1b] where the first direction is either (1) the

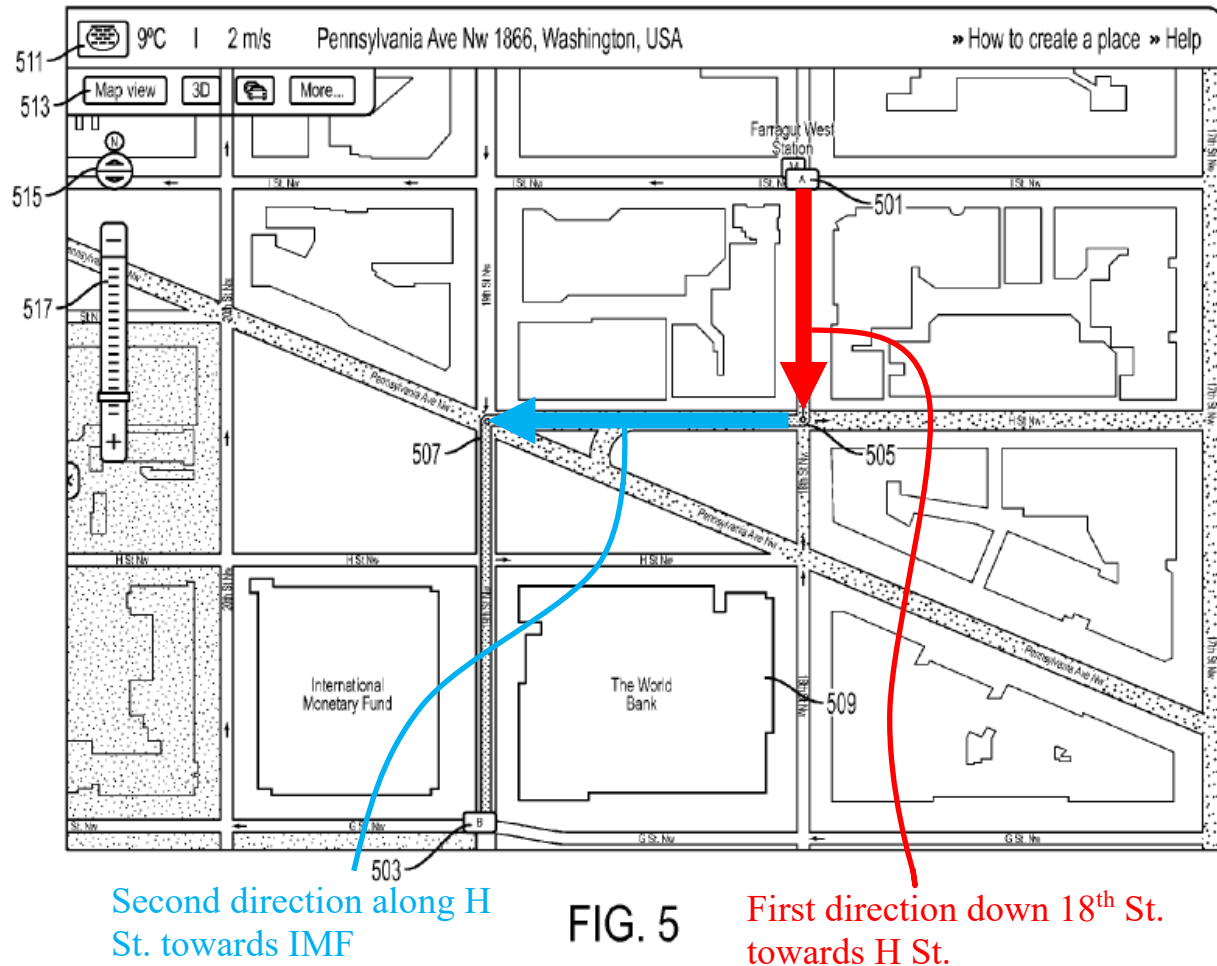
direction the user is walking in [1a] or (2) the direction the video capture device is pointing, which may be different “first direction[s].” In my opinion, Kankainen teaches or renders obvious both meanings, including for the reasons explained above. Kankainen, for example, discloses receiving video data captured during the device’s movement when (1) the user walks in the first direction of element [1a], such as down 18th St. or down H St, as explained above, and (2) the direction the video capture device is pointing, such as while the user is walking down 18th St. or H St., because Kankainen’s device uses a “video camera” to display a “live image” “[a]s the user continues walking along the route” that includes the “direction line 623 with an arrow” in the direction the video camera is pointing. Kankainen, [0019], [0034], [0051], [0074]-[0075], [0082], FIGS. 6B-6D.

d. [1c] “where a first object is in a second direction;”

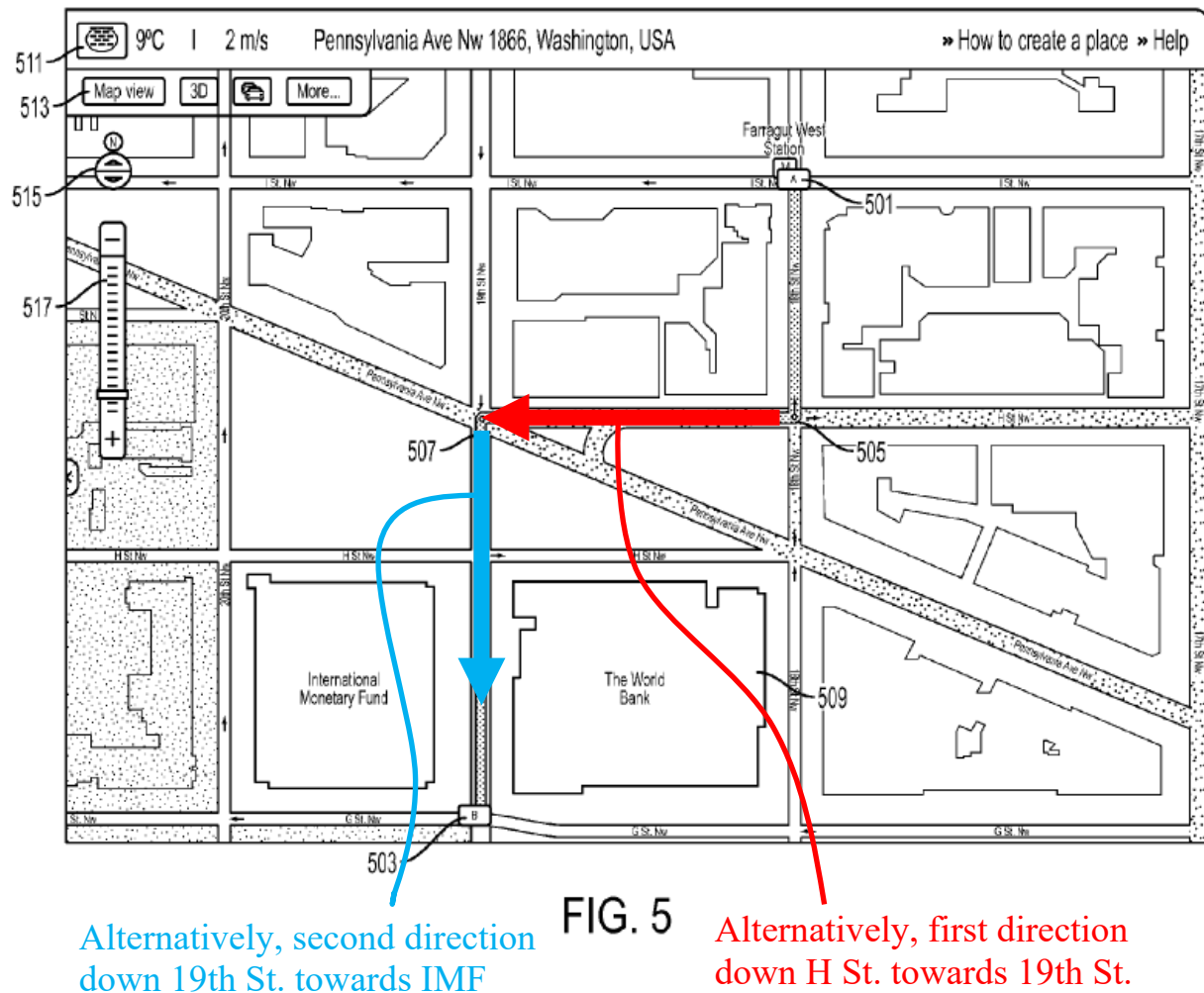
232. As discussed in [1a]-[1b], Kankainen discloses providing a navigational route to a user walking from Farragut West Metro Station to the IMF (first object) using augmented video captured while the user is walking in a first direction down 18th St. or H St. *Supra* §§ X.C.1.b-X.C.1.c ([1a]-[1b]).

233. Kankainen further discloses that the IMF (first object) is in a second direction with respect to the first direction because the user must turn from the first direction (down 18th St.) in a second direction (right onto H St.) or, in the alternative, from the first direction (down H St.) in a second direction (left onto

19th St.) to advance towards the first object (IMF), as illustrated in annotated FIG. 5 below. Kankainen, [0073], [0075], FIGS. 5, 6C-6D.



Kankainen, FIG. 5 (annotated).



Kankainen, FIG. 5 (annotated).

234. Specifically, Kankainen discloses that “as the user continues walking” in the first direction down 18th St., the user reaches a “turning point located at the cross section of ... H St. and ... 18th St.” and an instruction to “turn right at H St[.] NW” in a second direction (blue) onto H St. towards the IMF, as shown in annotated FIG. 6C below. Kankainen, [0073], [0075].

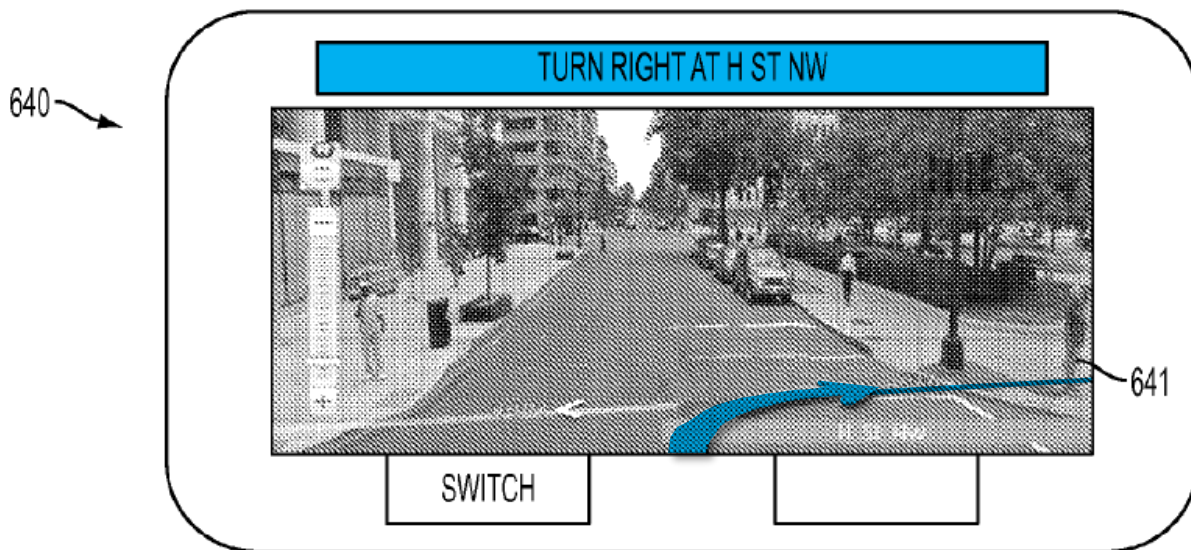


FIG. 6C

Kankainen, FIG. 6C (annotated).

235. Alternatively, “[a]s the user continues walking along the route” down H St. to the IMF (first object) located on 19th St., the user reaches the “turning point located at the cross section of ... H St. and ... 19th St.,” with an instruction to “turn left at 19th St[.] NW” in a second direction (blue) towards the IMF, as shown in annotated FIG. 6D below. Kankainen, [0073], [0075], FIG. 6D.

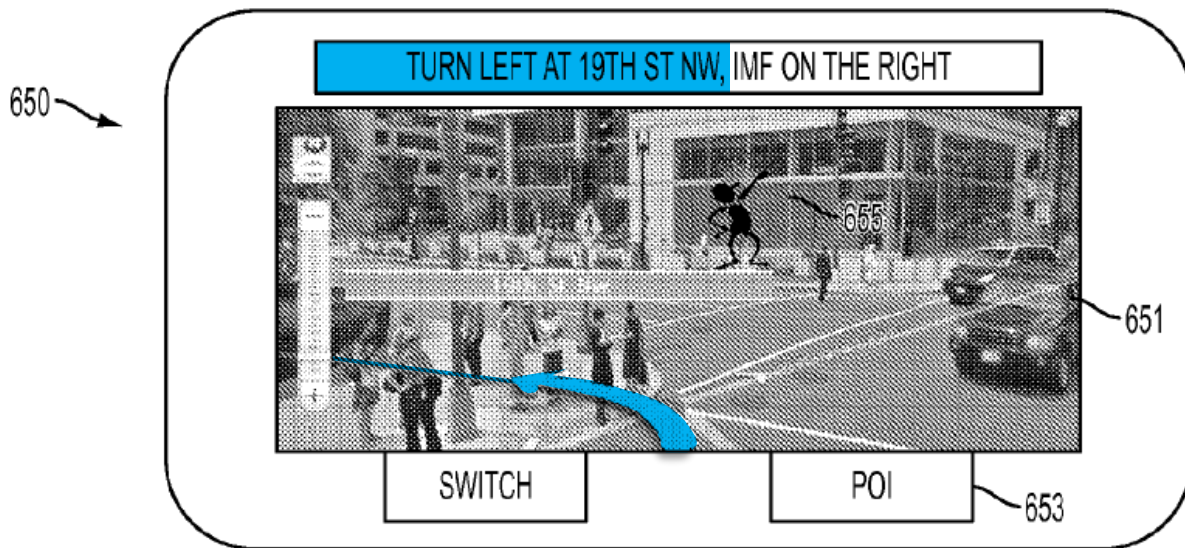


FIG. 6D

Kankainen, FIG. 6D (annotated).

