

Petition for *Inter Partes* Review of
U.S. Patent No. 10,974,151 B2

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,
Petitioner

v.

MULLEN INDUSTRIES LLC,
Patent Owner.

Case IPR2025-00746
U.S. Patent No. 10,974,151 B2
Issue Date: April 13, 2021

Title: SYSTEMS AND METHODS FOR LOCATION BASED GAMES AND
EMPLOYMENT OF THE SAME ON LOCATION ENABLED DEVICES

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,974,151 B2**

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List of Exhibits

Exhibit No.	Description of Document
1001	U.S. Patent No. 10,974,151 B2 to Jeffrey David Mullen (filed Aug. 1, 2006, issued April 13, 2021) (“ 151 ” or “ 151 patent ”)
1002	Declaration of Jeremy Cooperstock, Ph.D. (“ Cooperstock ”)
1003	U.S. Patent App. Pub. No. 2003/0177187 A1 to David A. Levine et al. (filed Feb. 20, 2003; published Sept. 18, 2003) (“ Levine ”)
1004	’151 Patent File History
1005	Proof of Service of Complaint
1006	<i>Mullen Industries LLC v. Meta Platforms, Inc.</i> , Case No. 1:24-cv-354-DAE, Dkt. 64, Order (1) Adopting Report And Recommendation And (2) Granting In Part And Denying In Part Defendant’s Partial Motion To Dismiss (W.D. Tex. Jan. 29, 2025)

I. MANDATORY NOTICES UNDER §42.8(A)(1)

A. Real Party-In-Interest under §42.8.(b)(1)

Meta Platforms, Inc. is the real party-in-interest to this IPR petition.

B. Related Matters under §42.8(b)(2)

The '151 patent was the subject of pending litigation involving Petitioner: *Mullen Industries LLC v. Meta Platforms, Inc.*, Case No. 1:24-cv-00354-DAE (W.D. Tex.). Petitioner was served on April 5, 2024. (EX1005, p.003.) The '151 patent was dismissed with prejudice from the pending litigation against Petitioner on January 29, 2025. (EX1006, p.007-009.)

Petitioner is filing IPR petitions against twelve related patents asserted by Patent Owner in the pending litigation involving Petitioner:

U.S. Patent No.	IPR Case
8,585,476 B2	IPR2025-00737
9,744,448 B2	IPR2025-00738
10,179,277 B2	IPR2025-00739
10,828,559 B2	IPR2025-00740
10,967,270 B2	IPR2025-00702
11,033,821 B2	IPR2025-00703
11,376,493 B2	IPR2025-00741
11,904,243 B2	IPR2025-00742
11,947,716 B2	IPR2025-00743
12,019,791 B2	IPR2025-00744
9,662,582 B2	IPR2025-00745

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U.S. Patent No.	IPR Case
10,974,151 B2	IPR2025-00746

C. Lead and Back-Up Counsel under §42.8(b)(3)

Petitioner provides the following designation of counsel.

LEAD COUNSEL	BACK-UP COUNSEL
Heidi L. Keefe (Reg. No. 40,673) hkeefe@cooley.com COOLEY LLP ATTN: Patent Group 1299 Pennsylvania Ave. NW, Suite 700 Washington, DC 20004 Tel: (650) 843-5001 Fax: (650) 849-7400	Phillip E. Morton (Reg. No. 57,835) pmorton@cooley.com Andrew C. Mace (Reg. No. 63,342) amace@cooley.com Mark R. Weinstein (Admission <i>pro hac vice</i> to be requested) mweinstein@cooley.com Lowell D. Mead (Admission <i>pro hac vice</i> to be requested) lmead@cooley.com Patrick Lauppe (Admission <i>pro hac vice</i> to be requested) plauppe@cooley.com COOLEY LLP ATTN: Patent Group 1299 Pennsylvania Ave. NW, Suite 700 Washington D.C. 20004

D. Service Information

This Petition is being served by Federal Express to the attorney of record for the '151 patent, 32733 - JEFFREY D. MULLEN, 2212 Hassinger Lane, Glenshaw,

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PA 15116. Petitioner consents to electronic service at the addresses provided above
for lead and back-up counsel.

II. FEE PAYMENT

Petitioner requests review of three claims, with a \$51,875 payment.

III. REQUIREMENTS UNDER §§ 42.104 AND 42.108 AND CONSIDERATIONS UNDER §§ 314(A) AND 325(D)

A. Grounds for Standing

Petitioner certifies that the '151 patent is available for IPR and that Petitioner
is not barred or otherwise estopped.

B. Identification of Challenge and Statement of Precise Relief Requested

Petitioner requests IPR institution based on:

Ground	Claims	Basis for Challenge under §103
1	1-3	Obvious over Levine

Submitted with this Petition is the Declaration of Jeremy Cooperstock, Ph.D.
(EX1002) (“Cooperstock”), a qualified technical expert. (EX1002, ¶¶1-18, App. A.)

C. Considerations Under §§ 314(a) and 325(d)

§314(a): The *General Plastic* factors are not relevant as this is the first and
only IPR petition filed by Petitioner with respect to the '151 patent.

Nor do the *Fintiv* factors support discretionary denial under §314(a). First, as
noted above, there is no parallel litigation involving Petitioner and the '151 patent

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because the '151 patent was dismissed with prejudice from the pending litigation against Petitioner on January 29, 2025. (EX1006, p. 007-009.) Second, in addition to the dismissal of the '151 patent, the pending litigation is in a relatively early stage, with little substantive discovery having taken place to date and claim construction proceedings ongoing. Trial is scheduled to start October 5, 2026—over eighteen months from now—and a motion to transfer the case by Petitioner to the Northern District of California is currently pending, which if granted would likely result in an even later trial date. Petitioner also intends to move to stay the litigation pending resolution of the IPRs. Additionally, to allay concerns over duplication of efforts, Petitioner represents that, in the event of institution, it will not pursue in litigation any invalidity defense that was or could have been raised in IPR.

§325(d): This Petition does not raise a § 325(d) issue because the Levine prior art reference was not cited or otherwise identified during prosecution.

Petitioner reserves the right to address and respond to any assertions that Patent Owner may raise regarding discretionary factors.

IV. OVERVIEW OF THE PATENT

A. Level of Ordinary Skill

A person of ordinary skill would have possessed a bachelor's degree in electrical engineering, computer science, or similar field, with two years combined experience in designing and/or developing interactive location-based computer

systems/software, such as video games or other simulations incorporating location information. A person could also have qualified as a person of ordinary skill in the art with some combination of (1) more formal education (such as a master's of science degree) and less technical experience, or (2) less formal education and more technical or professional experience. (EX1002, ¶¶21-25.)

B. Specification Overview

The '151 patent purports to provide “an actual, reality-based video game in which a user's physical (actual) location on a playfield, reflects a virtual game character's virtual location in a video game environment.” ('151, 2:30-35.) A user may play the game on devices such as a “wireless telephone” or other devices such as “laptops, Personal Digital Assistants (e.g., PDAs), Blackberries, Personal Electronic Device (PED), iPODs, or any other portable electronic device.” ('151, 7:21-27.) Each player may choose from one of a variety of “characters” to play. ('151, 11:51-57.) In addition to human players who control characters, the game may include “software-controlled gaming characters (e.g., video game characters with artificial intelligence).” ('151, 14:48-51.)

V. CLAIM CONSTRUCTION

Petitioner does not believe express claim construction is necessary at this time. The prior art cited herein, as demonstrated below, renders the challenged

claims obvious under any reasonable construction. Petitioner therefore respectfully submits that, for purposes of this IPR, express constructions are not required.

VI. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Overview of Ground

Before September 2003, the relevant concepts of the '151 patent were well-known in the prior art. The “Background of the Invention” in the '151 patent does not fully address the rich field of relevant prior art. (*See* '151, 1:23-2:26.) Online multi-player games were well-known, and location-based games to be played on mobile devices had been extensively described. First-person action games were widespread (such as Doom, Quake, and many others), as were third-person action games where the player could view their character performing actions in the game (such as games from the Grand Theft Auto and Hitman titles). Games with non-player characters having some form of “artificial intelligence” were also well-known: one or more human players would manually control characters in the game, while software programming controlled the activities of non-player characters in the game. It should come as no surprise that in this deep and broad field of relevant prior art, nothing in the challenged claims is novel and non-obvious, as explained further below. (Cooperstock, ¶49.)

This petition relies upon Levine (**EX1003**), which discloses and/or renders obvious every element of the challenged claims. Levine teaches a location-based

online multi-player game with the same relevant features as the '151 patent, described in terms that are strikingly similar to the '151 patent's description. Much like the '151 patent, Levine describes “a distributed, platform-sensitive, location-based, contextual system, method and computer program product for bridging activities in real and virtual environments within the context of multi-user gaming” and other applications. (Levine, ¶0163.)¹ Levine's online game system “accounts for both the physical and virtual location and context of the participating devices and people” to serve “the purpose of coordinating activities in the real (i.e., physical) and virtual worlds.” (Levine, ¶0158.)

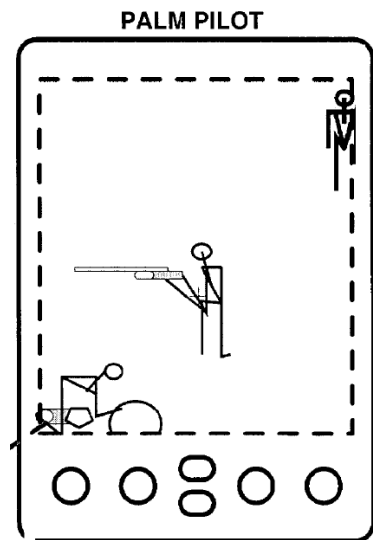
Like the '151 patent, Levine describes that a user may play its online game with a wireless telephone (a mobile phone) or various other type of devices. (Levine, ¶0187 (“client devices **112** would include, for example, a mobile phone **112a**, a video game console (with Internet connection) **112b**, a personal digital assistant **112c**, a personal area network with retinal projection displays and/or ear piece **112d**; a laptop **112e**, and a desktop computer **112f**”).)

Like the '151 patent, Levine describes that each player may play a character in the game, which is represented by an “avatar.” (Levine, ¶¶0224, 0244, 0324-0327.) Like the '151 patent, Levine also describes characters in the game that are

¹ All underlining added to quoted material unless noted.

controlled by the system as opposed to being controlled by a human player, such as “non-player character” (NPC) entities which are controlled with “artificial intelligence.” (Levine, ¶¶0394 (describing “Active Objects (NPCs)—non-player controlled objects”), 0629 (describing “Non-Player Characters (NPCs) that may have an independent life of their own; that walk and talk, or run and hide, or perform other changes of state actively of their own accord” with “[s]ome sort of Artificial Intelligence (AI)”), 0186 (describing “elements of the application not directly controlled by users, such as artificial intelligence or aspects of a simulation that run on their own internal logic and react to other aspects of the simulation”).)

