

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,
Petitioner,

v.

MULLEN INDUSTRIES LLC,
Patent Owner.

Case No. IPR2025-00702
U.S. Patent No. 10,967,270

PATENT OWNER'S PRELIMINARY RESPONSE

TABLE OF CONTENTS**Page**

I.	Introduction.....	1
II.	Technology Primer And Prior Art Problem	3
III.	The Challenged Patent.....	6
IV.	The Petition.....	12
A.	Cheok.....	12
B.	Foxlin077	13
V.	Board Should Deny Institution Because The Petition Does Not Establish The Required Reasonable Likelihood Of Success.....	18
A.	All Grounds And Prior Art Combinations Fail To Disclose Or Render Obvious “A First Manual Input For Setting A Origin Location Setting For A Location Reference For Gameplay,” Which Is Required By All Challenged Claims.....	18
1.	Ground 1: Cheok In View Of Nakamura Fails To Disclose Or Render Obvious “A First Manual Input For Setting A Origin Location Setting For A Location Reference For Gameplay” (Claim 4).....	23
2.	Ground 2: Nakamura Fails To Disclose Or Render Obvious “A First Manual Input For Setting A Origin Location Setting For A Location Reference For Gameplay”	29
B.	All Grounds And Prior Art Combinations Fail To Disclose Or Render Obvious “A Graphical User Interface Is Provided On Said Display To Receive . . . A Second Manual Input For Setting A Directional Reference For A Direction Of Gameplay For A Virtual Character Of A Location- Based Game Provided On Said Device Based On The Direction Of Said Device And Said Location-Based Game Is Provided On Said Device With Respect To Said Directional Reference And Said Directional Reference Is Operable To Be Updated During Said Gameplay,” Which Is Required By All Challenged Claims.....	29
1.	Ground 1: Cheok In View Of Foxlin077 Does Not Render Obvious Limitation 4[a.2]	32

2. Ground 2: Nakamura In View Of Benini Does Not Render Obvious
Limitation 4[a.2] 41

VI. Conclusion 51

TABLE OF AUTHORITIES

	Page(s)
Statutes	
35 U.S.C. § 314(a)	1

Mullen Industries LLC (“Patent Owner” or “Mullen”) submits this Preliminary Response to the Petition for *Inter Partes* Review (“Petition”) of U.S. Patent No. 10,967,270 (“the ’270 Patent”) filed by Meta Platforms, Inc. (“Petitioner”).

I. Introduction

The ’270 patent improves upon prior-art virtual reality (“VR”) systems which inhibited natural movement by a user and/or presented safety risks. Prior systems either confined a user to a small platform with safety rails or presented risks that a user might unintentionally run into objects while playing a game due to obscured vision. In contrast, the ’270 patent provides a system which provides a location-based game that allows for natural body movement without relying on a joystick, while still ensuring that a user is in a safe area suitable for gameplay. The ’270 patent’s solution is made possible, in part, due to the patent’s teachings of (1) manually setting a physical origin location, which is used as a reference location for gameplay, and (2) manually setting a directional reference for a direction of gameplay. These references are used by the claimed system to translate a user’s physical movements on a physical playfield to a corresponding virtual playfield in a safe and user-controlled way.

The Board should deny institution under 35 U.S.C. § 314(a) because none of the Petition’s Grounds 1-3 establishes the required reasonable likelihood of success.

Grounds 1 and 2 are the only grounds relied on for claim 4, the sole challenged independent claim. Ground 3 only adds an additional reference to the Ground 2 combination to attempt to address dependent claims, but it does not modify the independent claim allegations.

First, all grounds fail to disclose or render obvious that a graphical user interface (“GUI”) receives “a first manual input for setting a origin location setting for a location reference for gameplay,” as required by claim 4 and thus by challenged claims. Both Grounds 1 and 2 rely on the Nakamura reference for “a first manual input” for setting an origin location setting. But Nakamura at best only discloses a manual input for setting an initial virtual icon position, whereas the claimed origin location setting must be a physical location. Further, Nakamura’s virtual position is not used as a location reference for gameplay, as required by claim 4.