- e. [1d] “and presenting a video by a display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”

236. As explained for [1b], Kankainen receives video data and a corresponding video captured by the “video camera” as a “live image,” “live view,” or “live camera view.” Kankainen, [0019], [0074], [0075], [0082]; *supra* § X.C.1.c ([1b]).

237. The video/live view is presented using a display device (e.g., “screen” or “display device” 714 or “display unit” 907) and is viewable to the user “[a]s the user continues walking along the route” (*see* Kankainen, FIGS. 6A, 6C-6D, 6H) and directs the user in a second direction towards the IMF, by incorporating “3D

objects or other representations of content and related information,” such as “turning points” that direct the user “walking along the route,” into the live video view. Kankainen, [0043], [0073], [0075], [0089], [0103]; *supra* § X.C.1.c ([1b]).

238. For example, Kankainen discloses that “as the user continues walking” in the first direction down 18th St., the user reaches a “turning point located at the cross section of ... H St. and ... 18th St.,” and the “live camera view” shows a right arrow directing the user to “turn right at H St[.] NW” in a second direction (blue) towards the IMF, as shown in annotated FIG. 6C below. Kankainen, [0051], [0073], [0075]. The second direction is towards the IMF because it brings the user closer to the IMF. Kankainen, [0075], FIG. 6C.

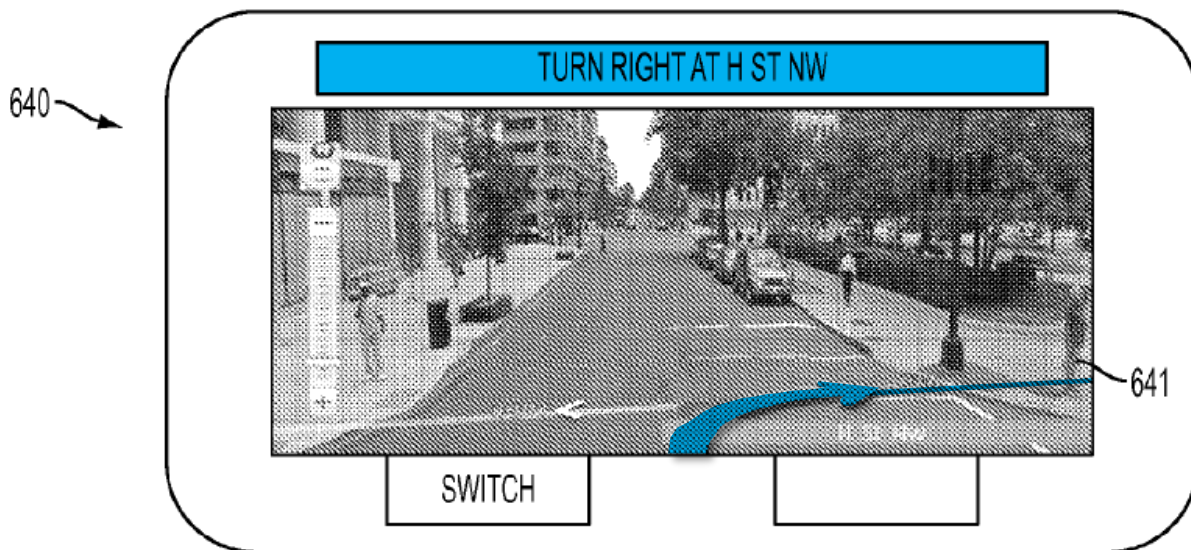
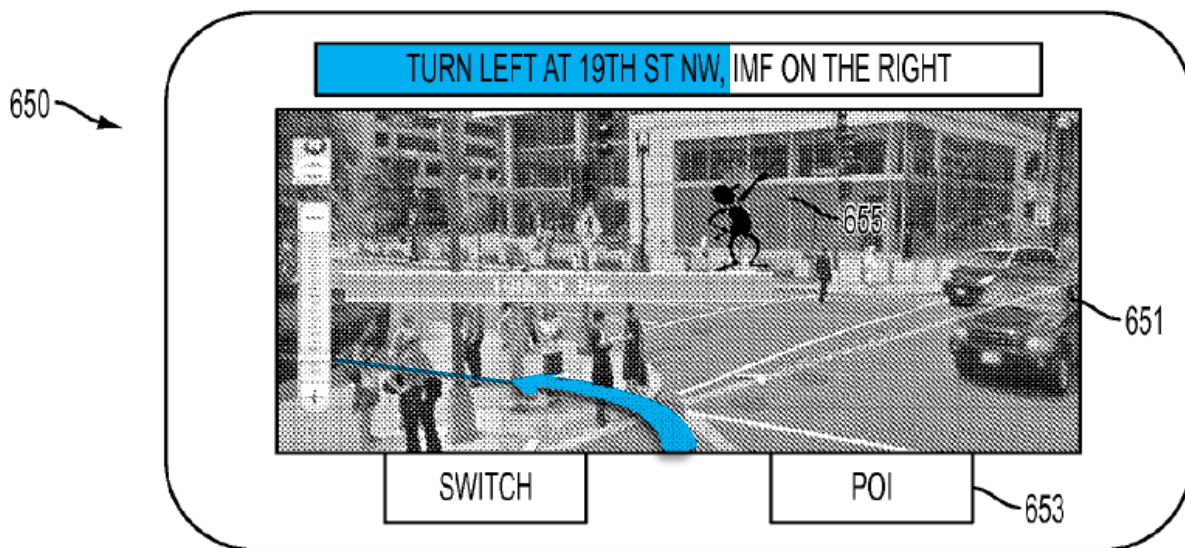


FIG. 6C

Kankainen, FIG. 6C (annotated).

239. Alternatively, “[a]s the user continues walking along the route” down H St., the user reaches the “turning point located at the cross section of ... H St. and ... 19th St.,” and the “live camera view” shows a left arrow directing the user to “turn left at 19th St[.] NW” in a second direction (blue) towards the IMF, as shown in annotated FIG. 6D below. Kankainen, [0051], [0073], [0075], FIG. 6D.



Kankainen, FIG. 6D (annotated).

240. As I explain above in Ground 1, element [1d], I have also been asked to consider interpretations of “a second direction” in element [1d] if it is interpreted to mean (1) a second direction that the user is walking in, (2) a second direction that the camera is pointing in, or (3) a second direction for navigating the user towards the first object (e.g., turn left). In my opinion, Kankainen teaches each interpretation. For example, Kankainen satisfies interpretations (1) and (2)

because it discloses the “direction line 623 with an arrow” showing the user’s navigational route in the augmented video in a direction that the user is facing and that the camera is pointing along the navigation route, or when the device’s camera is pointed to face the IMF. Kankainen, [0043], [0073], [0075], [0089], [0103], FIGS. 6B-6D, 6H. Kankainen also satisfies interpretations (1) and (2) for the additional reason that a POSITA would have found it obvious to receive and display a live video captured in the same direction as where the user is walking or navigating and pointing the device to advantageously provide the user with real-time navigation guidance, which provides for a better user experience because the user will have accurate navigation information throughout the route. A POSITA would have reasonably expected to succeed in doing so because this implementation was well known and applied only to routine functions. Waldman, [0010], [0031], [0034]-[0039], FIGS. 3-4; Geelen, [0071], [0111], [0117], FIGS. 6, 10-11; Ma, [0093]; Williams ¶ 240. Kankainen also satisfies interpretation (3) because it discloses that directional navigation information is displayed in the live video or “live camera view” “[a]s the user continues walking along the route” in a first direction down 18th St. to a “turning point located at the cross section of ... H St. and ... 18th St.” or, alternatively, down H St., the user reaches the “turning point located at the cross section of ... H St. and ... 19th St.,” and the “live camera view” shows a left arrow directing the user to “turn right at H St[.] NW” or, alternatively,

“turn left at 19th St[.] NW” in a second direction (blue) towards the IMF, as shown below. Kankainen, [0051], [0073], [0075], FIGS. 6C-6D.

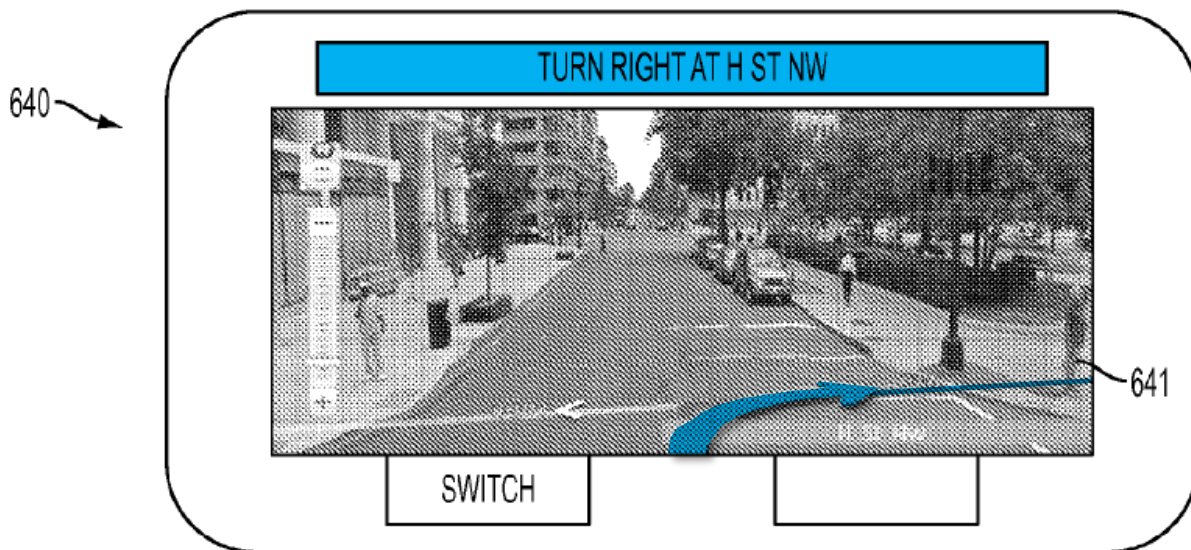


FIG. 6C

Kankainen, FIG. 6C.

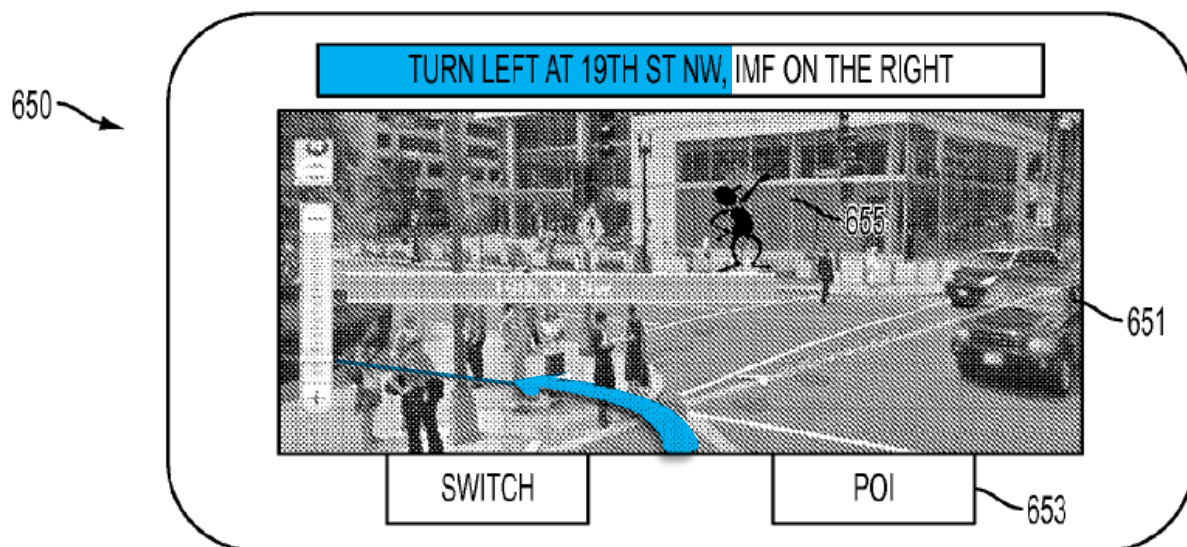


FIG. 6D

Kankainen, FIG. 6D.

2. [Claim 2] “The method of claim 1 wherein information is integrated with the video, the information for directing an attention of the user to the first object.”

241. Kankainen discloses the additional limitations of claim 2. Kankainen discloses integrating information with the live view video by superimposing “3D objects,” “representations of content and related information,” including turning points, textual instructions, and descriptors, directing the user to the IMF (first object), as explained in [1d]. *Supra* § X.C.1.e ([1d]); Kankainen, [0043], [0075], FIGS. 6A-6D, 6H. This information directs an attention of the user to the IMF by providing a visual representation of the route like the “attention output” described in the ’215 patent and discussed in Ground 1. Kankainen, [0039], [0075]; *supra* § X.A.2 (claim 2). For example, the turning point directs the user’s attention to the IMF by “direct[ing] a user to change direction” or location. Kankainen, [0075], FIG. 6D; Ex. 1001, 29:31-39.

242. Kankainen integrates the information with the live view video “utiliz[ing] the augmented reality or augmented virtuality ... to insert rich content information ... in the live image view in a real time manner.” Kankainen, [0039]. Examples include direction arrows superimposed on the video and the corresponding textual navigation “IMF on the right” (FIG. 6D) and textual overlays identifying the IMF (FIG. 6H) (each green).