Levine provides extensive description and discussion of its location-based online gaming system throughout its disclosure, including architectural and system-level components and features as well as example illustrations of games. Among the example illustrations are a location-based game where players interact with a “monster” and a location-based game with a “sniper” that is illustrated in Figures 45-47 (Figure 47 excerpted at right, illustrating sniper gameplay on Palm Pilot device). (Levine, ¶¶0659-0673 (“monster” game), 0556-0573 & Figs. 45-47 (“sniper” game).)



B. Prior Art Status of Relied-Upon References

Pre-AIA law applies to the challenged claims. Levine (EX1003) qualifies as prior art under § 102(e) because it is a published U.S. patent application that was filed before the priority date.²

C. Ground 1: Claims 1-3 are Obvious Over Levine

1. Independent Claim 1: “A system comprising:” (Claim 1[pre])

The preamble of claim 1 recites “[a] **system comprising.**” Levine discloses a system for a multiplayer online game that renders obvious claim 1 as discussed further below. (*See, e.g.*, Levine, Abstract, ¶¶ 0161, 0179, 0211, and citations below for the elements of claim 1.)

² The ’151 patent claims priority to a provisional application (no. 60/499,810) filed September 2, 2003. For purposes of this Petition only, Petitioner has assumed a priority date of September 2, 2003. Petitioner at this time expresses no opinion on whether the ’151 patent is actually entitled to the benefit of the provisional application filing date. This issue is not relevant here because all of the prior art references relied upon pre-date September 2, 2003. In the event entitlement to the provisional filing date or another earlier priority date may later become relevant, Petitioner reserves the right to respond at that time.

(a) **“a wireless telephone having a locating device and a display,” (Claim 1[a])**

Levine discloses **“a wireless telephone having a locating device and a display.”** As explained below, Levine describes that players of a multiplayer online game may use a mobile phone (**“wireless telephone”**) that includes an orientationally-aware peripheral (OAP) device (**“locating device”**) and a **“display.”**

Levine discloses a system for users of mobile devices, such as mobile phones and personal digital assistants (PDAs), to participate in location-based games. Levine describes that the client device used by a user to play the game may be a **“mobile phone,”** disclosing a **“wireless telephone”**:

Another feature of the present invention is that, aside from personal computers, workstations and terminals connected to the Internet, it allows mobile phones, wireless data devices, PDAs and the like, which are commonly owned by today’s consumers, to represent opportunities to where users can participate in multi-person, interactive applications.

(Levine, ¶0161; Cooperstock, ¶58.)

Specifically, Levine discloses various client devices **112** that may participate in the game, which include mobile phone client device **112a** that discloses a **“wireless telephone”** as claimed:

Connected to the transportation network (e.g., global Internet **103**), outside of the LAN **101**, includes a plurality of external client devices **112** that allow users (i.e., players) to remotely access and use Grid

system **100**. External client devices **112** would include, for example, a mobile phone 112a, a video game console (with Internet connection) **112b**, a personal digital assistant **112c**, a personal area network with retinal projection displays and/or ear piece **112d**; a laptop **112e**, and a desktop computer **112f**.

(Levine, ¶0187; Cooperstock, ¶59.)

Levine further discloses that the mobile phone **112a** may include a “**display**” as claimed. (Cooperstock, ¶60.) Levine explains that the mobile phone may provide a “graphic display” that may display, for example, a visual representation of a “monster” in a game:

In step 5812, the laptop user sends a message to a user on a mobile phone client device 112a (“mobile user”). Such message, for example, would convey that “a new ‘monster’ character is two blocks from you.” This message may be sent because the mobile user is represented in the synthetic environment as being on Wall Street in New York City because in the physical world, they are.

In step 5814, the mobile user receives a signal (e.g., audio indication, text message, voice mail message, graphic display, etc.) on client device 112a reflecting the laptop user’s message sent in step 5812.

(Levine, ¶¶0664-0665.)

In step 5818, the synthetic representation of the “monster” character would disappear from the PC user’s, laptops user’s and mobile user’s client devices.

In addition to Levine’s disclosures, a person of ordinary skill in the art would have understood that before 2003, the prior art disclosed numerous wireless telephones with display screens of varying types and sizes, including display sizes that were amply sufficient to display interactive games including display of multiple characters in Levine’s multi-player online game. (Cooperstock, ¶61.) To help visualize video games on mobile phone screens prior to 2003, Petitioner provides some demonstrative example illustrations below.

For example, the Internet Archive Wayback Machine captured webpages from before 2003 that show screenshots from mobile phone displays with games on them.⁴ As one example, the Nokia website in 2002 advertised phones such as the Nokia 7650:

³ Petitioner notes that it is not clear whether the specific example “Mobile Phone 112a” depicted in Figure 1 of Levine includes a display, but as explained above, Levine discloses that mobile phone **112a** may include a graphic display. (Cooperstock, ¶60 n.3.)

⁴ “The Internet Archive Wayback Machine is a service that allows people to visit archived versions of Web sites. Visitors to the Wayback Machine can type in a URL,

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Take a closer look at the Nokia 7650 phone with our interactive Flash demo. Click arrow to slide the keypad open or shut. Click and drag the phone horizontally to rotate it.



(Nokia website⁵)

select a date range, and then begin surfing on an archived version of the Web.”

<https://help.archive.org/help/wayback-machine-general-information/>.

5

[https://web.archive.org/web/20021201081202/http://www.nokia.com/cda1/0,1080,](https://web.archive.org/web/20021201081202/http://www.nokia.com/cda1/0,1080,825,00.html)

[825,00.html](https://web.archive.org/web/20021201081202/http://www.nokia.com/cda1/0,1080,825,00.html) (archive page dating from 2002-12-01). The Internet Archive website

explains the date encoded in the URL: “Pay attention to the date code embedded in

the archived url. This is the list of numbers in the middle; it translates as

yyyymmddhhmmss. For example in this url

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Nokia's website also provided downloadable "games available for phones that use the Symbian operating system (for example the Nokia 9210, Nokia 9290 and Nokia 7650)"⁶ and provided the following screenshots of video games including "Regular Games" and "Premium Games":



(Nokia webpage⁷)

<http://web.archive.org/web/20000229123340/http://www.yahoo.com/> the date the site was crawled was Feb 29, 2000 at 12:33 and 40 seconds.”

<https://help.archive.org/help/using-the-wayback-machine/>.

6

<https://web.archive.org/web/20021201105651/http://www.nokia.com/games/downloads.html> (archive page dating from 2002-12-01)

7

<https://web.archive.org/web/20021201105651/http://www.nokia.com/games/downloads.html> (archive page dating from 2002-12-01)

“9 More Lives” Game



(Nokia webpage)⁸

“Bounce” Game



(Nokia webpage)⁹

⁸

<https://web.archive.org/web/20021216204437/http://www.nokia.com/games/92xx/9ml.html> (archive page dating from 2002-12-16)

⁹

<https://web.archive.org/web/20021216204039/http://www.nokia.com/games/92xx/bounce.html> (archive page dating from 2002-12-16)

Similarly, game developer Gameloft released video games for mobile phones, including numerous games released in 2002 and earlier. (Cooperstock, ¶63.) Below are illustrative screenshots of mobile phone games on the Gameloft website from 2002:



(Gameloft webpage¹⁰)



¹⁰ <https://web.archive.org/web/20021128014421/http://gameloft.com/> (archive page dating from 2002-11-28).

(Gameloft webpage¹¹)

The same types of mobile phone game screen displays were reflected in print publications. (Cooperstock, ¶64.) For example, below is a page reproduced from the February 2002 issue of *Mobiles* (a French language magazine), illustrating screen displays for games on mobile phones.¹²

¹¹ <https://web.archive.org/web/20021128014421/http://gameloft.com/> (archive page dating from 2002-11-28).

¹²

<https://books.google.com/books?id=ZFwEAAAAMBAJ&pg=PA44#v=onepage&q&f=false>.

TENDANCE

Un best-seller à la sauce mobile

Puissance 4

Ce jeu est édité par Mobistation et se joue à deux par l'intermédiaire de SMS. Pour y accéder, il faut être client Orange et inviter un adversaire de son choix à jouer en tapant le nom du jeu : « X4 » suivi d'un espace et du numéro de téléphone de son adversaire au numéro suivant : 20555.

Vous trouverez plus d'informations sur le site www.orange.fr.

Les jeux par SMS

En attendant de pouvoir véritablement jouer en réseau, les opérateurs proposent de jouer par minimessage.

Battlemail C'est la bataille !

Défiez l'un de vos amis. Première étape, entrez son numéro de téléphone, puis choisissez un personnage parmi les

5 proposés : son cri de victoire et ses gestes d'attaque et de défense qui lui permettront de battre son adversaire. Lorsque le défi est accepté, le combat peut commencer. Vous ver-

Battlemail, un jeu passionnant pour défier ses amis par l'intermédiaire de SMS.

rez alors se dérouler un film d'animation au cours duquel les 2 personnages s'affrontent. Ce jeu fonctionne sur Siemens C45, S45, ME45 et sur PC connecté à Internet.



Rayman Bowling

Ce jeu compte 20 niveaux originaux et variés avec une multitude d'obstacles traversant la piste, des attaques ennemies et autres pièges en tout genre. Les fans du personnage retrouveront leur univers familier : la forêt des songes, le ciel chromatique, les montagnes bleues, la cité des images et les caves de skops.

Et la couleur fut

Nokia 9210, Ericsson T68, Trium Eclipse... Les téléphones à écran couleur commencent à faire leur apparition. Ils ouvrent de nouvelles perspectives ludiques. Ainsi Gameloft (Ludigames) a développé deux jeux Rayman pour le Trium Eclipse.



Du sport sur Nokia

Le Finlandais n'est pas en reste... Sur le 9210, 8 jeux sont disponibles : Triple Pop, Bounce, Golf, 9 more lives, Virtually Board, Snowboarding, Snake Ex, Soccer et Card Deck.



Rayman garden

Les Luma sont des boules de cristal cachées dans le jardin de Rayman. Celui-ci doit les retrouver en évitant les périls qui le guettent un peu partout : troncs, murs, feuilles, champignons toxiques, boules piquantes et piranhas.



Qu'est-ce que le téléchargement In-Fusio ?