Second, all grounds fail to teach or suggest that a GUI that receives “a second manual input for setting a directional reference for a direction of gameplay for a virtual character of a location-based game provided on said device based on the direction of said device,” which is also required by claim 4. Ground 1 points to Foxlin077, which is not about gameplay and wherein a user merely establishes a baseline rest position of a sensor. The Petition also lacks any allegation, much less proof, that a user holding a sensor in a known rest position would constitute a *graphical user interface* receiving a user’s manual input. Ground 2 relies on Benini,

a reference about viewing historic sites, which, among other weaknesses, is not about games or gameplay. Further, the Petition relies on Benini's use of buttons to navigate a historic site, which does not establish a manual input for setting a directional reference "based on the direction of said device," as claimed. The direction of the device in Benini is irrelevant; the user's button presses are the only relevant input.

Third, as explained below, there is no motivation to combine any of the references in the Petition, which attempts to stitch together different references by proposing illogical modifications that lack any benefit and indeed have significant drawbacks.

For these reasons, and those further discussed below, the Petition should be denied.

II. Technology Primer And Prior Art Problem

The challenged claims generally relate to virtual-reality video game systems. More specifically, the patent is directed to 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." Ex. 1001, 2:28-31. Virtual reality is a computer-generated environment which can be explored and interacted with by a user. Virtual reality has a wide variety of applications, including immersive video games.

The '270 patent identifies several problems with prior-art VR systems. The patent explains that “[v]irtual reality games have been developed where a user places a helmet on his/her head and is immersed into an alternate reality via a display located on the helmet.” Ex. 1001, 1:24-26. “This user is then allowed to move through an alternate reality by means of a joystick.” *Id.*, 1:26-28. However, “[a] user is limited in actual physical movement by means of a very small (e.g., 48 inches) enclosed virtual reality platform.” *Id.*, 1:29-31. Thus, these “traditional virtual reality systems are deficient because of the need for additional, unneeded manual actions to be made to move a joystick in order to move the user through the alternate reality.” *Id.*, 1:31-35. “It is therefore desirable to provide a game system with improved user controls.” *Id.*, 1:35-36.

Additionally, “[t]raditional virtual reality systems are also unsafe because a user cannot visually see his/her physical environment.” *Id.*, 1:37-38. As alluded to in the '270 patent, the prior-art solution to this safety problem was to provide a small virtual reality platform with guard rails. *Id.*, 1:39-40. An example of such a solution is depicted below:



However, even in such a system, “a user may become distorted in the alternate reality and lose a sense of direction as to where such rails are located,” which could cause the user to “dangerously contact such guard rails or foreign objects introduced onto a virtual reality platform.” *Id.*, 1:40-44. “It is therefore desirable to provide safer game systems.” *Id.*, 1:44-45.

Thus, the '270 patent identifies that prior-art VR systems presented both a problem—dangerous, unbounded gameplay whereby a user could come into contact with objects while playing—and an insufficient solution—highly physically-constrained gameplay using physical safety rails that could still be collided with, and

leading to unnatural movement requiring a joystick to move a character in a game.

The '270 patent proposes a better solution.