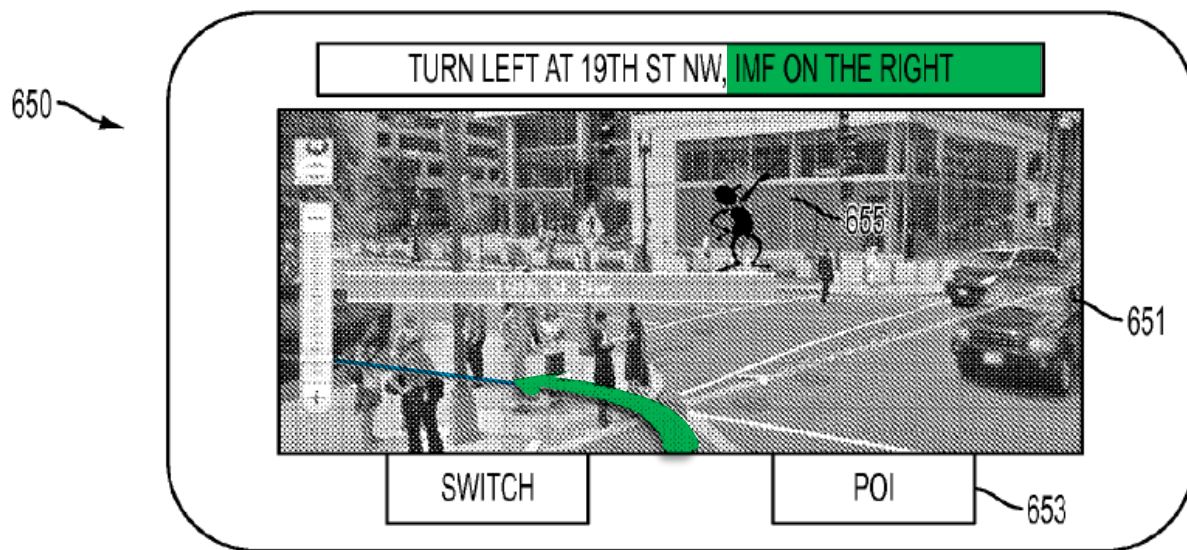


FIG. 6D

Kankainen, FIG. 6D (annotated).

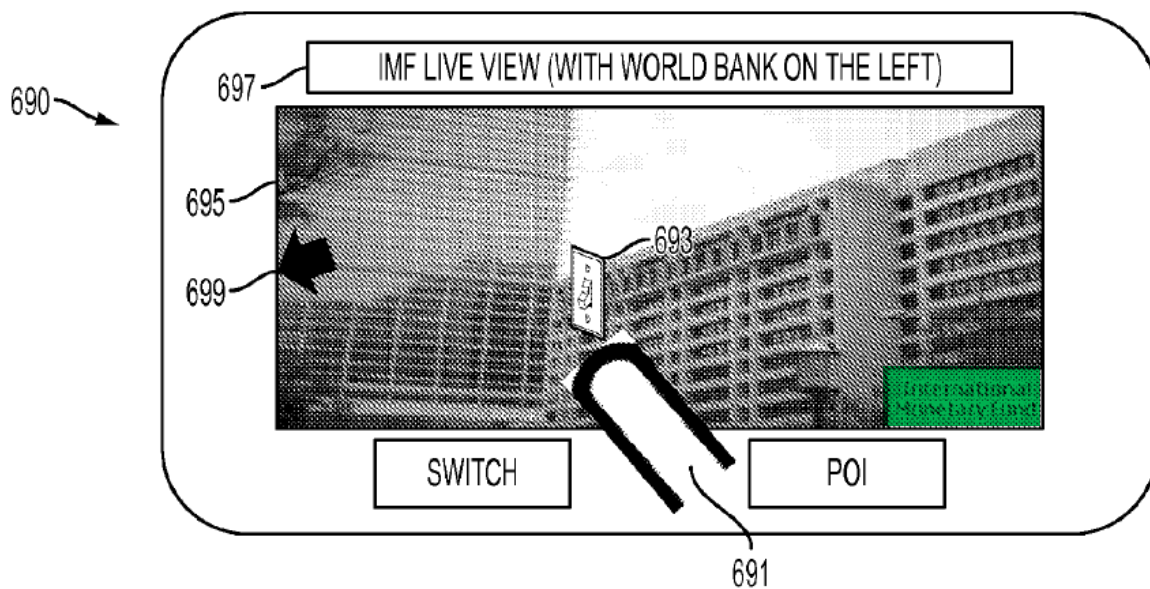


FIG. 6H

Kankainen, FIG. 6H (annotated).

3. [Claim 3] “The method of claim 1 wherein information is integrated with the video, the information for instructing the user to direct an attention to the first object.”

243. Kankainen discloses the additional limitations of claim 3. Kankainen discloses information integrated with the live view video for directing or instructing a user to direct an attention to the IMF, as explained in claim 2. *Supra* §X.C.2 (claim 2); Kankainen, [0039], [0075].

244. The integrated arrow (FIG. 6D) instructs the user to direct their attention to the IMF by providing a visual means for telling the user how to navigate to the IMF, while the “IMF on the right” (FIG. 6D) and “International Monetary Fund” label (FIG. 6H) instruct the user to direct their attention to the IMF by identifying the IMF’s location. Kankainen, [0039], [0075], [0080], FIGS. 6D, 6H. This is consistent with the ’215 patent for the reasons discussed in Ground 1. *Supra* § X.A.3 (claim 3).

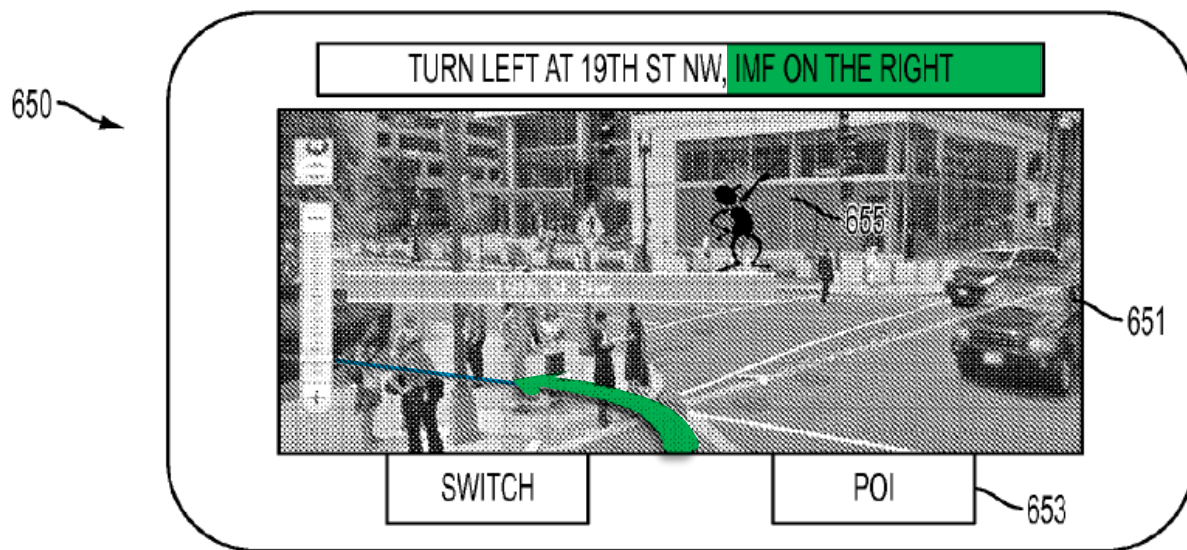


FIG. 6D

Kankainen, FIG. 6D (annotated).

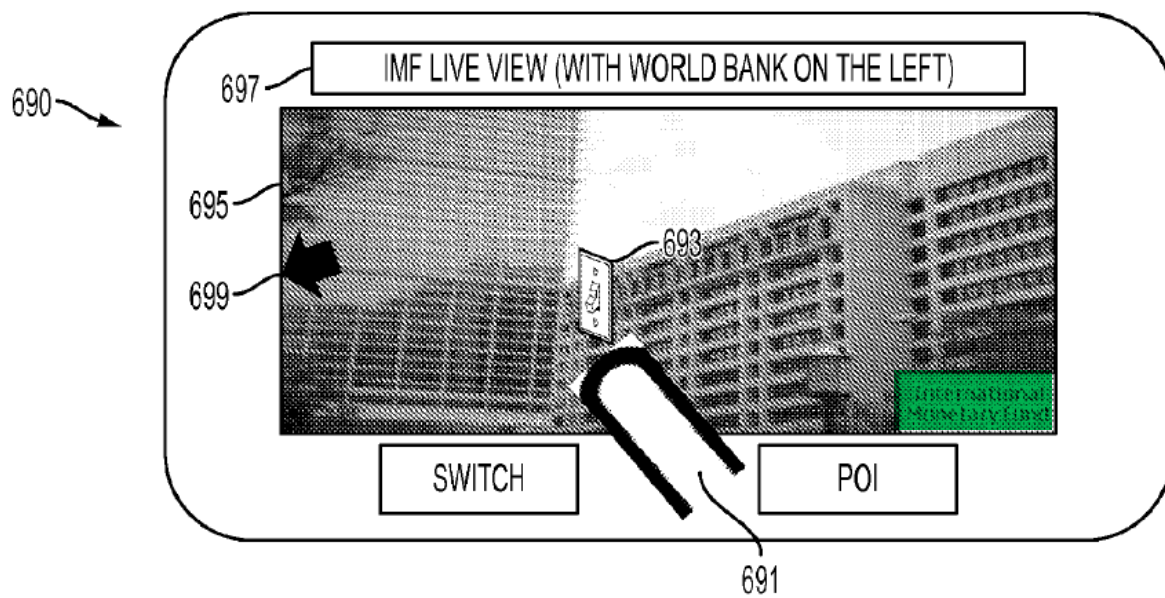


FIG. 6H

Kankainen, FIG. 6H (annotated).

4. [Claim 4] “The method of claim 1 wherein information is integrated with the video, the information indicating a location of the first object.”

245. Kankainen discloses the additional limitations of claim 4. Kankainen discloses information integrated with the live view video indicating a location of the IMF (first object), as explained in claims 2-3. *Supra* §§ X.C.2-X.C.3 (claims 2-3); Kankainen, [0039], [0075].

246. Kankainen’s indicator arrow and “IMF on the right” indicate the IMF’s location by providing navigational information to the IMF (FIG. 6D), while the “International Monetary Fund” label (FIG. 6H) (each green) identifies the location of the IMF building. Kankainen, [0039], [0075], [0080], FIGS. 6D, 6H.

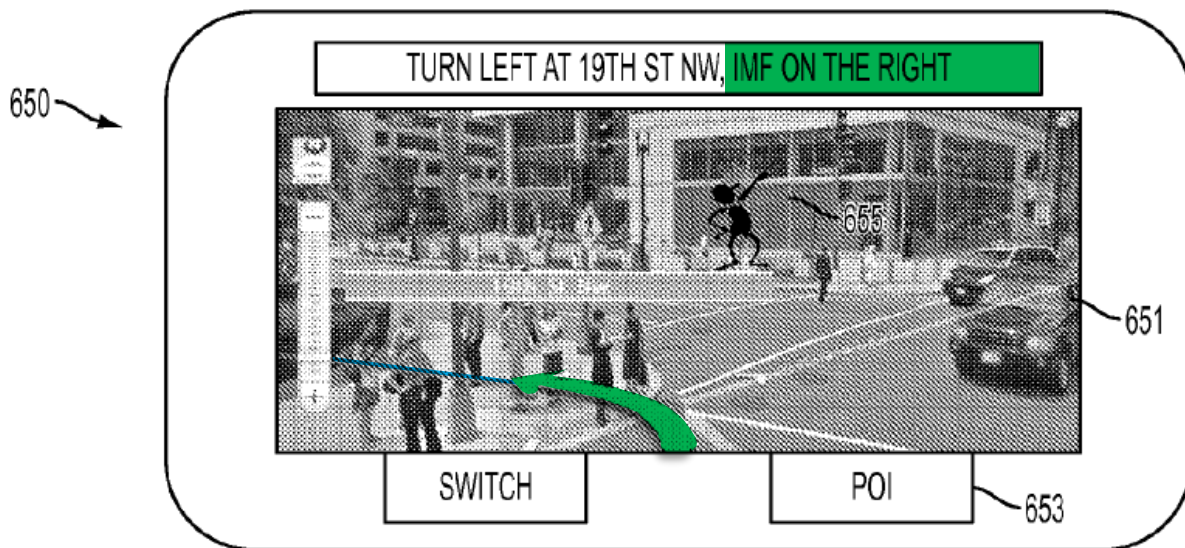


FIG. 6D

Kankainen, FIG. 6D (annotated).