In-Fusio édite des jeux interactifs sur téléphones mobiles depuis mars 2000. Ses premières applications étaient embarquées et distribuées par France Télécom Mobiles (aujourd'hui Orange) sous le nom Les Games. La société s'est ensuite tournée vers le téléchargement de jeux

et a mis au point un moteur destiné à cet effet, baptisé ExEn, pour Execution Engine en septembre 2000. Basé sur le langage standard Java, ExEn est uniquement dédié au jeu. Implémenté dans les téléphones (Philips, Sagem, Siemens, Trium), ExEn est compatible avec

tous les standards existants et à venir (GPRS, UMTS). Le téléchargement dure moins de 3 minutes, après lesquelles chaque joueur dispose d'un jeu « à vie » dans son téléphone. Il peut aussi participer à des concours et gagner des lots (scooters, lecteurs DVD, skateboards...).



In-Fusio propose une ludothèque à télécharger. Pour cela, Rendez-vous : www.orange.fr/espclients/divertir/games/

To be clear, these images are not relied upon as “prior art” for purposes of Petitioner’s obviousness analysis. Instead, as noted previously, they are merely some demonstrative example illustrations of how a person of ordinary skill in the art would visualize video games on mobile phone screens prior to 2003.

Levine further teaches that each client device **112** (which includes mobile phone **112a**) may include within it an orientationally-aware peripheral (OAP) device, which discloses the claimed “**locating device**.” (Cooperstock, ¶¶66-69.) Levine teaches that the OAP device is for “tracking the locating and orientation of users within the system.” (Levine, ¶0155; *see also id.*, ¶0197 (“[A]n orientationally-aware peripheral (OAP) device, described in detail below, may be included within Grid system **100** within each client device **112**.”).)

Levine further details how the OAP device is used to track the “**location**” of players in the system by incorporating an OAP device into each client device **112** used by players:

Latitude, longitude and other sets of **location** data are often integral to the applications executed within Grid system **100**. Such location awareness allows software agents to traverse physical terrains and physical entities such as people, buildings and vehicles to be represented in virtual worlds. Therefore, in addition to existing systems such as GPS and the like, inertial tracking can be used to track the **location** and orientation of players within system **100**.

In an embodiment of the present invention, an orientationally-aware

peripheral (OAP) device, described in detail below, may be included within Grid system **100** within each client device **112**.

Referring to FIG. 3, a block diagram representing the architecture of an orientationally-aware peripheral (OAP) device **300** according to an embodiment of the present invention is shown. OAP device **300** includes an inertial tracking subsystem **330** and a communication subsystem **320**. Inertial tracking subsystem 330 employs six accelerometers that will track the placement and orientation of the peripheral device in six degrees of freedom (“6-DOF”). Such a design eliminates the need for separate gyroscopic sensors to determine orientation information. The six accelerometers are divided into three groups of two sensors each (i.e., accelerometers pairs **302**, **304** and **306**) oriented along each of three perpendicular axes. Each pair of accelerometers is separated as far as is possible on the platform. By correctly integrating the acceleration of all six sensors, both position and angular orientation can easily be calculated.

(Levine, ¶¶0196-0198; Cooperstock, ¶67.)

As noted in the excerpted passage above, the OAP device provides inertial tracking, which “can be used to track the location and orientation of players” within the system. (Levine, ¶0196.) Levine further reiterates that “users’ locations can be geographically tracked” by inertial tracking as provided by the OAP device. (Levine, ¶0162 (“[U]sers’ locations can be geographically tracked, via a Global Positioning Satellite (GPS) system, cell-based triangulation, dead-reckoning (i.e., inertial tracking) or the like as described herein, in order to provide more realistic

content, more realistic interactive experience to users, or data which is more contextually relevant to the user.”.)

Levine further notes that the OAP device calculates “position.” (Levine, ¶0198 (“both position and angular orientation can easily be calculated”).) Levine notes that “position” is recorded as “where this object is located in the game world.”

Each object in every game has an entry in the Thing table. The Thing table controls the behavior of objects across the Grid, and maintains their common basic states: position, orientation, range, presence, region of interest type, whether they are active or passive in nature. It includes definitions for the following properties: . . .

d) Position—where this object is located in the game world. Also provided are Velocity and Acceleration for rectilinear motion.

(Levine, ¶¶0232-0236.)

(b) “wherein a location-based video game is operable to be played on said wireless telephone,” (Claim 1[b])

Levine discloses that “**a location-based video game is operable to be played on said wireless telephone.**” (Cooperstock, ¶¶70-82.)

Levine describes a system for providing a location-based video game that can be played on the wireless telephone (mobile phone). Levine describes an online game system for playing multiplayer games:

The present invention is directed to a system, method and computer program product for a computing grid for massively Multiplayer on-line games and simulations that substantially obviates one or more of

the problems and disadvantages of the related art.

(Levine, ¶0021.) Levine describes a system architecture for hosting games, such as a Game Server, a Grid, and a database that maintains game-related information. (Levine, ¶¶0176 (describing “Game Server”), 0179 (describing “Grid”), 0211 (describing “database”), Abstract.)

For purposes of analyzing the **“location-based video game”** claim limitation, Petitioner considers the features and functions that a person of ordinary skill in the art would have understood and found obvious to be present in a game in Levine’s system, in view of Levine’s teachings. (Cooperstock, ¶72.) Levine’s disclosure is not limited to any one or more specific games. Instead, Levine broadly teaches a variety of features, functions, and components to be used in implementing a multiplayer online location-based game system. (Cooperstock, ¶72.) Levine describes, for example, (1) design features generally applicable to the system’s online games, (2) a “Gaming Example” with a “monster” character that players can “kill” (Levine, ¶¶0656-0666), (3) “Alternate Embodiments” of the “monster” game including functions such as running away from the “monster” (Levine, ¶¶0668-0673), (4) a “sniper” game that is provided for “illustration” and reflected in Figures 45-47 (Levine, ¶¶0556-0558, 0569-0573, Figs. 45-47), and (5) additional examples of features, characters, and objects that may be present in a game, such as a “Dragon or a Troll,” a “dog” that “brushes against [a] flower,” actions of “picking up a gold

coin, striking a sword blow, losing stamina,” and others (*e.g.*, Levine, ¶¶0394, 0574, 0628, 0652). In view of these teachings, a person of ordinary skill in the art would have understood that each disclosed game and feature is a non-limiting illustration of how Levine’s teachings may be applied. (Cooperstock, ¶72.) A person of ordinary skill in the art would have considered ways to apply Levine’s teachings when implementing a game. (*Id.*) As explained in *Boston Scientific Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982 (Fed. Cir. 2009), “[c]ombining two embodiments disclosed adjacent to each other in a prior art patent does not require a leap of inventiveness.” 554 F.3d at 991. Therefore, for example, a person of ordinary skill in the art would have understood that features present in the “monster” game may be implemented in the “sniper” game and vice versa. (*Id.*) This interchangeability of gameplay features would be particularly appreciable given the similarities between the “monster” and “sniper” games, including the location-based gameplay of characters approaching and retreating from each other and the roles of the characters being adversarial with “shooting” capability (for example, a “monster” versus other players that can “shoot” and “kill” the monster, and a “victim” versus a “sniper” having “a rifle scope” consistent with the capability to shoot the rifle). (*E.g.*, Levine, ¶¶0676 (“shooting a ‘monster’”), 0666 (mobile user character can “kill the ‘monster’ character”), 0571-0573 (“sniper” and “victim” characters, where victim may be “in range” of the sniper because “the sniper may have a rifle scope”),

Figs. 45-47 (showing sniper character pointing a rifle), ¶0252 (“A PROPERTY_VECTOR state could represent the direction in which a game character’s gun is pointed.”); Cooperstock, ¶72.)

In view of the foregoing and the following, Levine discloses and renders obvious a “**location-based video game**” as claimed. (Cooperstock, ¶¶71-73.) Levine describes that its system provides “**location-based**” games. As Levine describes, each game depends on the physical and virtual locations of the devices and people that play the game, and coordinates activities between locations in the real world and locations in the virtual world:

The system, method and computer program product of the present invention accounts for both the physical and virtual location and context of the participating devices and people. The system, method and computer program product also provide for both synchronous and asynchronous communications between people, computers, other devices and computers for the purpose of coordinating activities in the real (i.e., physical) and virtual worlds.

(Levine, ¶0158.)

Another feature of the present invention is that users’ locations can be geographically tracked, via a Global Positioning Satellite (GPS) system, cell-based triangulation, dead-reckoning (i.e., inertial tracking) or the like as described herein, in order to provide more realistic content, more realistic interactive experience to users, or data which is more contextually relevant to the user.

The present invention is a distributed, platform-sensitive, location-based, contextual system, method and computer program product for bridging activities in real and virtual environments within the context of multi-user gaming, entertainment, simulation, collaborative, and e-commerce applications. In aggregate, it is referred to as the “Grid.”

(Levine, ¶¶0162-0163.)

Latitude, longitude and other sets of location data are often integral to the applications executed within Grid system 100. Such location awareness allows software agents to traverse physical terrains and physical entities such as people, buildings and vehicles to be represented in virtual worlds.

(Levine, ¶0196.)

Database 104 stores the various types of information that Grid system 100 would need to store in order to provide the bridging of activities in real and virtual environments in the context of multi-user gaming, entertainment and e-commerce applications. Such information, includes user registration information (name, address, billing information, etc.), device 112 registrations, device 112 capabilities (e.g., polygon rendering capability, media formats, operating systems, available peripherals, color versus black-and-white display, etc.), user permissions (e.g., who is allowed to access portions of the bridged environment and what actions they may perform on those parts) and user ownership of synthetic entities and environment objects, entity location information, game environments, game rules, themes and roles, etc., as will be apparent to one skilled in the relevant art(s) after

reading the teachings herein.

(Levine, ¶0206; Cooperstock, ¶73.)

For example, each of the “monster” and “sniper” games discloses a **location-based** game. (Cooperstock, ¶74.) In the “monster” game, a mobile user playing the game is physically located on Wall Street in New York City and in the game a “monster” is created with an attribute of being at a corresponding nearby location:

In step 5808, server **102** would cause the new “monster” character to be delivered to all other users playing the same instance of the interactive multi-user gaming application as the PC user. Such deliver[y] would be affected by translator **108**, under the control of server 102, via transportation network **103**. Further, the server would place the new “monster” character in a PC user-dictated location within the synthetic environment, say for example, the Wall Street area of New York City. . . .