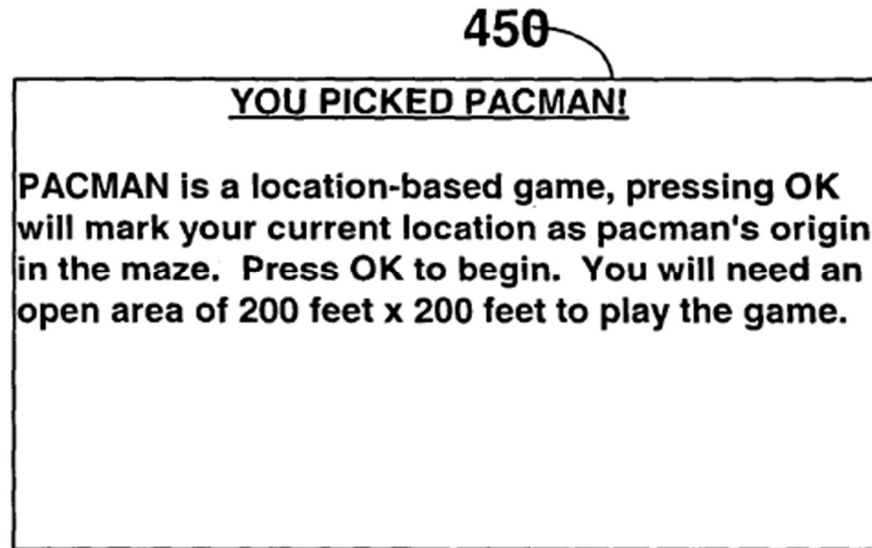
III. The Challenged Patent

The '270 patent solved the aforementioned problems with the prior art, allowing for more natural movement in a safe environment. The patent's claims describe systems for providing location-based video games employing a reference origin location and reference direction, allowing the user's natural movement on a physical playfield to be reflected in a virtual playfield. The claimed systems allow for manually setting, using a graphical user interface ("GUI"), an "origin location setting for a location reference for gameplay" and a "directional reference for a direction of gameplay." Ex. 1001, claim 4. By utilizing such reference information, the systems enable a user to control a virtual character on a video game's virtual playfield by moving around the physical playfield. Ex. 1001, 6:15-23, 16:2-8. Accordingly, the claimed invention obviated the need for a handheld control device, such as a joystick, to control movement about a playfield in a game.

Critically, the '270 patent provided a system in which a user has direct control over the location in which he or she will start the game in the physical world (the "origin location") and/or in what direction he or she will be playing (the "direction of gameplay"). For example, "a GUI may be provided that prompts a user on how

much free physical space is need on all sides of the origin for gameplay.” *Id.*, 6:18-

20. Screen 450 of Figure 4 illustrates such a GUI:



Id., Fig. 4 (partial). By ensuring that the user is in a location with sufficient space to play the game, the claimed invention solves the problem of risky deviation during gameplay, which could lead to a user tripping or bumping into a physical object, while also not confining players to a small platform with safety rails, which would impede natural movement.

Moreover, a physical origin location is also used as a “reference location during gameplay.” *Id.*, 9:25-31. The origin is used as a reference to measure a user’s movements from the origin: “the difference in two locations provided by a locating device (e.g., the magnitude and direction of a location to an origin) may be utilized to move a character in a video game playfield (or provide other control signals to the

video game system).” *Id.*, 7:10-14; *see also id.*, 21:6-22. In addition, “[m]ultiple features may be provided as the result of including... one or more reference/origin values,” including a “multiplayer feature where the players may be located on different physical playfields.” *Id.*, 9:31-35.

The establishment of an origin location allows for the creation of a corresponding virtual playfield. *Id.*, 20:17-19 (“[A]n origin is a location reference that the gaming system utilizes to map a virtual playfield to a physical playfield.”). For example, “[a] grid may be included... on display 1030 that is associated to different location areas that a user may travel in.” *Id.*, 17:56-58 (describing Fig. 10). “Character 1091 may be included to represent the grid location on the virtual playfield that the user’s actual location on a physical playfield corresponds too.” *Id.*, 17:58-60.

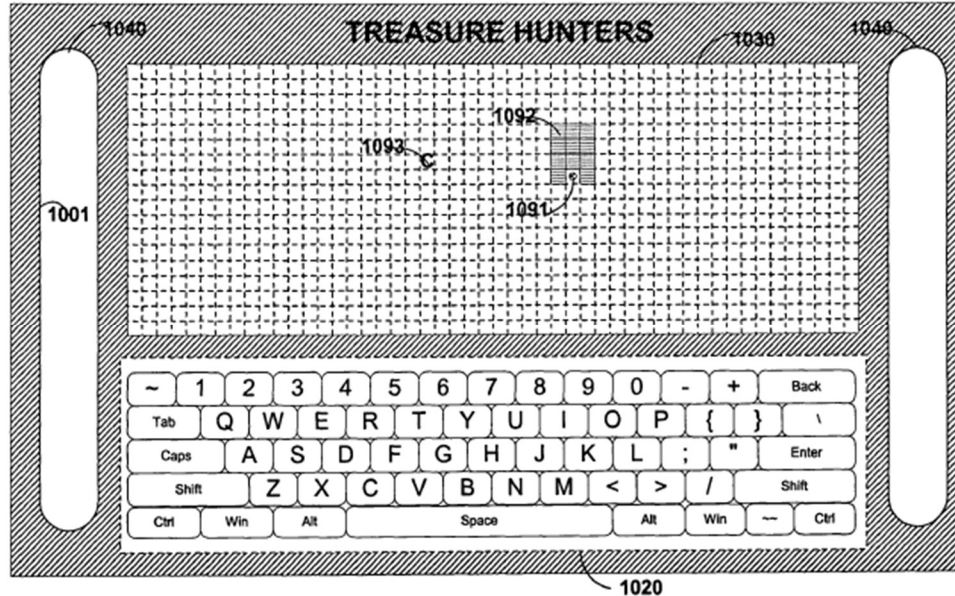


FIG. 10

Id., Fig. 10. The '270 patent utilizes the dimension information to translate and scale a physical playfield to a virtual playfield. *Id.*, 6:49-51. This in turn enables the system to provide a wider variety of games, including multiplayer games between users in different physical locations. *Id.*, 6:49-7:5. For example, “a child in his/her backyard in the U.S. may play a game of virtual PACMAN with his/her father that is located in a park in Japan.” *Id.*, 3:22-24. The claimed invention may also utilize an origin location to provide games that are larger than the physical playfield:

Since such a game may be larger than an actual playfield (e.g., a soccer field), *an origin may be manually reset at any time where the origin may be representative of a mid-game starting position.* For example, *if a user reaches the end of his/her physical playfield at the position of the*

grid that character 1091 resides then the user may reset that location to the origin, turn around, and set that direction and the reference direction.

Id., 18:21-28 (emphasis added).

In addition to setting an origin location, the GUI can receive a manual input to establish a reference direction, increasing user control, as alluded in the above quote. *Id.* The reference direction can establish a “direction for gameplay” for the game:

In FROGGER, for example, the origin may be near the boundary of the virtual playfield. Accordingly, the user may be prompted to select a direction for gameplay. Such a direction may be determined by the device prompting the user to point the device in a particular direction (where the direction the device is pointed in may be displayed to the user) and recording this direction. The origin and/or the direction the user is pointing in may be utilized to calibrate the system 700. Such directional information may also be utilized to calibrate an opponent’s gaming system, or signals sent to an opponent’s gaming system representative of a user’s location on a virtual playfield.

Id., 15:67-16:13. Thus, the directional reference can be used to establish which physical direction on a physical playfield corresponds to which virtual direction on a virtual playfield:

For example, if a user reaches the end of his/her physical playfield at the position of the grid that character 1091 resides then the user may reset that location to the origin, turn around, and set that direction and the reference direction. Before this occurred, if the user walked backward, that user may have moved into a grid position down-from the location of character 1091. Now, the user may walk in that same direction, but may move forward into the grid location above character 1091.

Id., 18:24-32.

The challenged claims of the '270 patent capture the above-described features.

Independent claim 4 recites:

4. A system comprising:
a device having a display, wherein a graphical user interface is provided on said display to receive a *first manual input for setting a origin location setting for a location reference for gameplay* and a *second manual input for setting a directional reference for a direction of gameplay* for a virtual character of a location-based game *provided on said device based on the direction of said device* and said location-based game is provided on said device *with respect to said directional reference and said directional reference is operable to be updated during said gameplay.*

(emphasis added).

IV. The Petition

The Petition asserts two grounds, Grounds 1 and 2, against independent claim 4:

Ground	Claims	Statute	Prior Art ²
1	4, 5, 16, 17, 19	pre-AIA 35 U.S.C. § 103	Cheok (EX1006), Nakamura (EX1007), Foxlin077 (EX1008)
2	4, 5, 17		Nakamura, Benini (EX1009)
3	16 and 19		Nakamura, Benini, Foxlin068 (EX1010)

Pet., 1. This preliminary response explains why Grounds 1 and 2 each fail below. Ground 3 merely adds a reference (Foxlin068) to the combination of Ground 2 in order to attempt to address dependent claims 16 and 19, which depend from claim 4. Ground 3 does not change the Ground 2 analysis regarding claim 4, the only independent claim, and thus Ground 3 fails for the same reasons Ground 2 does, explained below, for failure to render obvious independent claim 4. Pet., 76-82. Thus, all grounds fail.

A. Cheok

Cheok describes “Human Pacman,” “an interactive ubiquitous and mobile entertainment system that is built upon position and perspective sensing via Global Positioning System and inertia sensors; and tangible human-computer interfacing with the use of Bluetooth and capacitive sensors.” Ex. 1006, Abstract. A wearable computer employs sensors to track players’ locations and head positions. This

information is then used to “superimpose[] a 3-D virtual cookie image of a proportionate size on corresponding position on the video stream” and “update the 2-D virtual map in the HMD view of the player.” *Id.*, 108-109. The wearable computers are also in communication with a centralized server, which “maintains up-to-the-minute players’ information (location, status etc.), and presides over any communication between Bluetooth objects and the wearable computers.” *Id.*, 109-110.