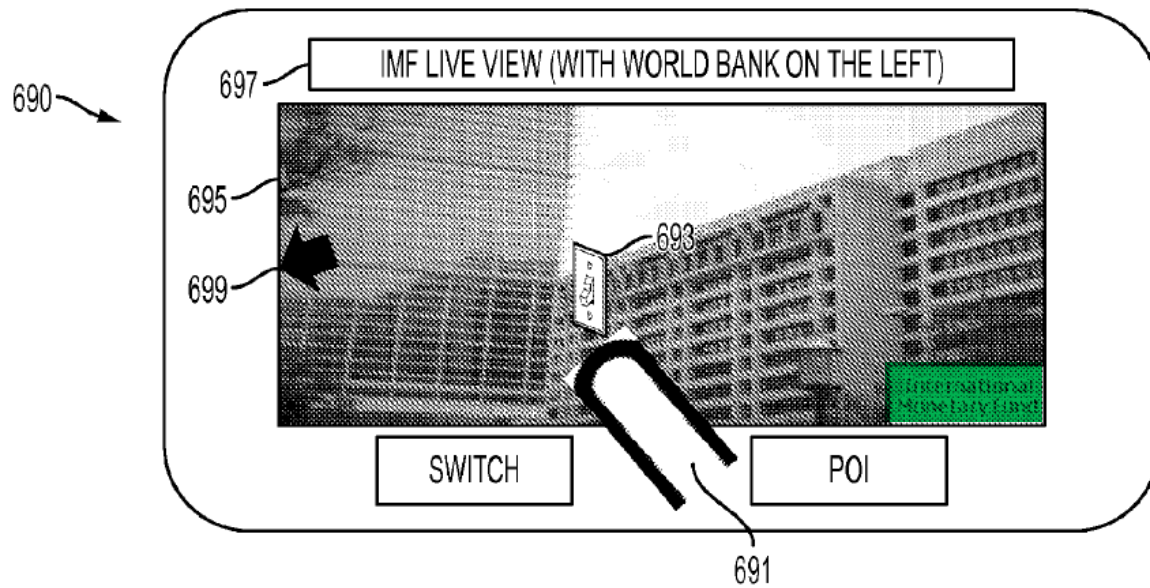


FIG. 6H

Kankainen, FIG. 6H (annotated).

5. [Claim 5] “The method of claim 1 wherein information is integrated with the video, the information including directional information indicating directions to the first object.”

247. Kankainen discloses the additional limitations of claim 5. Kankainen discloses information integrated with the live view video, including “turning point[s],” direction arrows, and the corresponding language “turn left at 19TH St[.]” and “IMF on the right” (each green), each providing directional information indicating directions to the IMF (first object), as discussed for claims 2-4. *Supra* §§ X.C.2-X.C.4 (claims 2-4); Kankainen, [0039], [0075].

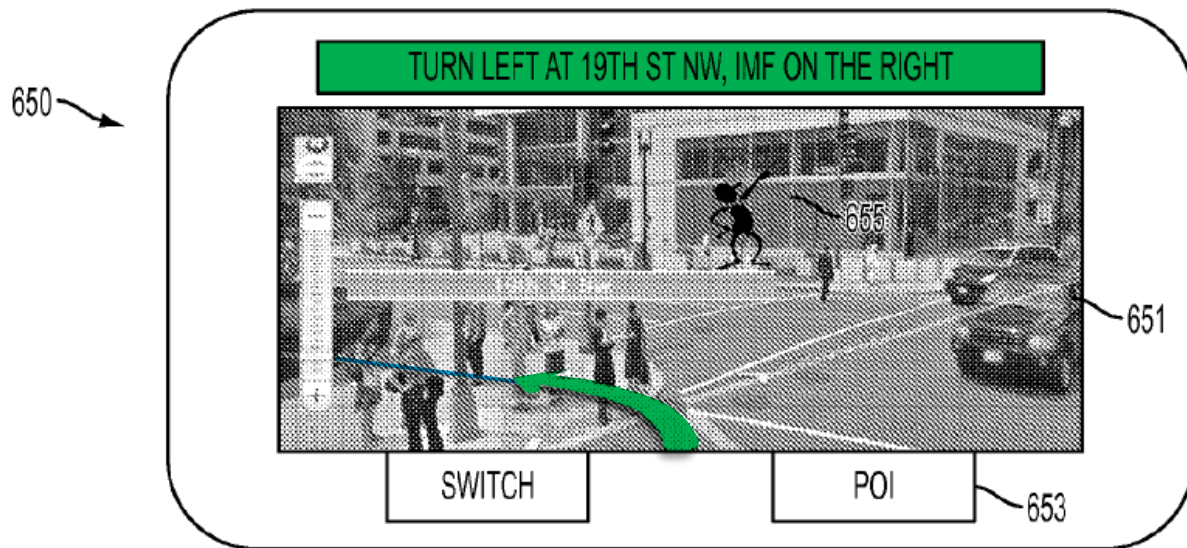


FIG. 6D

Kankainen, FIG. 6D (annotated).

6. [Claim 6] “The method of claim 1 wherein indicia is integrated with the video, the indicia including directional information indicating directions to the first object.”

248. Kankainen discloses the additional limitations of claim 6.

Kankainen’s integrated information, including “turning points,” direction arrows, and the corresponding language “turn left at 19TH St[.]” and “IMF [is] on the right” (each green), provides directional information indicating directions to the IMF (first object), as discussed for claims 2-5. *Supra* §§ X.C.2-X.C.5 (claims 2-5); Kankainen, [0039], [0075]. The information is indicia because it represents the user’s route. Kankainen, [0039], [0075]. This is consistent with the ’215 patent for the reasons discussed in Ground 1. *Supra* § X.A.6 (claim 6).

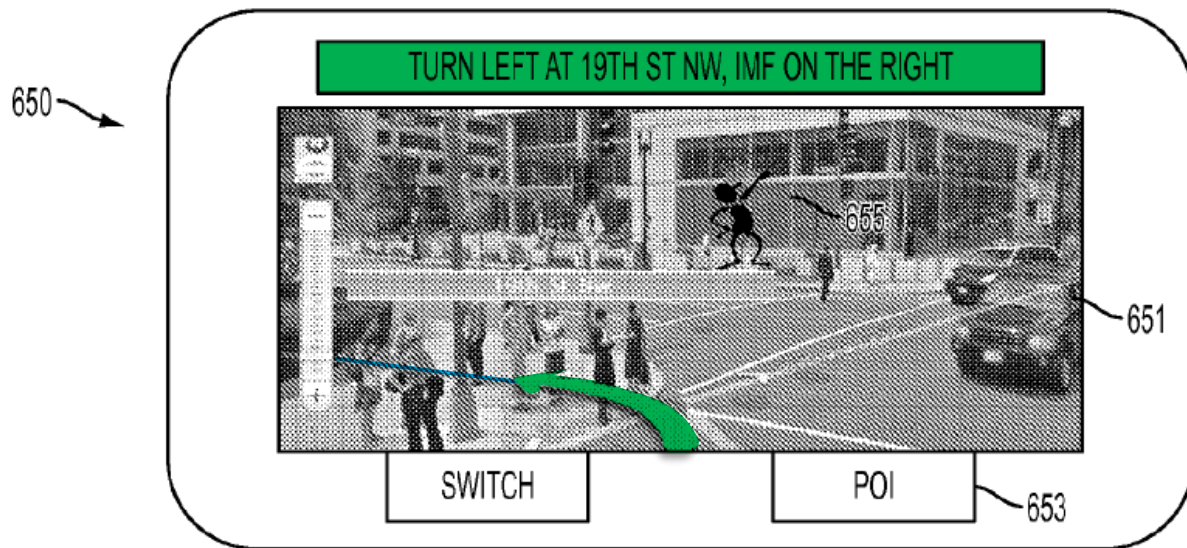


FIG. 6D

Kankainen, FIG. 6D (annotated).

7. [Claim 7] “The method of claim 1 wherein indicia is integrated with the video, the indicia indicating directions to the first object, where a location of the indicia on the display device of the portable electronic device is based on a relative position between the first object and the portable electronic device.”

249. Kankainen discloses the additional limitations of claim 7. Kankainen discloses indicia integrated with the live view video indicating directions to the IMF, as explained for claim 6. *Supra* § X.C.6 (claim 6); Kankainen, [0039], [0075], FIG. 6D.

250. Kankainen discloses that the indicia’s location (e.g., turning points) is based on the relative position between the UE and the IMF because “[a]n inherent property of an augmented reality user interface is that the displayed content

[location of the indicia] is dependent on the viewpoint” of the UE, such as updating the “turning points” and navigational route to indicate the relative position of the UE and the IMF. Kankainen, [0069], [0075], FIGS. 6B-6D, 6H.

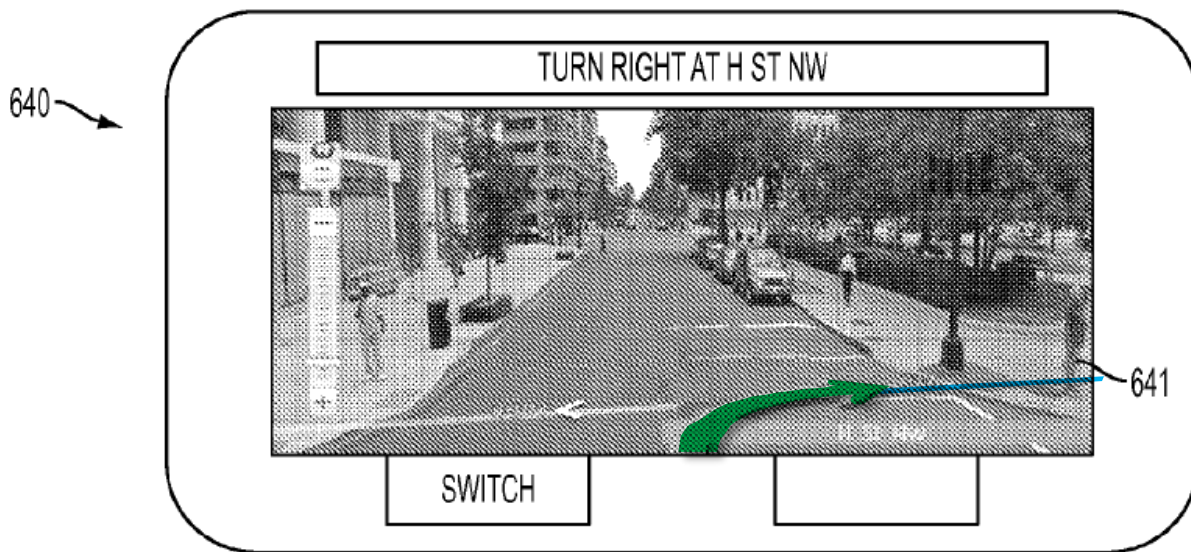


FIG. 6C

Kankainen, FIG. 6C (annotated).

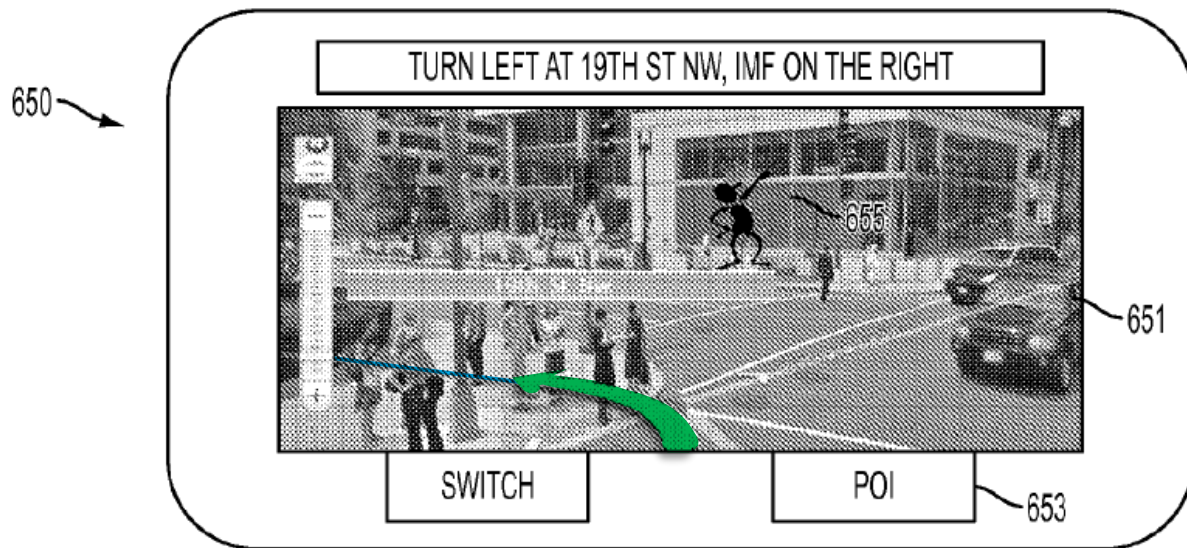


FIG. 6D

Kankainen, FIG. 6D (annotated).

8. [Claim 14] “The method of claim 1 wherein the video includes data reflecting a video capture of surroundings of the first object.”

251. Kankainen discloses the additional limitations of claim 14. Kankainen discloses that the live view video includes data, such as “turning points,” textual directions, and labels, reflecting the live video capture of surroundings of the IMF (first object), as discussed for claims 1-7. *Supra* §§ X.C.1-X.C.7 (claims 1-7); Kankainen, [0039], [0075], FIGS. 6C-6D, 6H.

252. The data reflects a video capture of the IMF’s surroundings because “the displayed content is dependent on the viewpoint” of the UE, which includes the areas surrounding the IMF. Kankainen, [0039], [0069], [0075], FIGS. 6C-6D, 6H. For example, when the IMF comes into view, as illustrated in FIG. 6H, the live

video also includes data reflecting the video capture of the IMF's surroundings, e.g., the World Bank and the IMF label (each green). Kankainen, [0080], FIG. 6H.