In step 5810, a user on a laptop client device **112e** (“laptop user”) would now “see” the new “monster” character on their laptop. More specifically, the laptop user would see the “monster” character on the synthetic representation of Wall Street in New York City. Grid system **100** ensures that the “monster” character is properly rendered for each user utilizing a different type of client device **112**.

In step 5812, the laptop user sends a message to a user on a mobile phone client device **112a** (“mobile user”). Such message, for example, would convey that “a new ‘monster’ character is two blocks from you.” This message may be sent because the mobile user is represented in the

synthetic environment as being on Wall Street in New York City because in the physical world, they are. . . .

In step 5816, the mobile user can interact with “monster” character (i.e., manipulate the “monster” character entity). Such interaction would involve, for example, pressing *9999 on their mobile phone client device **112a** to kill the “monster” character. In step 5818, the synthetic representation of the “monster” character would disappear from the PC user’s, laptops user’s and mobile user’s client devices. Again, Grid system **100** would ensure that the “monster” character’s death would be properly rendered (using the proper signal) for each player’s different type of client device.

(Levine, ¶¶0660-0666.)

Levine further illustrates how the “monster” game is a location-based game because players may move locations in the physical world. For example, the human player in the real world may take a taxi, and the movement of the player in the real world corresponds to an activity of the player’s character in the game to “run away” from the “monster” in the game that result in a corresponding change of the player’s character’s location within the game:

In one embodiment, users of Multi-User Bridging system 100 may further bridge the synthetic environment with the physical environment. More specifically, in step 5816 of flow 5800, the mobile user may have taken a taxi in order to “run away” from (i.e., interact with) the “monster” character. . . .

In another embodiment of the present invention, as one skilled in the

relevant art(s) will appreciate after reading the description herein, if the mobile user's taxi ride takes them outside of the Wall Street area of New York City, then the synthetic representation of the mobile user would disappear from the PC user's and laptops user's client devices.

In another embodiment of the present invention, as one skilled in the relevant art(s) will appreciate after reading the description herein, a user may create an MP3 file that includes audio content (e.g., a recorded voice message) that is played on a registered client device owned by another player when that player enters a specific area of the synthetic or physical environment. For example, the PC user could specify that the “monster” character speaks each time another player enters a specific building located on Wall Street in New York City. That sound would be played, for example, on a player's mobile phone **112a** when they walk into the physical building, or on a player's PC **112f** speaker when a player's synthetic representation walks into the specified building.

(Levine, ¶¶0670-0672.)

The “monster” game is thus a “**location-based**” game. (Cooperstock, ¶¶74-76.) Gameplay depends on location—for example, as shown above, the mobile user is physically located on Wall Street in New York City, the game determines a location for the “monster” which is two blocks away from the mobile user, and the mobile user can “interact” with the “monster” located nearby and/or “run away” from the “monster” by changing locations in the physical world (for example, taking a taxi). (Cooperstock, ¶76.)

Levine's exemplary "sniper" game is also a **"location-based"** game. (Cooperstock, ¶77.) For example, the "sniper" and other characters (player-controlled avatars) such as "bicyclist" or "courier" and "victim" interact with each other, including the ability to "see" each other and "collide" with each other. The activities of the characters (avatars) in the game are based on the location of each player, which corresponds to the "POSITION" of each player's Avatar within its "Locale" of record. (Levine, ¶¶0569 ("In the example shown in FIG. 45, the area-of-interest of the 'sniper' Server Thing is the region centered about the POSITION of the embodiment-of-record of that Avatar on its Server-of-Record in its Locale."), 0556, 0557 ("FIG. 46 shows a Game Server of Record 4601 that includes a Locale of Record 4602 with a sniper standing inside the Locale of Record 4602. Box 4603 represents the sniper's region of presence, and box 4604 represents the sniper's region of interest."), 0571-0573, 0232-0236 ("Each object in every game has an entry in the Thing table. The Thing table controls the behavior of objects across the Grid, and maintains their common basic states: position, orientation, range, presence, region of interest type, whether they are active or passive in nature: . . . Position—where this object is located in the game world."), 0198-0204 (OAP device in each client device participating in the game determines and provides position information).)

Each of the “monster” and “sniper” games also discloses a “**video game.**” (Cooperstock, ¶78.) Each game is an interactive game with visual output that provides graphical displays to users playing the game and enables a player to interact with characters in the game.

The “monster” game, as discussed for Claim 1[a], displays to the mobile user a graphical depiction of the “monster” with which the mobile user player can interact and the game includes audio as well. (Levine, ¶¶0659 (describing creation of 3D and 2D “visual representation” of the “monster” character along with “audio content” and other information), 0665-0666, 0670-0672 (describing how the “monster” is displayed on client devices including mobile phone **112a** and will “disappear” after the mobile user interacts to “kill” the monster, the game system can “ensure that the ‘monster’ character’s death would be properly rendered (using the proper signal) for each player’s different type of client device,” and the “monster” character “speaks” when a player enters a specific building, with the sound played on mobile phone **112a** and other client devices).)

Similarly, the “sniper” game enables a player controlling the “sniper” to interact with other characters such as a “bicyclist” and a “victim,” including “seeing” another character and “colliding” with another character (for example, “the bicyclist colliding with the sniper”). (Levine, ¶¶0557, 0569, 0571-0573, Figs. 45-47.) Levine also teaches that its games can be played on video game consoles, confirming the

understanding that each interactive visual game is a “video game.” (Levine, ¶¶0160 (“video game consoles”), 0187 (“External client devices **112** would include, for example, a mobile phone **112a**, a video game console (with Internet connection) **112b**”)).)

Finally, Levine discloses and renders obvious that the location-based video game is “**operable to be played on said wireless telephone.**” (Cooperstock, ¶79.) As discussed for Claim 1[a], client devices that can participate in the online gameplay include mobile phone **112a** (“**said wireless telephone**”). For example, Levine describes that the “monster” game can be played by a “mobile user” on mobile phone **112a**, with the game represented by Figure 58 and control flow 5800. (Levine, ¶¶0657-0658, 664.) While Levine illustrates the “sniper” game embodiment with the player using a Palm Pilot as the client device (Levine, ¶0558), it would have been obvious to a person of ordinary skill in the art that the “sniper” game also could have been played on a mobile phone **112a** and other client devices, given Levine’s teachings that its online games can be played on any of a variety of client devices **112** including personal digital assistants (PDAs) like the Palm Pilot, mobile phones, and other devices, and Levine’s teachings to ensure proper rendering of characters (such as the “monster” character) across the various types of client device. (Levine, ¶0187 (listing examples of types of client devices **112**); Cooperstock, ¶79.)

To this end, Levine specifically teaches “cross-platform” delivery of the game across multiple client devices **112**, which includes mobile phone **112a**, to impose “the same interface on multiple platforms with similar displays and interface conventions.” (Levine, ¶0676; Cooperstock, ¶80.) Levine reiterates this teaching of cross-platform compatibility across different client devices **112** when discussing the illustrative “monster” game, including proper “display” rendering across the client devices. (*E.g.*, Levine, ¶¶0663 (“Grid system **100** ensures that the ‘monster’ character is properly rendered for each user utilizing a different type of client device **112**.”), 0666 (“Again, Grid system **100** would ensure that the ‘monster’ character’s death would be properly rendered (using the proper signal) for each player’s different type of client device.”), 0675 (“simultaneous display across multiple client devices **112** would occur when Grid system **100** ensures that the ‘monster’ character is properly rendered for each user utilizing a different type of client device **112**.”).)

In view of these teachings of cross-platform compatibility including ensuring the same interface (including displays) across various types of client devices **112** (including mobile phone **112a**), a person of ordinary skill in the art would have understood and found it obvious that the “sniper” game illustrated on an exemplary Palm Pilot device, with game features illustrated in Figures 45-47 including an exemplary Palm Pilot device shown in Figure 47, would also be playable from a wireless telephone such as mobile phone **112a** like the “monster” game example.

(Cooperstock, ¶¶80-82.) Levine thus renders obvious that the “sniper” game is another example of a location-based video game **“operable to be played on said wireless telephone.”**

- (c) **“first location-based control signals are operable to be utilized, at least in part, to control a location-based video game character in said location-based video game,”**
(Claim 1[c])

Levine discloses and renders obvious that **“first location-based control signals are operable to be utilized, at least in part, to control a location-based video game character in said location-based video game.”** (Cooperstock, ¶¶83-89.)

Levine discloses and renders obvious that the location information of each mobile user playing a game (**“first location-based control signals”**) is used to control each user’s avatar in the game (**“location-based video game character in said location-based video game”**), such as the avatar’s movement and location and whether the avatar sees other users or is seen by other users as a result. (Cooperstock, ¶84.) For purposes of this Petition, the **“location-based video game character”** includes (1) the mobile user’s character in the “monster” game, and (2) the “sniper” character as controlled by a mobile user in the “sniper” game.

Levine describes how location-based signals are generated from each client device that contains an OAP device, as discussed in Claim 1[a] above. (Cooperstock, ¶85.) As noted previously, Levine describes that “inertial tracking

can be used to track the location and orientation of players within system **100**” and teaches that the OAP device “within each client device **112**” contains an inertial tracking subsystem **330** using accelerometers from which “both position and angular orientation can easily be calculated.” (Levine, ¶¶0196-0198.)

Levine further describes that the “output of the inertial tracker” is communicated to other client devices playing the same game:

As mentioned above, OAP device **300** also includes communication subsystem **320**, where the output of the inertial tracker is received by a data translator **314** and communicated to other client devices **112** participating in the same instance of the multi-player, interactive game. One embodiment of the communication subsystem **320** would employ wireless communication protocols (such as Bluetooth, IEEE 802.11 or the like) to communicate with a nearby computer or base-station (and thus with translator **108**) via a transmitter **312**.