Notably, Cheek lacks any disclosure regarding manual inputs for setting an origin location or a directional reference, as the Petition concedes, relying on Nakamura and Foxlin077, respectively for those elements. Pet., 35-36, 42-43.

B. Foxlin077

Foxlin077 provides “an inertial angular orientation tracking apparatus.” Ex. 1008, 6:20-22. Specifically, the device is “a self contained sensor apparatus for generating a signal that corresponds to at least two of the three orientational aspects of yaw, pitch, and roll of a human-scale body, relative to an external reference frame.” Ex. 1008, 3:54-58. “The invention does not produce position information, only angular orientation information.” *Id.*, 6:22-23. One disclosed embodiment of the sensor is a head-mounted orientation sensor, as shown below:

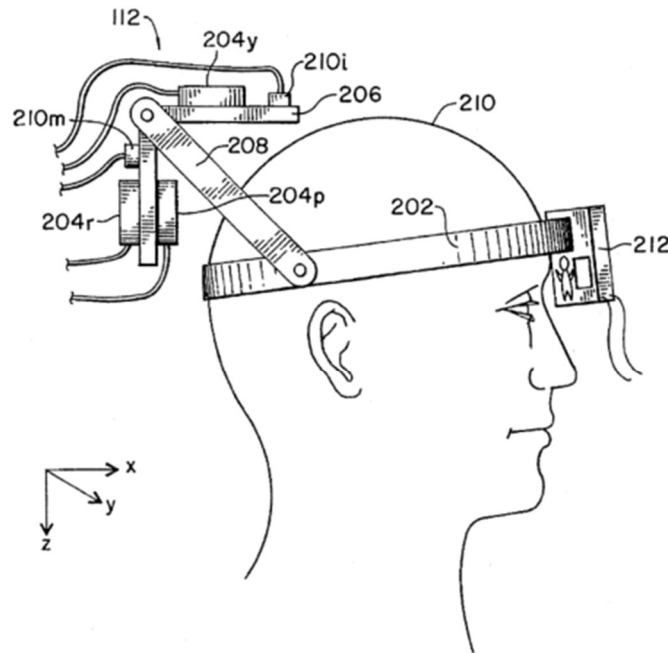


FIG. 2A

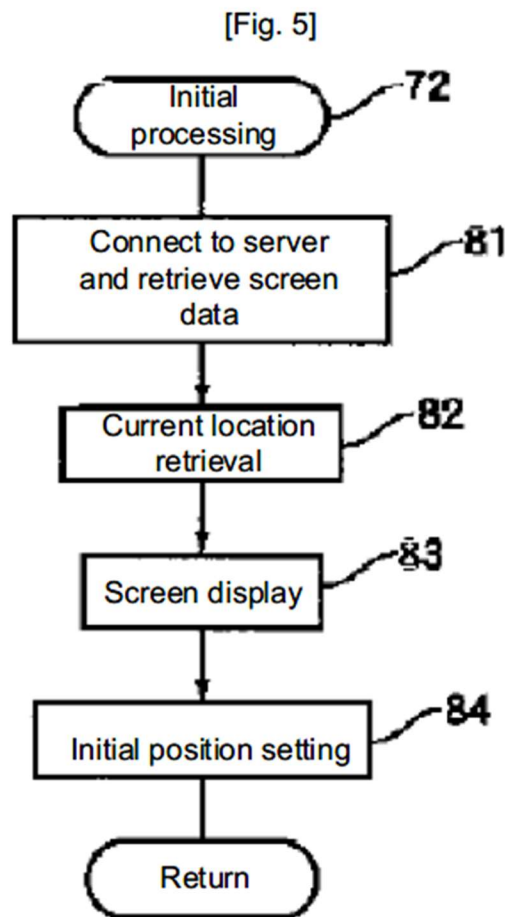
Ex. 1008, Fig. 2A.

Foxlin077 discusses “initialization steps,” which “establish the rest position” of the sensor for future measurements. *Id.*, 9:65-10:2. Notably, despite reliance by the Petition on Foxlin077, Foxlin077 fails to disclose or render obvious the claimed ability for the system to receive a manual input to establish a directional reference for a direction of gameplay, as (1) the reference has nothing to do with gameplay, (2) the initialization steps the Petition points to merely set a “baseline” orientation to provide more accurate physical measurements, rather than a direction of gameplay, and (3) the baseline orientation is not set by manual input. Moreover, Foxlin077 fails to teach or suggest a GUI for receiving such a manual input.