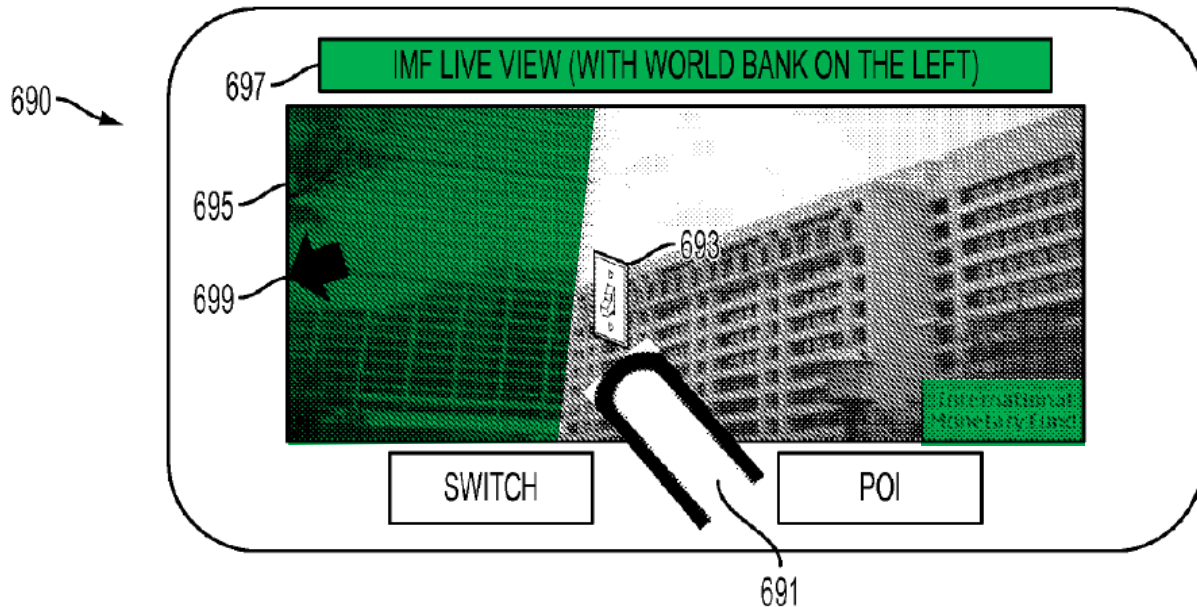


FIG. 6H

Kankainen, FIG. 6H (annotated).

9. [Claim 15] “The method of claim 1 wherein the first object includes a location.”

253. Kankainen discloses the additional limitations of claim 15. As explained in [1c], Kankainen discloses that the first object, the IMF building, has a location “located at 700 19th St. NW[,] Washington D.C.” *Supra* § X.C.1.d ([1c]); Kankainen, [0034] (the IMF corresponds to “location data (e.g., an address, GPS coordinates, etc.)”), [0073]. To navigate to the IMF, Kankainen’s system “retrieves location data (e.g., an address, GPS coordinates, etc.) of the IMF,” which is the IMF’s location, and “then maps a route from the current location (e.g., the METRO

Station) to the designated POI, and presents the route on a digital map to the user.”

Kankainen, [0020], [0034], [0074].

- 10. [Claim 16] “The method of claim 1 and further comprising: detecting a change in the movement of the portable electronic device; in response to detecting the change in the movement of the portable device, updating the presentation of the video by the display device of the portable electronic device.”**

254. Kankainen discloses the additional limitations of claim 16. Kankainen discloses detecting a change in movement of the UE as “the user continues walking along the route,” for example, “[w]hen the user is walking on ... 19th St.” or “[w]hen the user walks close to the IMF” on 19th St. Kankainen, [0075], [0077], [0079], [0080], FIGS. 6D-6E, 6H. The movement change is detected using, for example, GPS tracking, as explained in claim 1. *Supra* § X.C.1 (claim 1).

255. Kankainen updates the presentation of the live video view based on the detected change by integrating new navigation information with the video. For example, Kankainen teaches including labels, “turning points,” and corresponding directional language in response to the detected change in movement from the first direction to the second direction and as the user draws closer to the IMF, as shown in FIGS. 6C-6D and 6H (exemplary annotations **green**) and further discussed in claims 1-7 and 14. Kankainen, [0075], FIGS. 6B-6D, 6H; *supra* §§ X.C.1-X.C.7 (claims 1-7), X.C.8 (claim 14).

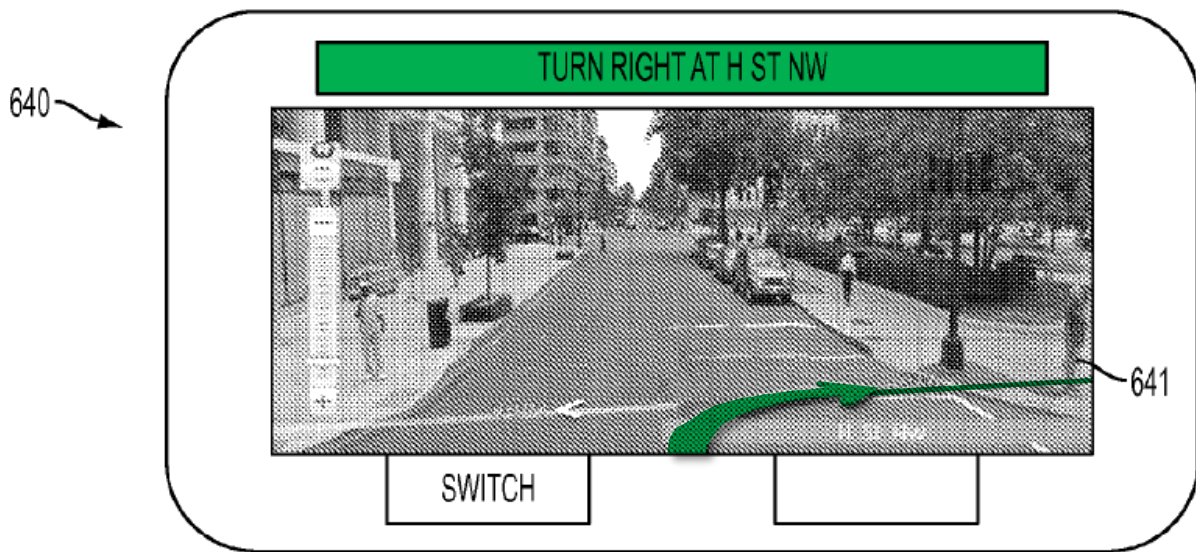


FIG. 6C

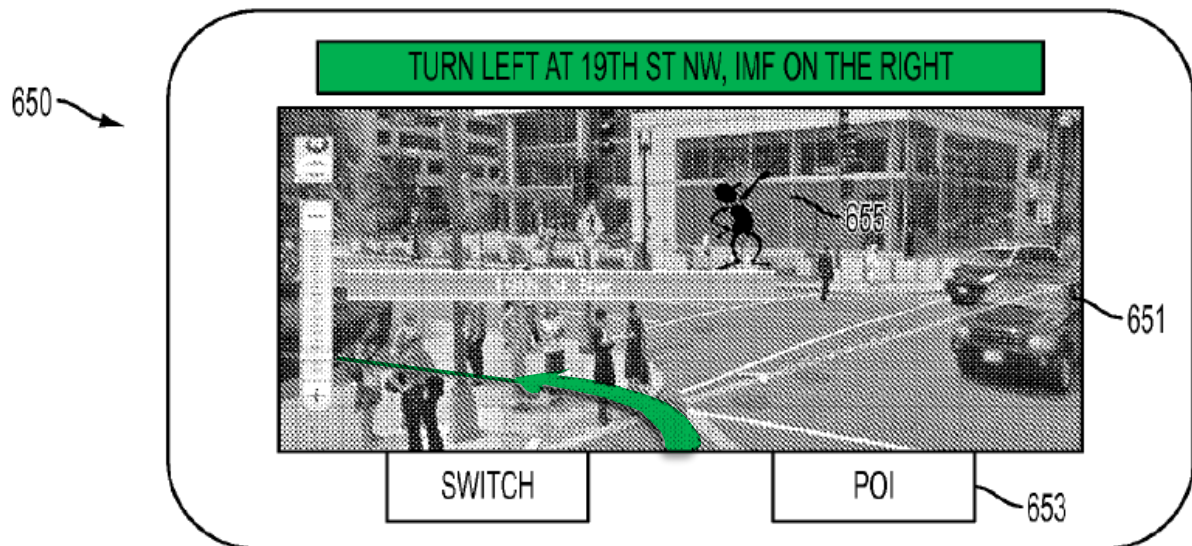


FIG. 6D

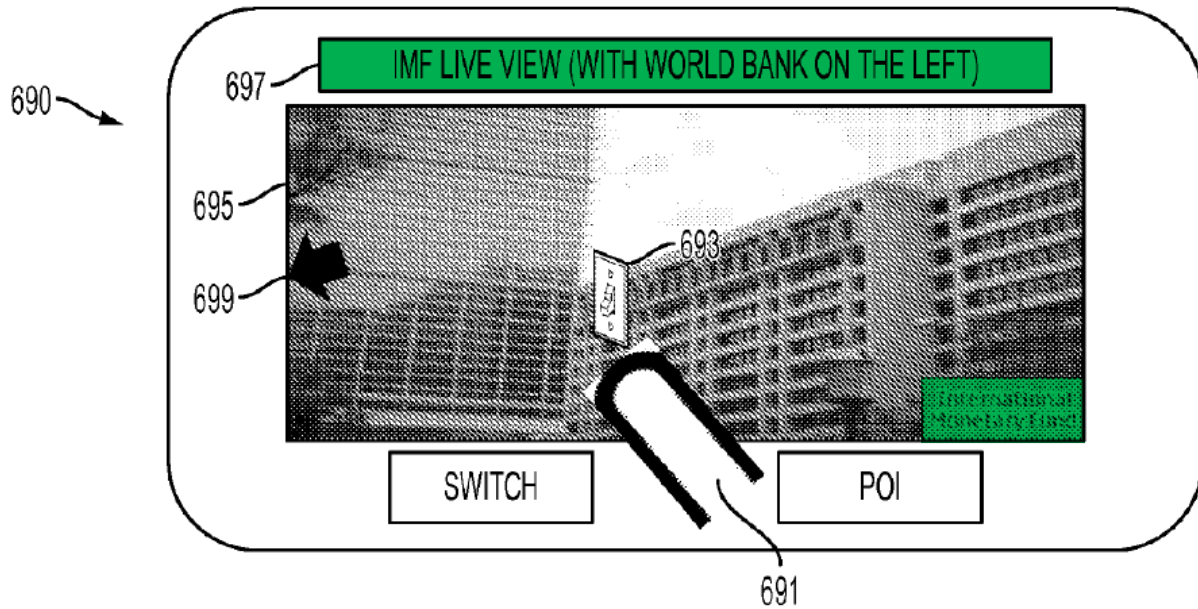


FIG. 6H

Kankainen, FIGS. 6C-6D, 6H (annotated).

11. [Claim 17] “The method of claim 1 wherein the video is conditionally presented by the display device of the portable electronic device, based on a detected position of the portable electronic device.”

256. Kankainen discloses the additional limitations of claim 17. Kankainen discloses or renders obvious receiving and presenting “live view” video captured by a video camera on the UE’s display screen “[a]s the user continues walking along the route,” as discussed in claim 1. *Supra* § X.C.1 (claim 1); Kankainen, [0019], [0074], [0075], [0082].

257. Kankainen’s live view video is conditionally presented based on the UE’s detected position because the video and visual augmentations, such as “direction line 623 with an arrow” in FIG. 6B, the “turning point[.]” arrows in

FIGS. 6C-6D, and the “International Monetary Fund” label in FIG. 6H, are presented based on the device’s location along the route and depend on the device’s facing direction. Kankainen, [0067], [0069], [0075].