(Levine, ¶0204; Cooperstock, ¶86.) For example, Figure 3 illustrates the OAP device including its inertial tracking subsystem and communication subsystem:

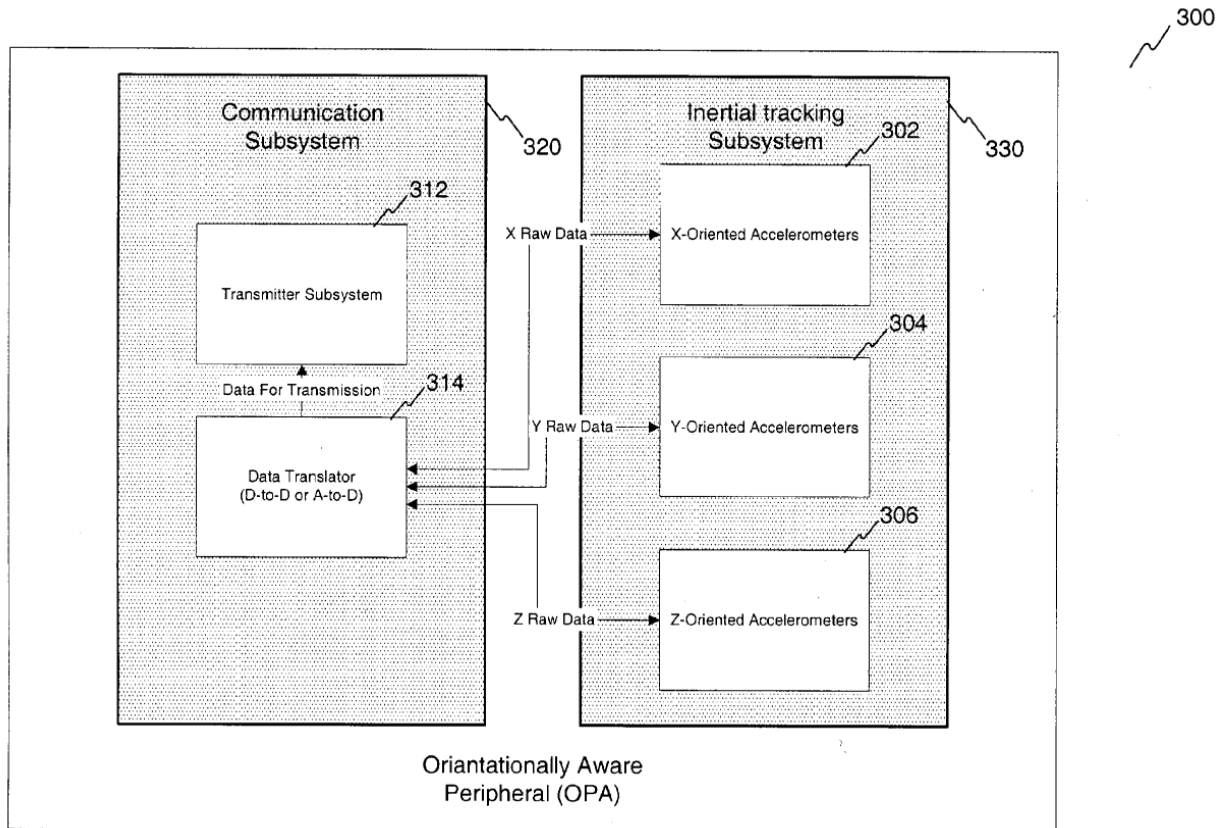


FIG. 3

(Levine, Fig. 3.)

The position information transmitted by the OAP and communicated to other client devices discloses and renders obvious **“first location-based control signals are operable to be utilized, at least in part, to control a location-based video game character in said location-based video game.”** (Cooperstock, ¶87.) A person of ordinary skill in the art would have understood and found it obvious that the transmitted position information is operable to be used to **control** the character of the player whose device transmits the location information. (*Id.*) For example, the location-based signals that originate from the OAP device are operable to **control**

the location-based video game character in the “monster” game. In that game, if a mobile user changes location in the real world (for example, taking a taxi to a different location), location-based control signals from the player’s device (for example, position signals from the OAP device in mobile phone **112a**) are operable, at least in part, to **control** the player’s location-based avatar in the location-based game (for example, controlling the position of the avatar within the game, which in turn determines whether or not the avatar is visible by other players).

In one embodiment, users of Multi-User Bridging system **100** may further bridge the synthetic environment with the physical environment. More specifically, in step 5816 of flow 5800, the mobile user may have taken a taxi in order to “run away” from (i.e., interact with) the “monster” character. If the mobile user also possessed a video camera client device **112**, the video stream of the taxi ride may be uploaded to server **102** (via transportation network **103** and translator **108**), so that the video stream of the mobile user running away from the “monster” character may be seen on the PC user’s and laptops user’s client devices.

In another embodiment of the present invention, as one skilled in the relevant art(s) will appreciate after reading the description herein, if the mobile user’s taxi ride takes them outside of the Wall Street area of New York City, then the synthetic representation of the mobile user would disappear from the PC user’s and laptops user’s client devices.

(Levine, ¶¶0670-0671; Cooperstock, ¶87.)

As described above, if the mobile user in the real world was in the Wall Street area of New York City and took a taxi to a different area, the change in location (such as reported by the OAP device in mobile phone **112a**) is operable to **control** a change in location of the corresponding location-based character in the game and cause the synthetic representation of the mobile user's character to disappear from other users' devices. Given Levine's description that each client's OAP device transmits location information to other client devices in the same game, a person of ordinary skill in the art would have understood and found it obvious that this transmitted information would be used to determine the location of each client device for use accordingly in the game. (Cooperstock, ¶88.)

Likewise, in the "sniper" game, a player controls the location-based "sniper" character through their client device, which obviously may be mobile phone **112a** as explained for Claim 1[b]. (See Levine, ¶¶0571-0572 (discussing "the client controlling the sniper"); Cooperstock, ¶¶89, 79-82.) The location information transmitted from the player's client device similarly would be understood to **control**, at least in part, the "sniper" character in the game, such as by enabling the "sniper" character to be "seen" by other characters (such as "bicyclist" or "victim") based on the location of the "sniper" when the "sniper" is located within view of other characters, and by causing "collision events" when the "sniper" has an overlapping

“region of presence” with another character. (Cooperstock, ¶89.) Levine describes these location-based features of the “sniper” game as follows:

FIG. 46 shows a Game Server of Record 4601 that includes a Locale of Record 4602 with a sniper standing inside the Locale of Record 4602. Box 4603 represents the sniper’s region of presence, and box 4604 represents the sniper’s region of interest. In other words, it is analogous to the sniper being as big as box 4603, and being able to see as far out as the boundaries of box 4604. The bicyclist seen in the lower left of 4604 is actually hosted on another host, on server 4605. The bicyclist is touching the region of presence 4603 of the sniper. Messages are routed about the bicyclist colliding with the sniper. In this figure, “updates of record” refer to a new user logging in. “Updates of interest” refer to one user “seeing” another user. “Updates of presence” illustrate collision events. Thus, FIG. 46 illustrates how packets are prioritized and routed based on interaction of Embodiments of Record that are on two different Game Servers 4601, 4605.

(Levine, ¶0557.)

In the example of FIG. 45, there would be a reference to the “sniper” Avatar on the list corresponding to the walking “victim” Avatar, and another reference to the “sniper” on the list corresponding to the bicycling “courier” Avatar. In order for the “sniper” to see the “victim”, he or she must receive messages as the walking Avatar moves back and forth. This implies that the victim is a packet source for messages to the sniper, which becomes a packet sink for messages about the changes in state of the Server Thing representing the89 walking Avatar. For the

“sniper” to collide with the courier, it must receive messages as the bicycling Avatar pedals here and there.

(Levine, ¶0571.)

(d) **“a manual control is operable to cause said location-based video game character to perform an action,”**
(Claim 1[d])

Levine discloses and renders obvious that **“a manual control is operable to cause said location-based video game character to perform an action.”**

(Cooperstock, ¶¶90-96.)

Levine describes a **“manual control,”** such as a button for a player’s avatar (**“location-based video game character”**), to **“perform an action”** (such as to “shoot” a monster character), as well as manual controls that cause a player’s character to perform other actions such as talking to another character.
(Cooperstock, ¶¶91-95.)

At the system level, Levine describes an “interface space” with **manual controls** such as “buttons and menus” activated by the user to affect the “action space” of the character/avatar in the game, such as “shooting a ‘monster’ character or talking to a character”:

Within Grid system **100**, there is a need to bridge not only RL and synthetic environments, but also the need to bridge platforms (i.e., various client devices **112**) so that users (on various platforms) share a common experience. That is, the delivery of the application delivered

by Grid system **100** must be “cross-platform” (i.e., imposing the same interface on multiple platforms with similar displays and interface conventions). It must also allow interface conventions that make sense on each platform by translating from the “interface space” (e.g., buttons and menus) to “action space” (e.g., shooting a “monster” character or talking to a character) in a fashion that is transparent to end-user/end-user platform **112**.

(Levine, ¶0676.)

Levine similarly describes that players’ avatars are controlled by “real people pushing buttons and twitching joysticks”:

Normally in the massively multi-player world, there are a multitude of objects. Avatar objects are Things connected to clients (real people pushing buttons and twitching joysticks somewhere out there on the Internet). Passive objects are Things that can be manipulated but aren’t connected to any other form of control mechanism (gold coins that can be picked up and put into inventory, flags to capture, etc).

(Levine, ¶0628.)

Levine illustrates an example of manual control in the “monster” game. Levine describes that a mobile user can provide a **manual control** (pressing *9999 on their mobile phone) to **perform an action** of shooting and killing the “monster”:

In step 5816, the mobile user can interact with “monster” character (i.e., manipulate the “monster” character entity). Such interaction would involve, for example, pressing *9999 on their mobile phone client device **112a** to kill the “monster” character. In step 5818, the synthetic

representation of the “monster” character would disappear from the PC user’s, laptops user’s and mobile user’s client devices.

(Levine, ¶0666.)

Levine also refers to this action of shooting/killing the monster in the system-level context, describing translating from “buttons” manually pressed by the player on the client device to actions taken by the player’s character in the game: “translating from the ‘interface space’ (e.g., buttons and menus) to ‘action space’ (e.g., shooting a ‘monster’ character or talking to a character).” (Levine, ¶0676.)

For the “sniper” game, Levine does not appear to explicitly describe a manual control of the player causing the “sniper” to shoot the sniper’s gun, but renders obvious a **manual control** causing the “sniper” character to **perform an action**. Levine describes “the client controlling the sniper” (Levine, ¶¶0571-0572), and a person of ordinary skill in the art would have understood and found it obvious that one manner of controlling the “sniper” would be a manual control for the player to cause the “sniper” to shoot the sniper’s rifle, similar to the manual control for shooting the “monster” in the monster game. (Cooperstock, ¶96.) Supporting this understanding, Levine describes that “the sniper may have a rifle scope” (Levine, ¶0573), describes a scenario where “the victim is ‘in range’ of the sniper” (Levine, ¶0572), describes that a “PROPERTY_VECTOR state could represent the direction in which a game character’s gun is pointed” (Levine, ¶0252), and describes one of

the characters in the “sniper” game as a “victim” (Levine, ¶¶0571-0573) which suggests that the “sniper” may shoot the “victim.” (Cooperstock, ¶96.)