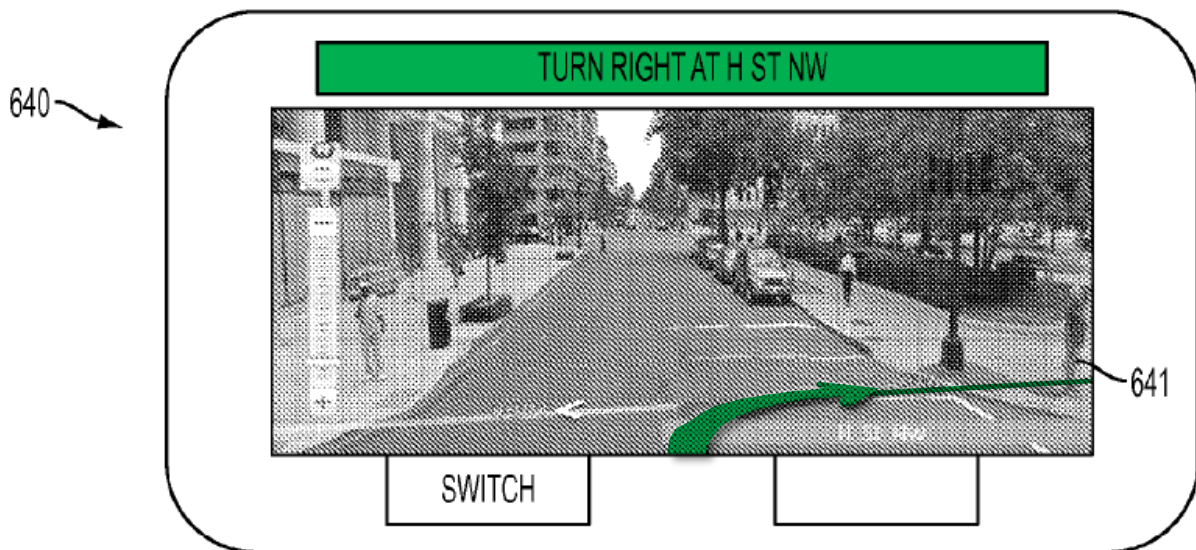


FIG. 6C

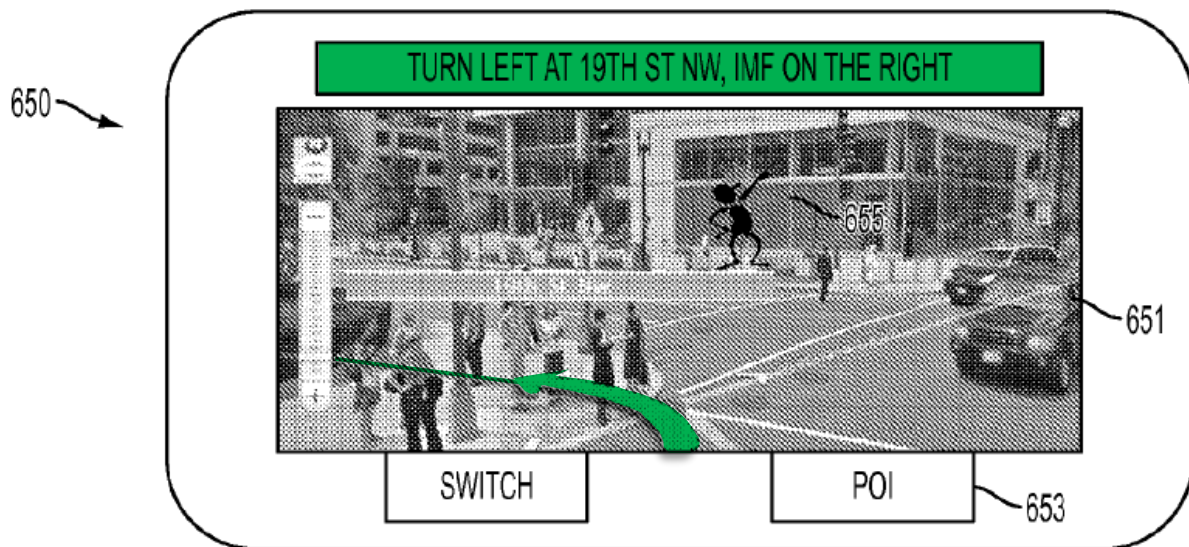


FIG. 6D

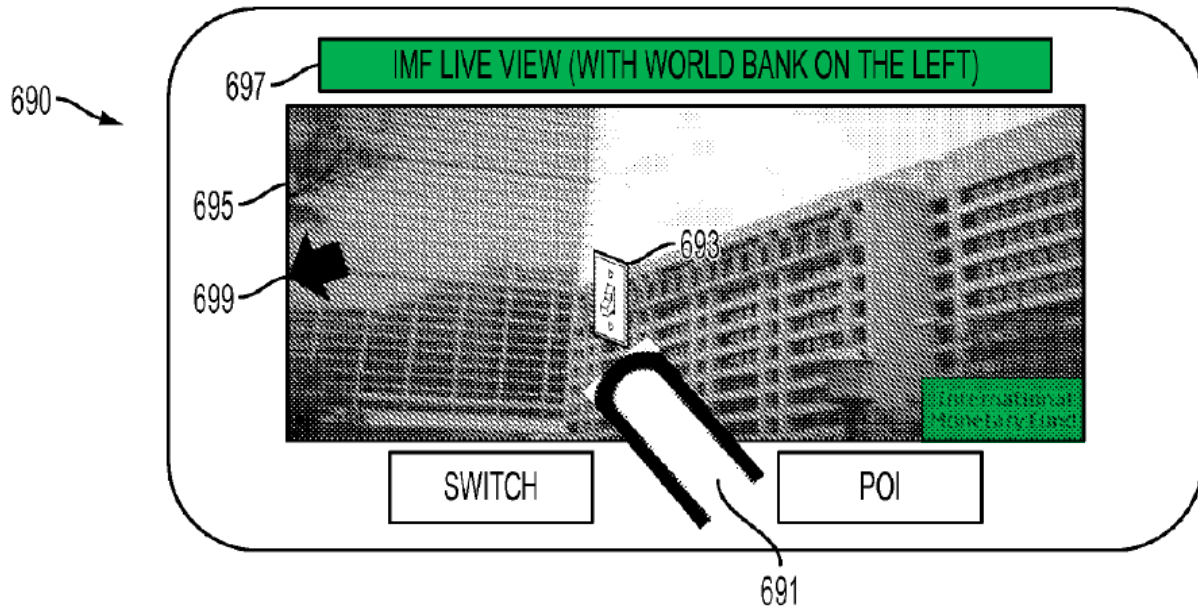


FIG. 6H

Kankainen, FIGS. 6C-6D, 6H (annotated).

12. [Claim 20] “The method of claim 1 wherein the user is directed in the second direction towards the first object which is not initially presented in the video, so that the user is directed to walk in the second direction for directing an attention of the user to the first object.”

258. Kankainen discloses the additional limitations of claim 20.

259. As explained in claims 1-7, Kankainen discloses directing the user in the second direction, either along H St. or down 19th St., towards the IMF (first object), using information/indicia augmented with the live video. *Supra* §§ X.C.1, X.C.7 (claims 1, 7); Kankainen, [0043], [0075], FIGS. 6B-6D, 6H.

260. The IMF (first object) is not initially presented in the video, which shows “a live view of the [UE’s] current[] location” on 18th St. or H St., and the

IMF is not within the viewpoint of the UE's video camera, and was thus not originally displayed in the live view video. Kankainen, [0074]-[0075], FIGS. 6A, 6C.

261. The augmented information directs the user to “walk[] along the route,” and identifies the IMF's location in the second direction, thereby directing the user's attention to the IMF, as discussed for claims 1-3. Kankainen, [0043], [0075]; *supra* §§ X.C.1-X.C.3 (claims 1-3).

13. [Claim 21]

a. [21Preamble] “The method of claim 1 and further comprising:”

262. Kankainen discloses the additional method steps of claim 21.

b. [21a] “detecting additional movement of the portable electronic device in the second direction, that results from the user walking with the portable electronic device in the second direction;”

263. Kankainen discloses the additional limitations of element [21a].

Kankainen discloses detecting additional movement of the UE in the second direction, such as down 19th St., as “the user continues walking along the route,” “[w]hen the user is walking on ... 19th St,” and “[w]hen the user walks close to the IMF” on 19th St. with the UE, as discussed in claims 1 and 16. Kankainen, [0075], [0077], [0079], [0080]; *supra* §§ X.C.1, X.C.10 (claims 1, 16).

- c. [21b] “receiving additional video data, that includes the first object, captured by the video capture device during the additional movement of the portable electronic device in the second direction;”

264. Kankainen discloses the additional limitations of element [21b].

Kankainen discloses receiving additional video data captured by the “video camera” that includes the IMF “[w]hen the user walks close to the IMF” after turning left on 19th St. in the second direction. Kankainen, [0051], [0075], [0079], [0080]. The additional captured video shows “the IMF on the right hand side [(green)] and the World Bank [on] the left hand side in the live image [video] view,” which includes the IMF (first object). Kankainen, [0075], [0079], [0080], FIG. 6H.

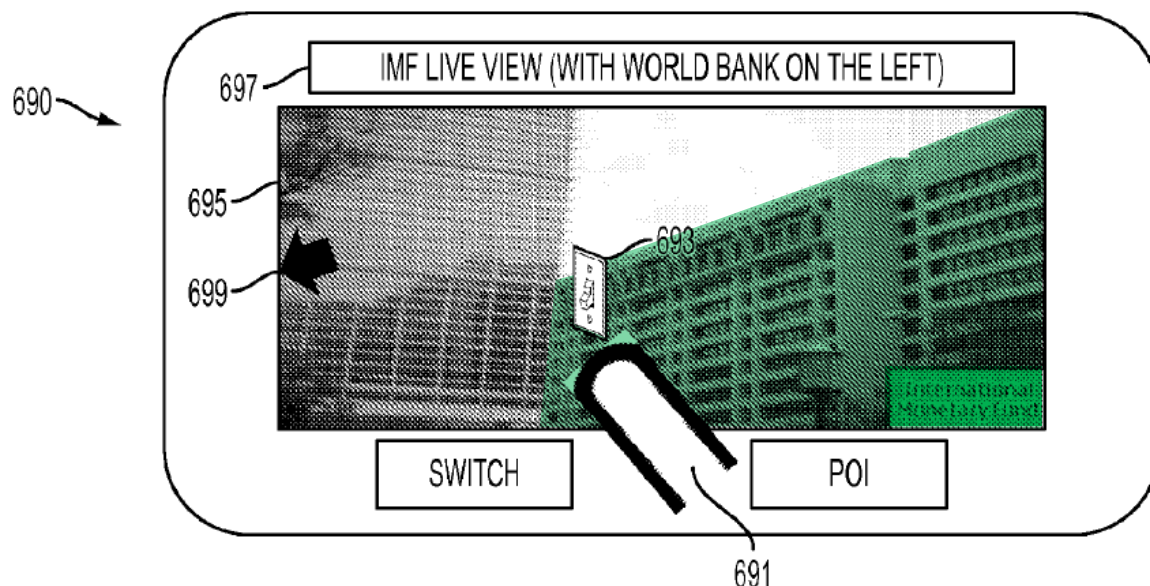


FIG. 6H

Kankainen, FIG. 6H (annotated).

- d. [21c] “and utilizing the additional video data, presenting additional video by the display device of the portable electronic device that is viewable to the user for directing an attention of the user in connection with the first object that is presented in the additional video.”

265. Kankainen discloses the additional limitations of element [21c].

Kankainen presents additional video of the IMF utilizing the additional video data, as discussed in [21b]. Kankainen, [0079], [0080], FIG. 6H; *supra* § X.C.13.c ([21b]). The live image video is presented on the UE’s screen, which is viewable to the user and includes (presents) the overlaid text “International Monetary Fund” (green) that directs the user’s attention to the IMF by identifying the IMF’s location. Kankainen, [0079], [0080], FIG. 6H.

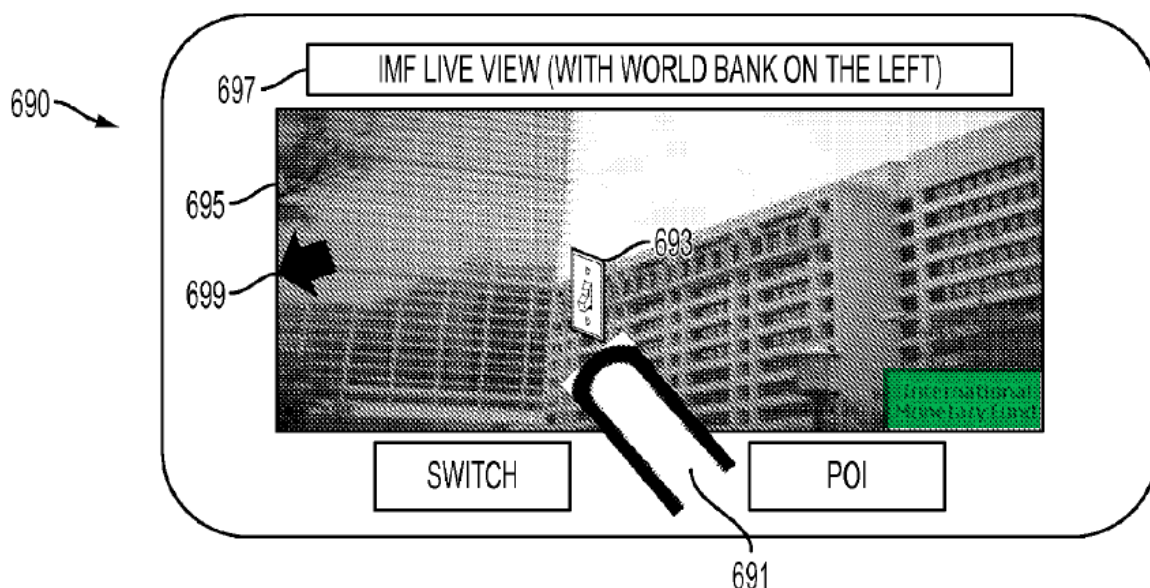


FIG. 6H

Kankainen, FIG. 6H (annotated).

14. [Claim 22] “The method of claim 1 wherein information is integrated with the video, the information being received via a data store including location information for objects with fixed locations.”

266. Kankainen discloses the additional limitations of claim 22. Kankainen discloses integrating information with the live image video, including POIs (such as the World Bank and IMF), as discussed in claims 1, 2, 14, 16, 17, and 21.

Supra §§ X.C.1, X.C.2, X.C.8, X.C.10, X.C.11, X.C.13 (claims 1, 2, 14, 16, 17, 21); Kankainen, [0039], [0075], FIGS. 6C-6D, 6H.

267. The integrated information is received from a content mapping platform—a data store—that “stores mapping information in the map database 109a” and “includes all or a portion [of] the information in the map database 109a and the content catalog 109b,” including location information, such as “GPS coordinates,” “geo-tagged data,” and “[POIs] data,” for objects with fixed locations such as “landmarks” (e.g., IMF, World Bank, Eiffel Tower) and “turning point[s].” Kankainen, [0021], [0042], [0043], [0064], [0073], [0075].

15. Independent Claim 18

268. Kankainen discloses or renders obvious claim 18 for the reasons discussed for claim 1. *Supra* § X.C.1 (claim 1).

a. [18Preamble] “A portable electronic device, comprising:”

269. To the extent the preamble is limiting, Kankainen discloses “[a] portable electronic device,” such as user equipment (UE) 101, which may be a “mobile handset.” Kankainen, [0042], [0047].

b. [18a] “a display device;”

270. Kankainen discloses element [18a]. Kankainen discloses that UE 101 includes a display device, such as a “display” or “screen,” to present the augmented live image video. Kankainen, [0034], [0065], [0075], FIGS. 6A-6H, 7.

c. [18b] “an input device;”

271. Kankainen discloses element [18b]. Kankainen discloses that UE 101 includes a “touch-screen interface, microphone, camera, a scroll-and-click interface, a button interface, etc.,” for receiving “[u]ser inputs.” Kankainen, [0065].

d. [18c] “at least one non-transitory memory storing instructions;”

272. Kankainen discloses element [18c]. Kankainen further discloses that computer system 700, which performs the disclosed methods and embodies UE 101, includes non-transitory memory 704 for “stor[ing] information[,] including processor instructions for correlating and navigating between a live camera image” and “processor instructions” that “perform one or more of the method steps described.” Kankainen, [0088], [0096]. Memory 704, like the memory of the ’215 patent, may be configured as dynamic RAM. Kankainen, [0088]; Ex. 1001, 4:21-

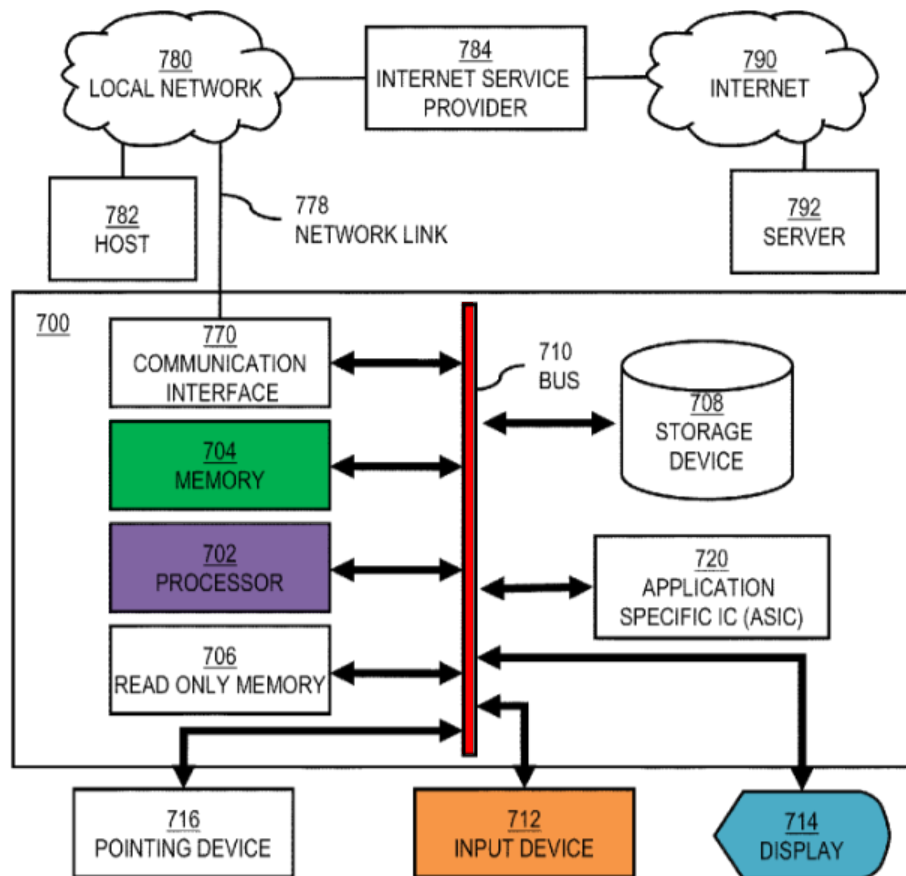
26.³ Dynamic RAM 704 also reads the instructions from “storage device” 708, another “[n]on-transitory medi[um].” Kankainen, [0088], [0092], [0096].

- e. **[18d] “and one or more processors in communication with the display device, the input device, and the at least one non-transitory memory,”**

273. Kankainen discloses element [18d]. Kankainen discloses that “the method steps described” in Kankainen “are performed ... in response to processor 702 executing ... one or more processor instructions contained in memory 704,” which are also contained in storage device 708. Kankainen, [0096]. A POSITA would have understood that the methods include the processes discussed for elements [1a]-[1d]. *Supra* §§ X.C.1.b-X.C.1.e ([1a]-[1d]). Processor 702 (purple) is coupled to and communicates with the display device 714 (teal) to display the augmented live view video, input device 712 (orange) to receive user inputs, and non-transitory memory 704 or 708 (green) to read instructions for execution via bus 710 (red), as shown in FIG. 7. Kankainen, [0065], [0075], [0088]-[0089], [0096], FIG. 7.

³ On my review, the term “non-transitory” does not appear to be recited in the ’215 patent’s specification. *See generally* Ex. 1001.

FIG. 7



Kankainen, FIG. 7 (annotated).

- f. [18e] “wherein the one or more processors execute the instructions to cause the portable electronic device to:”

274. Kankainen discloses element [18e]. Kankainen discloses that processor 702 “[e]xecut[es] ... the sequences of instructions contained in memory 704 ... to perform one or more of the method steps described” in Kankainen, recited in elements [18f]-[18i]. Kankainen, [0096].

- g. [18f] “detect a movement of the portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”**

275. Kankainen discloses element [18f] for the reasons discussed for [1a].

Supra § X.C.1.b.

- h. [18g] “receive video data captured in a first direction by a video capture device during the movement,”**

276. Kankainen discloses or renders obvious element [18g] for the reasons discussed for [1b]. *Supra* § X.C.1.c.

- i. [18h] “where a first object is in a second direction;”**

277. Kankainen discloses element [18h] for the reasons discussed for [1c].

Supra § X.C.1.d.

- j. [18i] “and present a video by the display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”**

278. Kankainen discloses or renders obvious element [18i] for the reasons discussed for [1d]. *Supra* § X.C.1.e.

16. Independent Claim 19

279. Kankainen discloses or renders obvious claim 19 for the reasons discussed for claims 1 and 18. *Supra* §§ X.C.1, X.C.15 (claims 1, 18).

- a. **[19Preamble] “A non-transitory computer-readable media storing computer instructions that, when executed by one or more processors of a portable electronic device, cause the portable electronic device to:”**

280. To the extent the preamble is limiting, Kankainen discloses [19Preamble].

281. Kankainen discloses a computer-readable medium, such as memory 704 and storage device 708, storing “computer instructions, software[,] and program code” that, when executed by computer system processor 702, cause Kankainen’s UE, which is a portable electronic device, “to perform one or more of the method steps described” in Kankainen, recited in elements [19a]-[19d], as explained in claim 18. *Supra* § X.C.15 (claim 18); Kankainen, [0096].

- b. **[19a] “detect movement of the portable electronic device in a first direction, that results from a user walking with the portable electronic device in the first direction;”**

282. Kankainen discloses element [19a] for the reasons discussed for [1a].
Supra § X.C.1.b.

- c. **[19b] “receive video data captured in a first direction by a video capture device during the movement,”**

283. Kankainen discloses or renders obvious element [19b] for the reasons discussed for [1b]. *Supra* § X.C.1.c.

d. [19c] “where a first object is in a second direction;”

284. Kankainen discloses element [19c] for the reasons discussed for [1c].

Supra § X.C.1.d.

e. [19d] “and present a video by the display device of the portable electronic device that is viewable to the user for directing the user in a second direction towards the first object.”

285. Kankainen discloses or renders obvious element [19d] for the reasons discussed for [1d]. *Supra* § X.C.1.e.

D. Ground 4: Kankainen and Geelen Render Obvious Claims 8-11

1. [Claim 8] “The method of claim 1 wherein first indicia and second indicia are integrated with the video, the first indicia indicating directions to the first object, the second indicia indicating a distance to the first object.”

286. Kankainen in combination with Geelen renders obvious claim 8.

287. Kankainen discloses multiple indicia, including a “direction line,” “direction icon,” “turning point[,]” navigation arrow, “direction bar,” and POI icon, integrated with the live view video for indicating directions to the IMF (first object), as explained in claims 1, 6, and 7. *Supra* §§ X.C.1, X.C.6, X.C.7 (claims 1, 6, 7); Kankainen, [0075], FIGS. 6B-6D, 6H. Kankainen also suggests indicating a distance between the user’s location at Farragut West Metro Station and the IMF (first object) by showing the number of blocks on the navigation route (red), which correspond to the distance between the user’s device and the first object, but does

not expressly disclose second indicia indicating a distance to the IMF in the live video. Kankainen, [0073], [0075], FIG. 5.

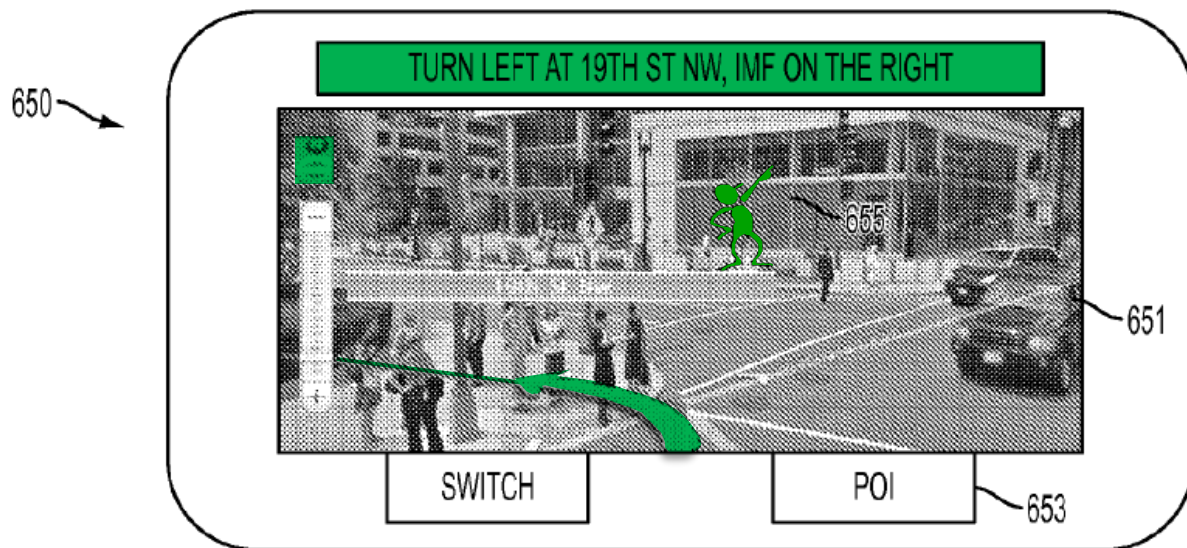


FIG. 6D

Kankainen, FIG. 6D (annotated).

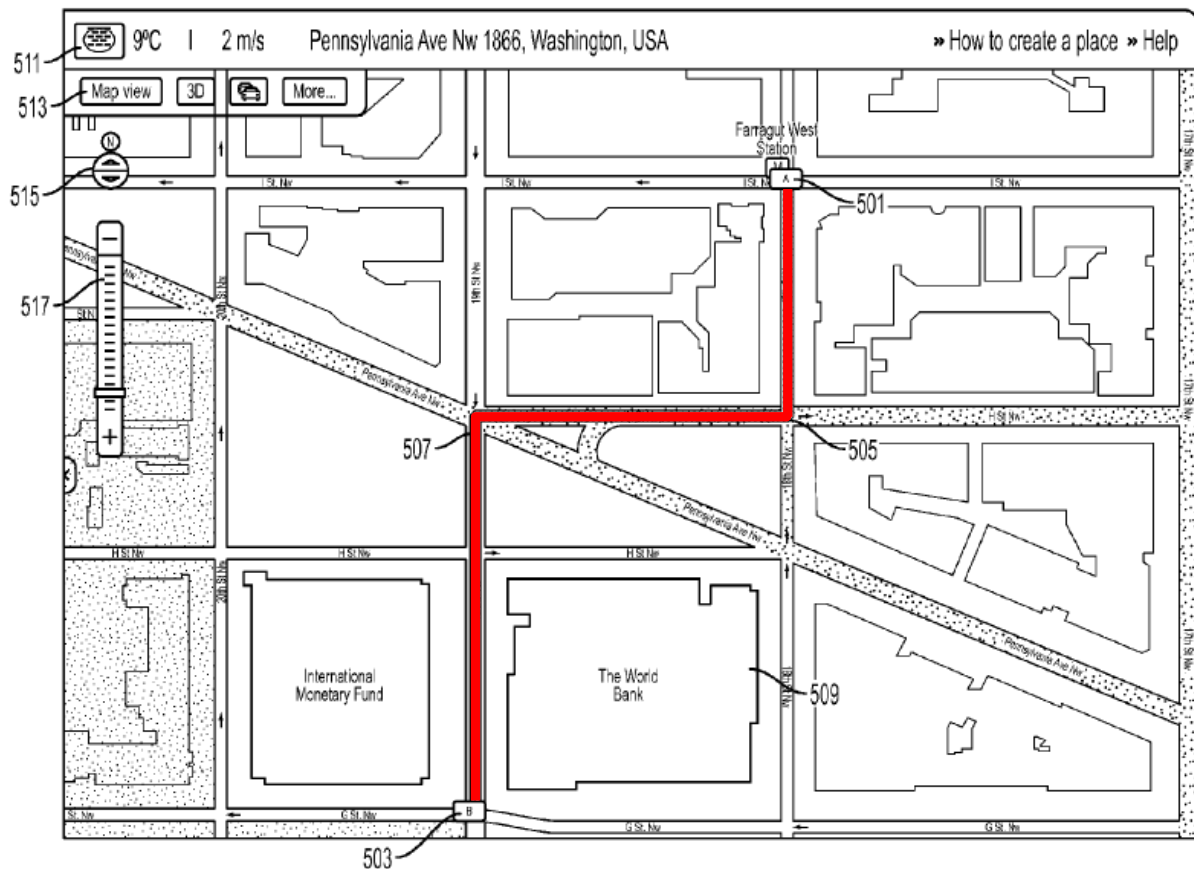
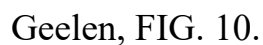


FIG. 5

Kankainen, FIG. 5 (annotated).