(e) “said location-based video game character is operable to be displayed on said display,” (Claim 1[e])

Levine discloses and renders obvious that **“said location-based video game character is operable to be displayed on said display.”** (Cooperstock, ¶¶97-102.)

At the system level, Levine describes that characters in a game may be defined to have 3D and 2D visual representations that are displayed to players on their devices. (*E.g.*, Levine, ¶¶0659, 0675.) Levine also describes that a visual representation of each player is presented to other players, including in the “monster” game, though Levine does not provide an illustrative screenshot of the visual display in the “monster” game. (*E.g.*, Levine, ¶0671 (in the “monster” game, when a mobile user leaves the area of Wall Street, “then the synthetic representation of the mobile user would disappear from the PC user’s and laptops user’s client devices”).) Levine further illustrates the visual display of a player’s character on the screen of that player’s mobile device. For example, in the “sniper” game, the “sniper” character is controlled by a player with a client device such as the Palm Pilot. (Levine, ¶¶0571-0572 (discussing “the client controlling the sniper”).) Consistent with that description, Figure 47 shows the screen of a player’s Palm Pilot showing the “sniper” character, the “bicyclist,” and another character (such as the “victim”).

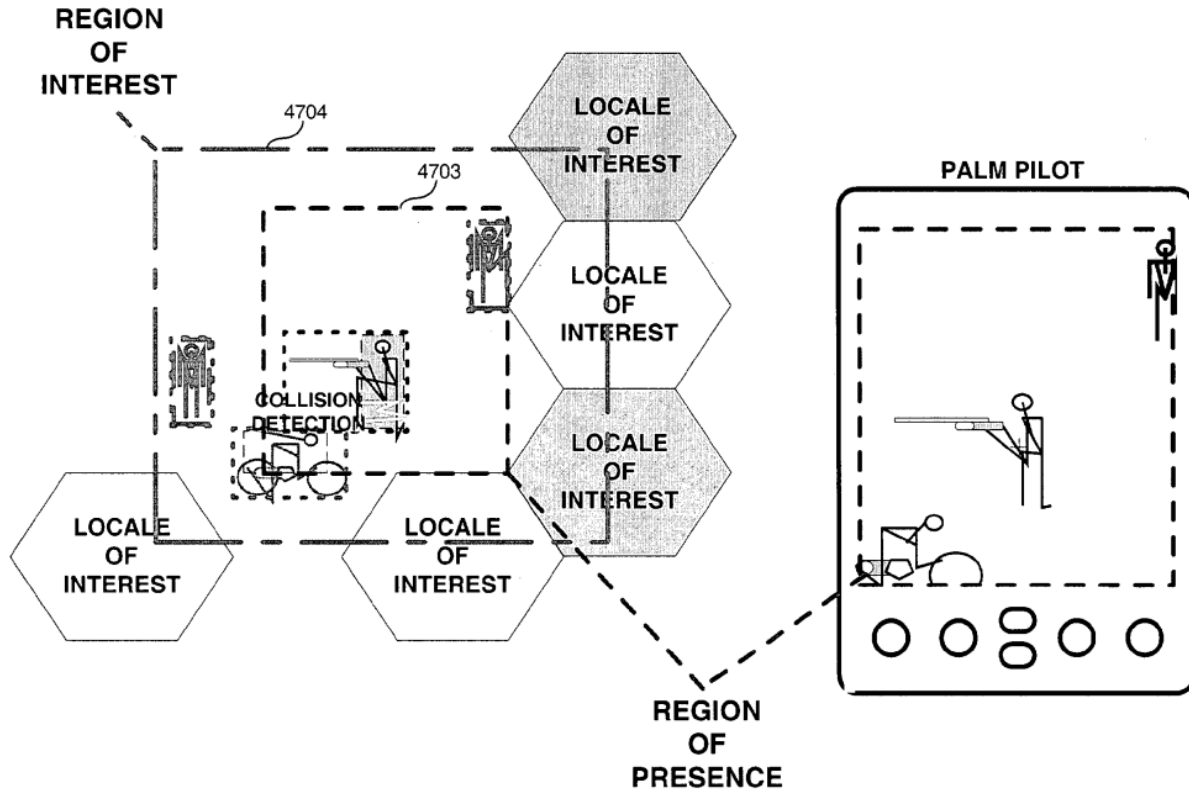


FIG. 47

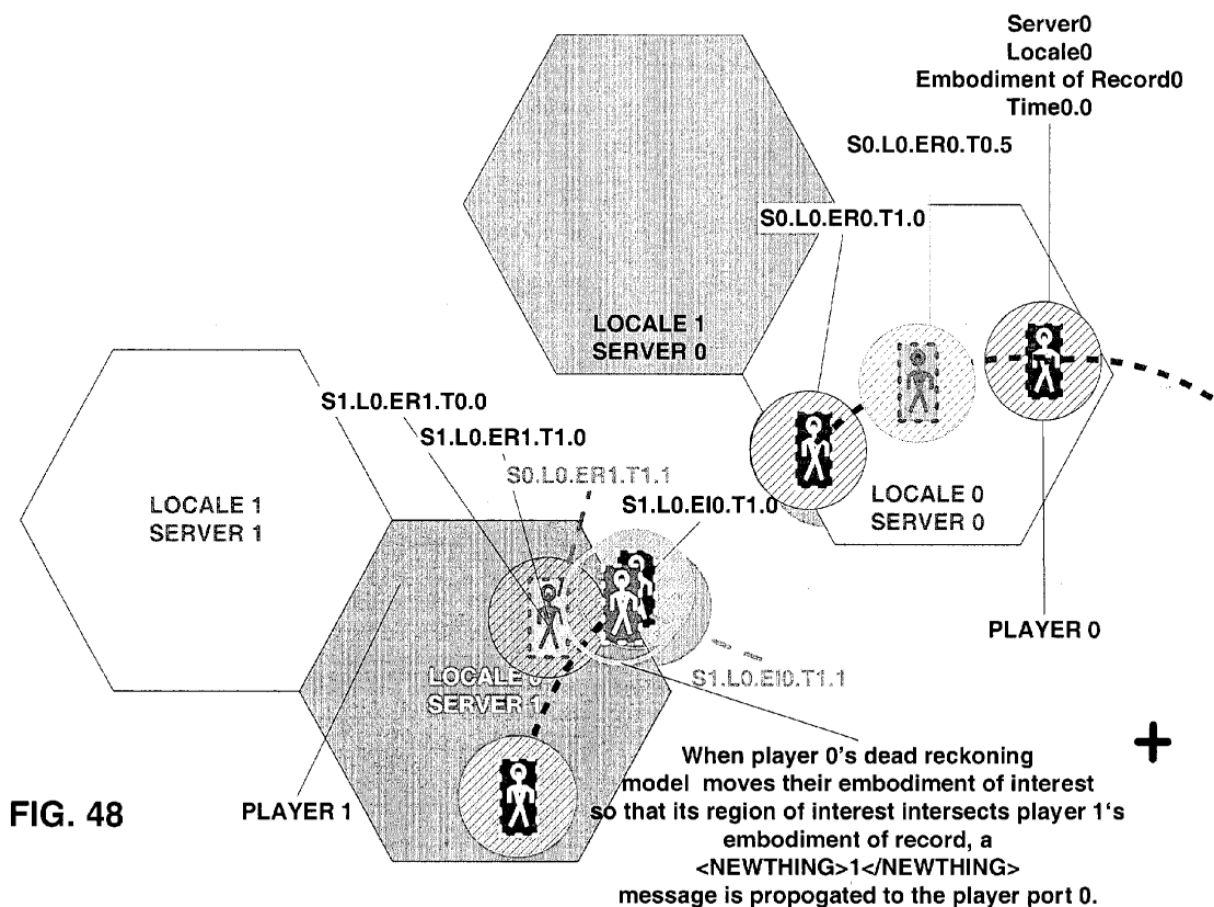
(Levine, Fig. 47.)

Further, referencing Figure 48, Levine also describes an example illustration of how two players with visual representations (“white figure against a black background” and “black figure against a white background”) may interact when their locations approach each other:

FIG. 48 illustrates the dynamic interaction between two players located on different Locales and/or different Game Servers **405**. In FIG. 48, Player 0 moves from right to left, as shown by the dotted line. The tag S0.L0.ER0.T0.0 in the figure refers to the following: S0 refers to Game Server 0, L0 refers to Locale Thread 0, ER0 refers to Embodiment of

Record 0, and T0.0 refers Time0.0. The other tags in FIG. 48 have a similar format. Player 1 is a “white figure against a black background”, and Player 2 is a “black figure against a white background”, initially at Locale 0, Server 1. The two Embodiments of Record gradually approach each other such that their regions of interest intersect.

(Levine, ¶0559.)



(Levine, Fig. 48.)

Although Figure 48 does not appear to provide a screenshot of a player's device, a person of ordinary skill in the art would have understood from the

description that it would have been obvious to display “Player 0” and “Player 1” in client devices in the game consistent with this description (“white figure against a black background” and “black figure against a white background”) to visually differentiate the two different players. (Cooperstock, ¶¶99-100.)

In view of these teachings, a person of ordinary skill in the art thus would have understood and found it obvious that where a mobile user is playing the game with a mobile phone, the mobile phone would **display** the player’s **location-based video game character**. (Cooperstock, ¶101.) For example, in the “sniper” game where the player is controlling the “sniper,” the player would see the sniper on the screen of the player’s client device as illustrated in Figure 47, and the player’s client device obviously could be a mobile phone for the reasons explained previously for Claim 1[b]. A person of ordinary skill in the art would have understood that for a player to be “controlling” the “sniper” character as Levine describes, the player’s client device naturally would display the “sniper” to the player so the player can see the character the player is controlling, consistent with Figure 47. (Cooperstock, ¶101.)

Similarly, although Levine does not provide an illustrative screenshot from the “monster” game, a person of ordinary skill in the art would have understood and found it obvious that where a mobile user plays the “monster” game with a mobile phone, the mobile phone would display a similar representation of the player’s character, for example to display the player’s character relative to the position of the

displayed “monster” so that the player could shoot and kill the monster or alternatively run away from the monster. (Cooperstock, ¶102.) Levine describes how a mobile user may play as a character in the “monster” game, including graphical display on the mobile user’s mobile phone, and it would have been obvious that the game would include display of the player’s character in the game. (Cooperstock, ¶102 (citing Levine, ¶¶0666, 0670, 0675-0676).)

- (f) **“a second video game character that is operable to be controlled via artificial intelligence, and is not controlled by manual-input, is operable to be displayed on said display, and” (Claim 1[f])**

Levine renders obvious **“a second video game character that is operable to be controlled via artificial intelligence, and is not controlled by manual-input, is operable to be displayed on said display.”** (Cooperstock, ¶¶103-111.)

Levine describes that its online multiplayer games include Non-Player Character (NPC) objects, which are “character” objects (as the name indicates) that are controlled via “artificial intelligence,” are not controlled by manual-input, and can be displayed on the display of the client devices participating in the game (including the claimed “wireless telephone”). (Cooperstock, ¶¶104-105.)

At the system level, Levine describes that online games include “Active objects” which include NPCs and are controlled via “artificial intelligence” as opposed to being “directly controlled by users,” as follows:

Grid system **100** also includes a Daemon Controller **108** which acts as

a privileged client for managing the activities of elements of the application not directly controlled by users, such as artificial intelligence or aspects of a simulation that run on their own internal logic and react to other aspects of the simulation.

(Levine, ¶0186.)

Active Objects (NPCs)—non-player controlled objects that operate as multiple sources of packets to others and provide a single sink for packets from others. The originator of NPC packets is the daemon (discussed below), a computer controller login account for each Locale with special privileges. The daemon manipulates active objects within a specific Locale, and their embodiments-of-record provides a multiple sources of packets to other clients. An example of an active object might be a Dragon or a Troll.

(Levine, ¶0394.)

Active Objects are objects, some of which are also known as Non-Player Characters (NPCs) that may have an independent life of their own; that walk and talk, or run and hide, or perform other changes of state actively of their own accord. These Non-Player Characters are not necessarily human characters. They may be animals, enchanted swords, or magic portals that take some positive role in directing game play. Some sort of Artificial Intelligence (AI) is attributed to this class of objects, and their object state changes appear to be directed by some sort of intelligent agent. Those changes of object state do not have to be physical ones. They may range from a proximity alarm that sounds a warning beacon if an Avatar approaches too closely to a morning

glory that furls its petals at the setting of the sun. In other words, Active objects do something on their own or respond to external stimuli without having to be controlled by a real person sitting at the controls.

(Levine, ¶0629.)

Each NPC in a game disclosing the claimed “first” video game character thus discloses a **“second video game character that is operable to be controlled via artificial intelligence, and is not controlled by manual-input.”** (Cooperstock, ¶106.) Further, a person of ordinary skill in the art would have understood and found it obvious that each game implemented using Levine’s online multi-player game system could include at least one such NPC, including for example the “monster” and “sniper” games. (Cooperstock, ¶106.) For example, in the “monster” game, Levine describes that the “monster” character is created with certain pre-defined characteristics including movement behavior that is not controlled by manual-input, and does not describe that the activities of the “monster” are controlled by manual-input from a player. (*E.g.*, Levine, ¶¶0659-0666 (creation of character to “define how the ‘monster’ character moves within the synthetic environment (e.g., x,y position to x’,y’ position at z rate)” and corresponding gameplay).) A person of ordinary skill in the art thus would have found it obvious to implement such a “monster” as an NPC controlled by artificial intelligence, in view of Levine’s teachings of “active object” characters that are controlled in a manner “not directly

controlled by users, such as artificial intelligence” (Levine, ¶0186) and may include non-player characters of a nature similar to a “monster” such as “Dragon” or “Troll” (Levine, ¶0394). (Cooperstock, ¶106.)

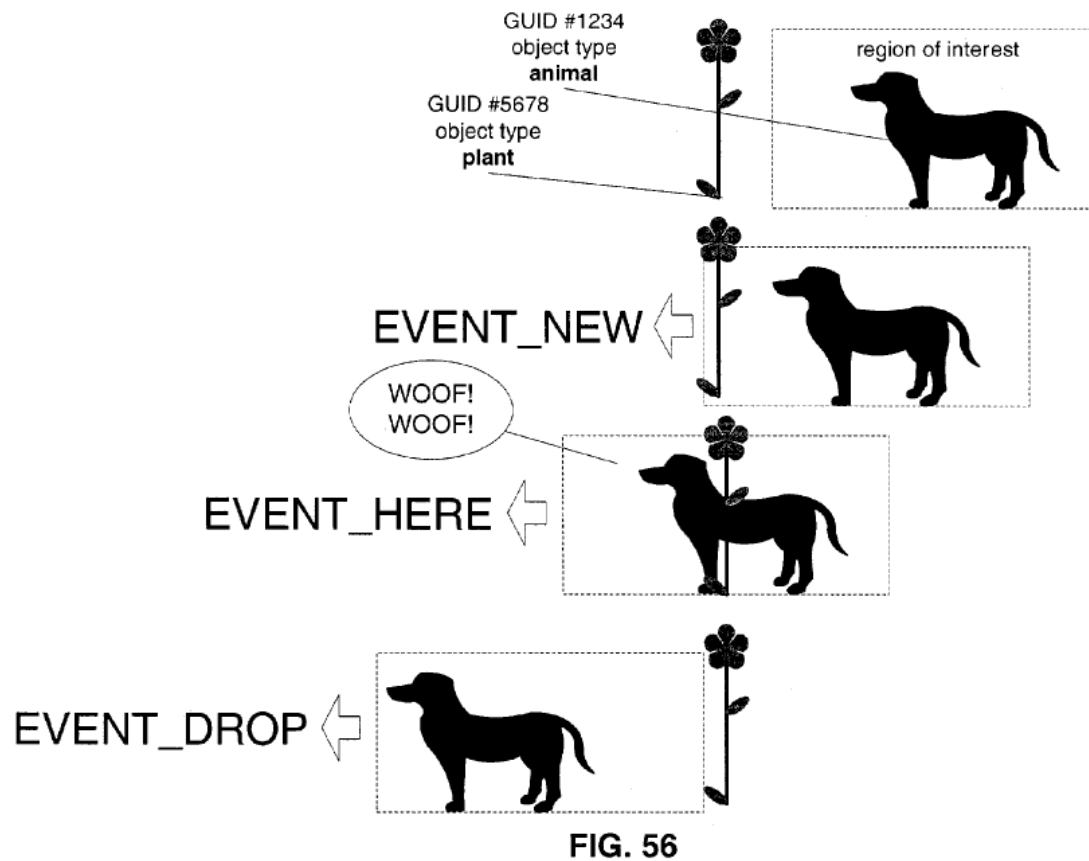
Levine also renders obvious that the “sniper” game would include NPC active objects controlled by artificial intelligence. (Cooperstock, ¶107.) Levine describes that the “sniper” game is associated with one or more “Locales” among which players can move around, and Levine describes that a given “Locale” may have NPCs associated with it. (*E.g.*, Levine, ¶¶0557 (“FIG. 46 shows a Game Server of Record 4601 that includes a Locale of Record 4602 with a sniper standing inside the Locale of Record 4602.”), 0562 (discussing “when a player moves from one Locale to another” in the sniper game), 0394 (describing “Active Objects (NPCs)” and “active objects within a specific Locale”), 0637 (discussing “NPCs within a given Locale”).) A person of ordinary skill in the art would have found it obvious to apply these teachings regarding Locales to embodiments of games that use Locales (Cooperstock, ¶107)—especially since “[c]ombining two embodiments disclosed adjacent to each other in a prior art patent does not require a leap of inventiveness.” *Boston Scientific*, 554 F.3d at 991. Levine thus renders obvious that one or more of the Locales encompassed within the “sniper” game would implement one or more NPCs controlled with artificial intelligence, as a matter of design choice to

implement Levine's teaching that Locales may have associated NPCs.
(Cooperstock, ¶107.)

A person of ordinary skill in the art would have further understood and found it obvious that each NPC ("**second video game character**") is "**operable to be displayed on said display.**" (Cooperstock, ¶108.) For example, Levine describes how NPCs can take the form of a "troll" or "dragon," and that NPCs can "walk and talk, or run and hide" and swing an axe. (Levine, ¶¶0394, 0629, 0633.) In the "monster" game illustration, "the 'monster' character" is created to have associated 3D and 2D visual representations: "(a) use graphics software such as 3D Studio Max or Maya to create a 3D visual representation of the 'monster' character; (b) use a JPEG file to create a 2D visual representation of the 'monster' character." (Levine, ¶0659.) The "monster" is displayed on the display of the mobile user's wireless telephone, client device **112a**. (Levine, ¶¶0663 ("Grid system **100** ensures that the 'monster' character is properly rendered for each user utilizing a different type of client device **112.**"), 0666 ("In step 5818, the synthetic representation of the 'monster' character would disappear from the PC user's, laptops user's and mobile user's client devices.").)

Similarly, consistent with Levine's description that NPCs "may be animals" (Levine, ¶0629), Levine shows a visual depiction of a character in the form of a dog,

an “active object” which just like a player’s avatar, has a “region of interest” and interacts with other objects:



(Levine, Fig. 56; Cooperstock, ¶109.)

Levine describes the “dog” activity as follows, illustrating how the dog is a character that has defined behavior, such as walking and barking:

As an example, consider a case of just one such primary object “dog” (of type animal) with the Globally Unique ID #1234 whose behavior is being determined by the Daemon Controller (see FIG. 56).

This Active object is walking along controlled by the daemon process. It comes within range of a secondary object “flower” with Globally Unique ID #5678 and type PLANT. As the dog approaches the flower,

it receives its first Daemon Event (of type NEW). Continuing to stroll, the dog brushes against the flower, and receives a series of Daemon Events (of type HERE) as long as it is in contact with that other object. In this case, the Daemon Controller initiates an object state change in the dog, causing it to bark every time a TICK event is synthetically generated eventually, the dog passes the flower and leaves it behind, and as the secondary object passes out of its region of interest it stops barking when it receives a final Daemon Event (of type DROP).

(Levine, ¶¶0651-0652.)

Given the form that NPCs can take and the actions and user interactions they can perform, and the illustration of the “monster” character being displayed on client devices including mobile phone 112a, it would have been apparent and obvious that other NPCs likewise would be **displayed** to a mobile user during game play. (Cooperstock, ¶111.) For example, a person of ordinary skill in the art would have understood and found it obvious that a visual representation of the dog, such as shown in Figure 56, would be displayed to players including the mobile user on mobile phone 112a. (*Id.*)

(g) **“said first location-based control signals are provided by said locating device,” (Claim 1[g])**

Levine discloses that **“said first location-based control signals are provided by said locating device.”** (Cooperstock, ¶¶112-113.)

As discussed for Claim 1[a], Levine discloses that the OAP device in the mobile user’s wireless telephone (**“said locating device”**) provides signals

indicating the location of the device. (Levine, e.g., ¶¶0155, 0162, 0196-0198.) As discussed for Claim 1[c], Levine discloses and renders obvious that these location-based control signals provided by the OAP device in the mobile user's mobile phone are operable to control the location-based character in the game. (Levine, e.g., ¶¶0196-0198, 0204, 0557, 0571 0670-0671, Fig. 3.)