288. Geelen discloses providing navigation directions using a “real time” feed “for walkers” on a portable electronic device. Geelen, [0002], [0061], [0071]. Like Kankainen, Geelen “superimpose[s] in [a] video feed” “navigation directions over the camera image” where all the navigation directions “match with the actual position of the corresponding item in the camera image.” Geelen, [0017], [0111]. The superimposed navigation directions include first indicia (pink) indicating a direction to the destination, such as “an arrow indicating a right turn,” and second

Fig 10



a. Motivation to Combine

156

object (the IMF). Such a modification would have informed the user of their proximity to the destination and would have been useful for trip planning, e.g., deciding when to leave to ensure timely arrival and whether their arrival time is changing based on the distance remaining, determining whether additional transportation modes are needed (e.g., a vehicle for part of the way), or informing/alerting other persons about expected departure/arrival times. Furthermore, distance-to-arrival indicia were established in the art and known to provide at least the benefit described above. *See* Ex. 1010, 4:59-5:1 (displaying indicia indicating a destination's distance "from the mobile device" "over real-time ... images captured by the camera of the mobile device"); Ex. 1011, [0101]-[0102] (superimposing a navigational distance onto an image captured by a "portable terminal"); Ex. 1012, [0031], [0084] (overlaying "guidance information" representing the distance between POIs on a captured image).

b. Expectation of Success

291. A POSITA would have had a reasonable expectation of success in integrating Geelen's indicia indicating the distance to the POI into Kankainen's augmented live view because it would have required using Kankainen's existing components (augmented mapping application and location/movement identification) to perform a basic, well-known, and conventional function (superimposing images on a live camera video) to yield a predictable result

(illustrating destination proximity). Integrating indicia indicating the distance to the destination, such as the IMF, would have been a straightforward application of Kankainen's already described visual augmentation methods, as evidenced by the prior art. Geelen, [0075]; Kankainen, [0034], [0039], [0043]; Ex. 1010, Tseng, 13:20-31 (describing an augmented reality application for causing "annotations to be placed on the display screen 203," including "distance to indicate how far away particular businesses or locations are located"); Ex. 1013, Ma, [0050], [0061], [0079] (describing overlaid video navigation indicia, wherein the navigation device's GPS and "program" are used to simultaneously track "one or more objects" so that "their locational data may be shown on the view screen as a plurality of arrows 112, labels 113, distances 114 and marks 115").

2. [Claim 9] "The method of claim 8 wherein the first indicia and the second indicia are updated based on the movement of the device."

292. Kankainen in combination with Geelen renders obvious claim 9.

293. Kankainen discloses that the augmented live view "content"—integrated indicia—is updated "[a]s the user continues walking along the route." Kankainen, [0074], [0075]. The device moves "[a]s the user continues walking along the route," and Kankainen's indicia (green) shown on live video change to reflect the new viewpoint based on the device's movement, as shown in the

different images and superimposed indicia in FIGS. 6B-6D and 6H. Kankainen, [0075].

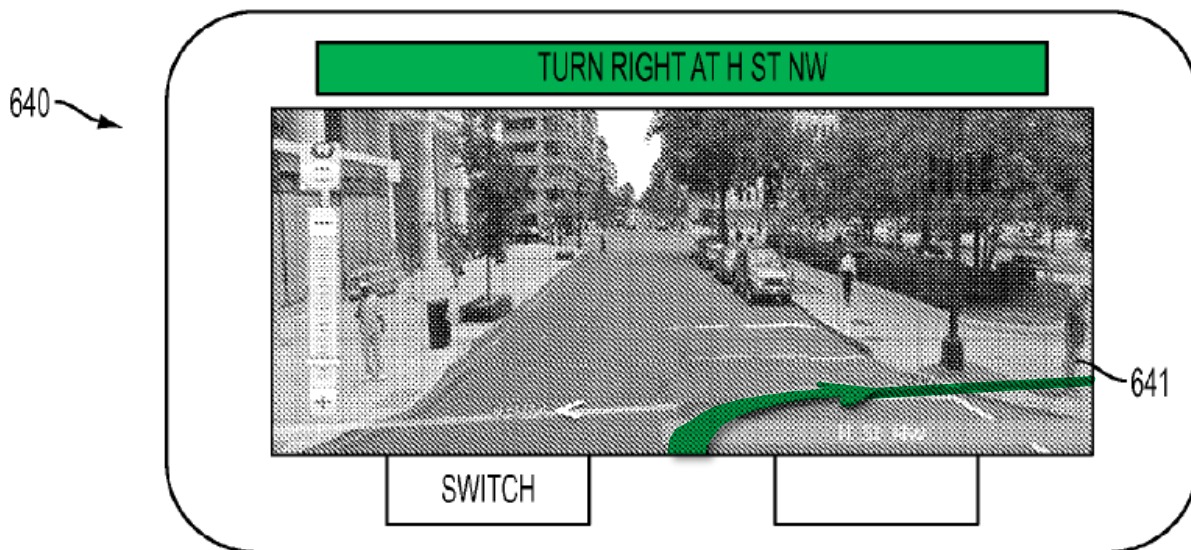


FIG. 6C

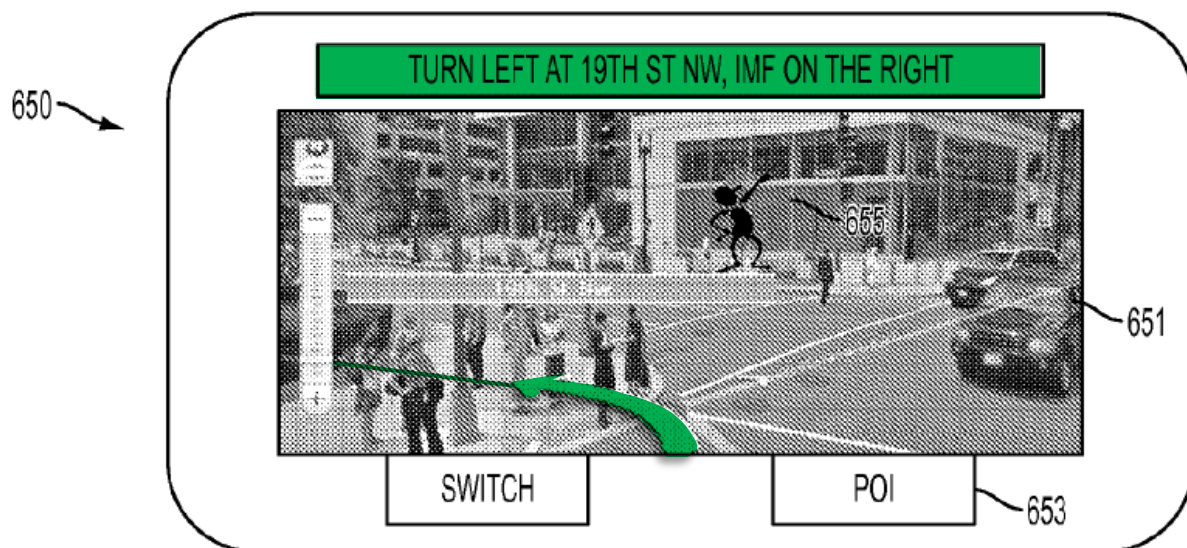


FIG. 6D

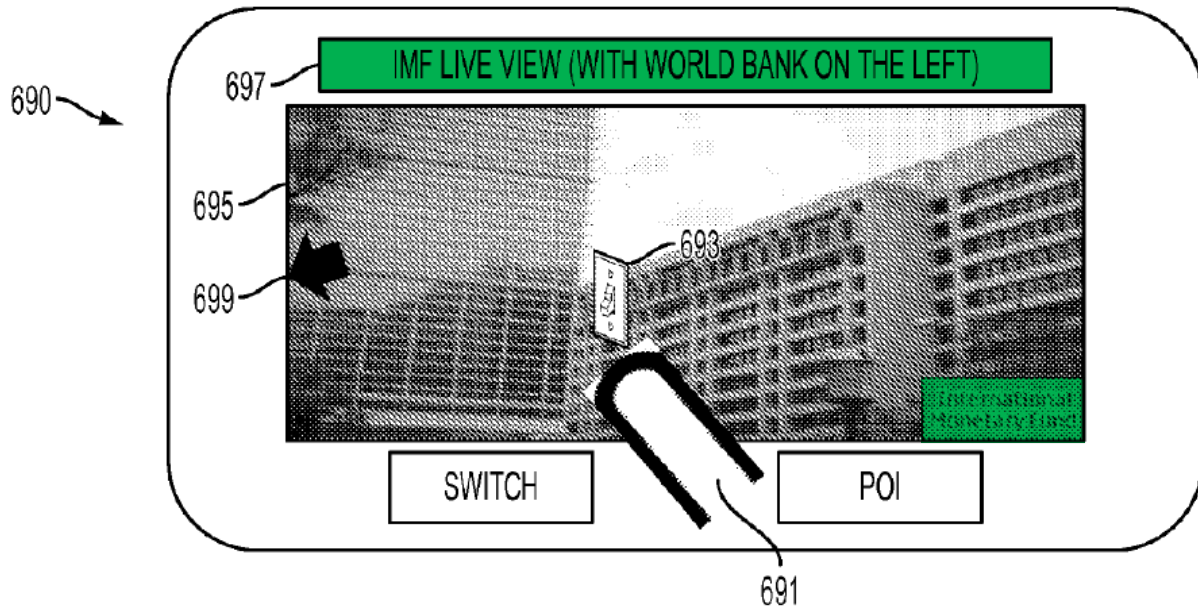


FIG. 6H

Kankainen, FIGS. 6C-6D, 6H (annotated).

294. A POSITA would have found it obvious to update the second indicia indicating the distance to the IMF (first object) based on the UE's movement, for the reasons explained in claim 8, such as to provide the user with real-time information about the remaining travel distance for planning purposes. Geelen, [0096].

3. [Claim 10] "The method of claim 8 wherein the first indicia includes a direction indicator."

295. Kankainen in combination with Geelen renders obvious claim 10.

296. As explained in claims 1 and 8, the first indicia includes an arrow at a "turning point[]" that indicates a direction that the user should turn along the navigation route. *Supra* §§ X.C.1, X.D.1 (claims 1, 8); Kankainen, [0075].

4. [Claim 11] “The method of claim 8 wherein the first indicia includes a label.”

297. Kankainen in combination with Geelen renders obvious claim 11.

298. Kankainen discloses the integrated first indicia (direction bar, superimposed route indicator, or direction arrow/turning points) including a label because they are superimposed onto the live view and describe how the user should proceed along the route, as explained in claims 1, 8, and 10. *Supra* §§ X.C.1, X.D.1, X.D.3 (claims 1, 8, 10); Kankainen, [0075] .

E. Ground 5: Kankainen and Ohnishi Render Obvious Claims 12 and 13

1. [Claim 12] “The method of claim 1 wherein tactile feedback is output simultaneously with the presentation [of] the video, the tactile feedback being output based on a location of the first object.”

299. Kankainen in combination with Ohnishi renders obvious claim 12.

300. Kankainen further discloses that the user interface can provide “vibrations,” which are tactile feedback, as part of the “[c]ontent and mapping information,” which includes the augmented video based on the first object’s location, as explained above for claims 1-3, 5-7, and 17. Kankainen, [0065]; *supra* §§ X.C.1-X.C.3, X.C.5-X.C.7, X.C.11 (claims 1-3, 5-7, 17). Thus, Kankainen lends itself to simultaneously presenting the live view (video) and tactile feedback as part of the content and mapping information.

301. Ohnishi discloses a “pedestrian navigation device” for providing tactile feedback simultaneously with visual navigation and advantages thereof, as discussed in Ground 2. *Supra* § X.B (claim 12).

302. A POSITA would have found it obvious to generate tactile feedback based on the location of a first object (user’s destination) simultaneously with the presentation of the video showing the navigational route of Kankainen based on Ohnishi’s teachings.

a. Motivation to Combine

303. A POSITA would have been motivated to incorporate Ohnishi’s tactile feedback simultaneously with the video display into Kankainen’s augmented navigation for the same reasons discussed for Ground 2. *Supra* § X.B.1.a (claim 12, Motivation to Combine).

b. Expectation of Success

304. A POSITA would have had a reasonable expectation of success in configuring Kankainen’s device to provide Ohnishi’s tactile feedback being output with the video based on the location of the first object, such as a vibration “arrival pattern” or guide point-based vibration, for the reasons discussed for Ground 2. *Supra* § X.B.1.b (claim 12, Expectation of Success).

2. **[Claim 13] “The method of claim 1 wherein tactile feedback is output simultaneously with the presentation [of] the video, the tactile feedback being output based on a movement of the portable electronic device.”**

305. Kankainen in combination with Ohnishi renders obvious claim 13.

306. As discussed for claim 12, Kankainen and Ohnishi render obvious providing tactile feedback, such as a “vibration pattern,” based on the movement of the electronic device (e.g., change in detected location), for example, when the device is detected moving towards or arriving at a “guide point” along the route or arriving at “the destination.” *Supra* § X.E.1 (claim 12); Kankainen, [0065]; Ohnishi, [0128]-[0133], [0144].

307. A POSITA would have been motivated to include Ohnishi’s tactile feedback based on the movement of the electronic device simultaneously with the video navigation in Kankainen’s system, as recited in claim 13, for the reasons discussed in claim 12. *Supra* §§ X.E.1.a, X.E.1.b (claim 12, Motivation to Combine, Expectation of Success).

XI. CONCLUSION

308. For the reasons set forth in Section X, it is my opinion that one skilled in the art would have found claims 1-22 of the ’215 patent obvious.

309. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

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

Date: June 8, 2023

Respectfully submitted,

A handwritten signature in black ink, appearing to read "David H. Williams", written in a cursive style.

David H. Williams