(h) “wherein said locating device includes an accelerometer.” (Claim 1[h])

Levine discloses “**wherein said locating device includes an accelerometer.**” (Cooperstock, ¶114.) As discussed for Claim 1[a], Levine discloses the claimed “locating device” in the form of an OAP device, also referred to as an “Inertial Tracking Subsystem.” (Levine, ¶0198, Fig. 3.) Referring to Figure 3 (reproduced below), Levine further discloses that the OAP device includes “**accelerometer[s]**”:

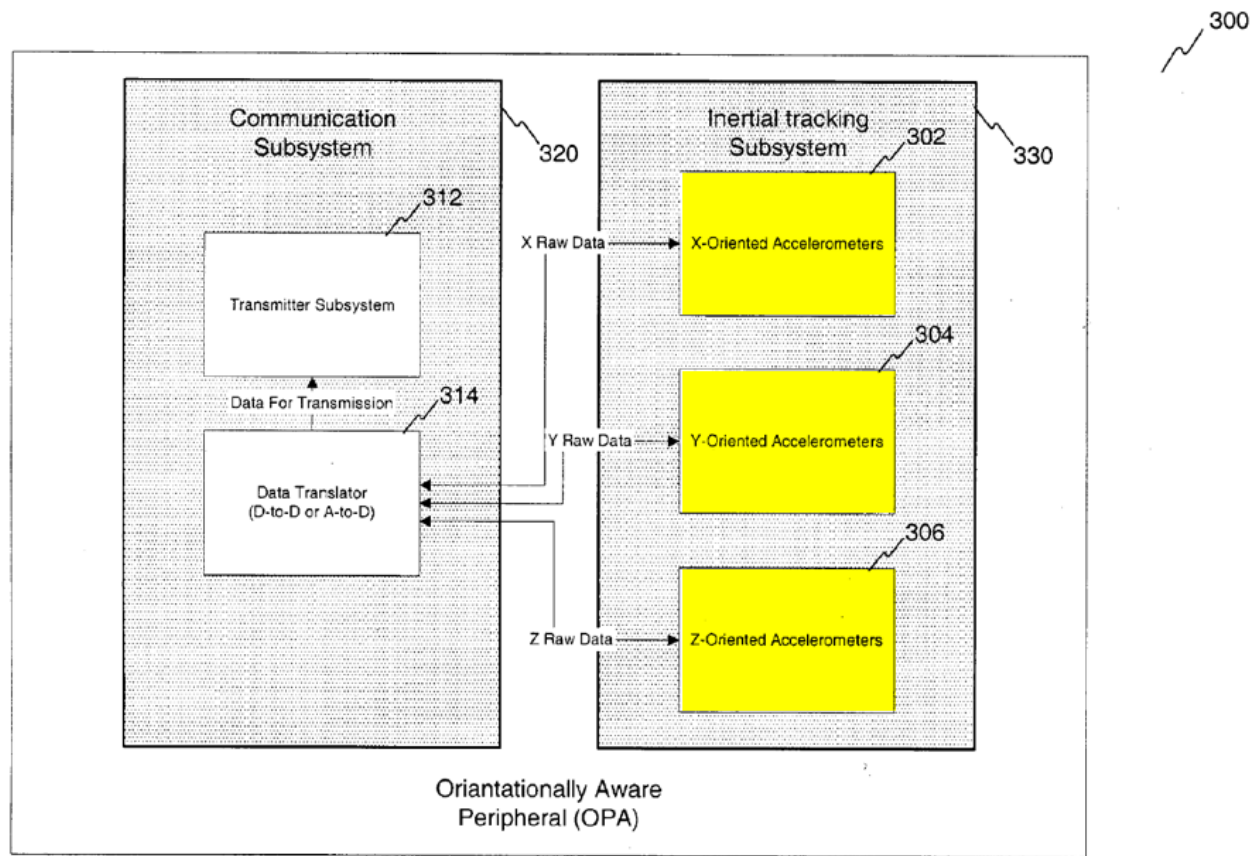


FIG. 3

Referring to FIG. 3, a block diagram representing the architecture of an orientationally-aware peripheral (OAP) device 300 according to an embodiment of the present invention is shown. OAP device 300 includes an inertial tracking subsystem 330 and a communication subsystem 320. Inertial tracking subsystem 330 employs six accelerometers that will track the placement and orientation of the peripheral device in six degrees of freedom (“6-DOF”). Such a design eliminates the need for separate gyroscopic sensors to determine orientation information. The six accelerometers are divided into three groups of two sensors each (i.e., accelerometers pairs 302, 304 and 306) oriented along each of three perpendicular axes. Each pair of accelerometers is separated as far as is possible on the platform. By

correctly integrating the acceleration of all six sensors, both position and angular orientation can easily be calculated.

(Levine, ¶0198, Fig. 3 (highlighting added).)

Levine thus discloses “**wherein said locating device includes an accelerometer.**”

2. Claim 2: “The system of claim 1, wherein further comprising [sic] a second locating device that includes a positioning device.”

Claim 2 appears to have a typographical error in that it recites “[t]he system of claim 1, wherein further comprising [sic] a second locating device that includes a positioning device.” Levine teaches multiple ways that its system comprises a second locating device that includes a positioning device. (Cooperstock, ¶¶117-118.)

First, as discussed for Claim 1[a], the disclosed OAP device contained in each client device **112** is a locating device that includes a positioning device. (Levine, ¶¶0197-0204.) Levine describes that the OAP device is a locating device used to determine location and that it also comprises a “positioning device” used to determine “position”: “By correctly integrating the acceleration of all six sensors, both position and angular orientation can easily be calculated.” (Levine, ¶0198.) Levine discloses that the system includes multiple client devices **112**, and each of them may include an OAP device. (Levine, ¶¶0187, 0194, 0197.) Thus, each

additional client device **112** in the system, beyond the “wireless telephone” of Claim 1, that contains an OAP device discloses a “**second**” locating device that includes a positioning device. (Cooperstock, ¶117.)

Second, Levine discloses that the system may include a Global Positioning System (GPS) system to geographically track user’s locations, disclosing and rendering obvious that the system includes GPS devices co-located with each user to track their locations. (Levine, ¶¶0162 (“Another feature of the present invention is that users’ locations can be geographically tracked, via a Global Positioning Satellite (GPS) system ...”), 0196 (“in addition to existing systems such as GPS and the like, inertial tracking can be used to track the location and orientation of players within system 100”).) As its name indicates, GPS is a “positioning” system and a GPS device incorporated into a user’s client device, such as a GPS receiver, discloses a “locating device” that includes a “positioning device.” (Cooperstock, ¶118.) This understanding matches the disclosure in the ’151 patent specification, which describes that a GPS device such as a GPS receiver in a client device is a “locating device” and a “positioning device.” (’151, Abstract (referencing “any device (e.g., a wireless telephone) that includes a locating device (e.g., a GPS system)”), 4:7-11 (discussing “locating devices” such as “a GPS device (or any type of locating device)”), 10:33-38 (discussing that wireless telephone may include “positioning

device such as a GPS or LPS (not shown),” 15:26-27 (discussing “locating devices 701 (e.g., a GPS receiver or an accelerometer)”); Cooperstock, ¶118.)

From Levine’s descriptions, a person of ordinary skill in the art would have understood and found it obvious that GPS devices would be included in the system, such as GPS devices contained in the multiple client devices **112** of players participating in the game. Each such GPS device in the multi-player system beyond the “locating device” of Claim 1 is a “**second**” locating device that includes a positioning device. (Cooperstock, ¶118.) (*See also* Levine, Abstract, ¶0003.)

3. Claim 3: “The system of claim 1, further comprising a directional device for determining direction.”

Levine discloses “[t]he system of claim 1, further comprising a directional device for determining direction.” (Cooperstock, ¶¶120-121.)

The ’151 patent describes that an accelerometer may be utilized as a locating device, and further describes that a location device may be used to determine the “direction” in which a device is pointing. (’151, 7:15-17 (“devices that measure movement (e.g., an accelerometer) may be utilized as a locating device”), 14:55-61 (“Additional locating data may be utilized. For example, the direction that a visor, or a gaming device with a game display, is pointing in may be determined by any number of location devices. For example, four location devices may be provided to determine not only the direction that visor **632** is pointing but also the pitch at which visor **632** is pointed in.”); Cooperstock, ¶120.)

Petition for *Inter Partes* Review of
U.S. Patent No. 10,974,151 B2

Consistent with the '151 patent and the knowledge of a person of skill in the art, Levine discloses that the OAP device that may be contained in each client device in Levine's system includes accelerometers to provide both position and orientation—i.e., the direction in which the device is facing. (Levine, ¶0237 (“Orientation—which way this object is pointed in the game world”); Cooperstock, ¶120.) Levine's disclosure of OAP devices was discussed for Claim 1[a], which is incorporated by reference here. (*E.g.*, Levine, ¶¶0155, 0196-0198 (OAP “employs six accelerometers that will track the placement and orientation of the peripheral device in six degrees of freedom,” and “both position and angular orientation can easily be calculated”).) Levine's OAP device included in client devices in Levine's game system thus discloses a “**directional device for determining direction.**”

VII. CONCLUSION

Petitioner respectfully requests IPR institution.

Dated: April 5, 2025

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this petition complies with the type-volume limits of 37 C.F.R. § 42.24(a)(1)(i) because it contains 11,133 words, according to the word-processing system used to prepare this petition, excluding the parts of this petition that are exempted by 37 C.F.R. § 42.24(a) (including the table of contents, a table of authorities, mandatory notices, a certificate of service or this certificate word count, appendix of exhibits, and claim listings).

DATED: April 5, 2025

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CERTIFICATE OF SERVICE

I hereby certify, pursuant to 37 C.F.R. Sections 42.6 and 42.105, that a complete copy of the attached **PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 10,974,151 B2**, including all exhibits (**Nos. 1001-1006**) and related documents, are being served via Federal Express on the 5th day of April, 2025, the same day as the filing of the above-identified document in the United States Patent and Trademark Office/Patent Trial and Appeal Board, upon Patent Owner by serving the correspondence address of record with the USPTO as follows:

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UNITED STATES

And, via Federal Express upon counsel of record for Patent Owner in the litigation pending before the U.S. District Court for the Western District of Texas entitled *Mullen Industries LLC v. Meta Platforms, Inc.*, Case No. 1:24-cv-00354-DAE (W.D. Tex.) as follows:

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