C. Nakamura

Nakamura relates to “a system for controlling a computer based on location information.” Ex. 1038, ¶ [0001]. More specifically, Nakamura describes a system for providing a role-playing video game that “allows the user to control [a] virtual world [by] physically moving their actual location.” *Id.*, ¶ [0006].

Nakamura’s Figure 5 is a flowchart illustrating four “initial processing” steps:



Ex. 1038, ¶ [0032], Fig. 5. When a new game is initialized, “the current location is obtained using the location acquisition function 11.” *Id.*, ¶ [0034]. At step 84, a

“position icon 113... can be arranged according to the user’s preference,” thereby allowing a user to select an initial virtual position within the virtual world. *Id.*, ¶ [0035]. But, unlike in the ’270 patent claims, the moving of the virtual icon does not move the “origin location setting”, which is the user’s initial location in the physical world, as explained above in Section III. Moreover, Nakamura lacks any disclosure that its initial virtual position is a location reference.

Nakamura further discloses an optional feature in which the display of the virtual world is automatically rotated such that the direction that a virtual character is moving in will always point upwards on a screen. *Id.*, ¶ [0024]. But, unlike in the ’270 patent claims, the rotation of the screen does not set a directional reference for a direction of gameplay, because it does not affect how physical directions are translated into the virtual world or anything else about the direction of gameplay.

D. Benini

Benini “aims at exploring the potential of using portable devices in managing interaction in (semi)Immersive Virtual Reality (IVR) systems reconstructing cultural heritage objects and environments.” Ex. 1009, Abstract. Benini discloses a user interface featuring “a two-dimensional map abstraction of the VR world, augmented with various navigation controls.” *Id.*, 3, Fig. 2. As shown below, Benini’s system displayed a 2D map of a virtual world on a PDA and included arrow buttons for navigating through the virtual world.

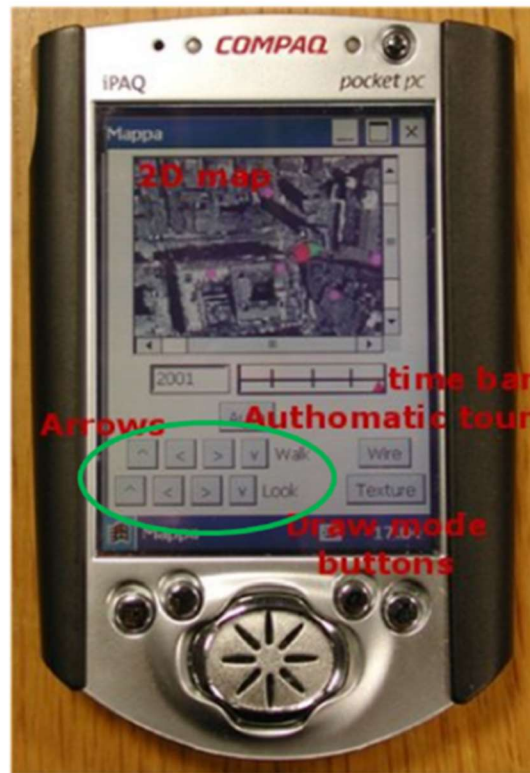


Figure 2: The User Interface developed for interacting via PDA with the Nu.M.E. VE

Pet., 68 (showing annotated Ex. 1009, Fig. 2). As shown, the arrow buttons are labeled “Walk” and “Look.” According to the Petition, the “arrows can be used to ‘change [the] camera’s position and orientation (interacting with the 2D map or with the arrows),’ thereby changing the view in the environment.” Pet., 68. However, Benini does not disclose—nor does the Petition address—that changing the view of a virtual environment sets a directional reference for a direction of gameplay.

Notably, Benini does not disclose a video game; rather, its purpose is to “reconstruct[] cultural heritage objects and environments” and allow users to view

virtual heritage sites. Ex. 1009, Abstract. Thus, Benini does not teach or suggest a “direction of *gameplay* for a virtual character of a location-based *game*.”

V. Board Should Deny Institution Because The Petition Does Not Establish The Required Reasonable Likelihood Of Success

The Petition should be denied because Grounds 1-3 all fail to establish the required reasonable likelihood of success.

A. All Grounds And Prior Art Combinations Fail To Disclose Or Render Obvious “A First Manual Input For Setting A Origin Location Setting For A Location Reference For Gameplay,” Which Is Required By All Challenged Claims

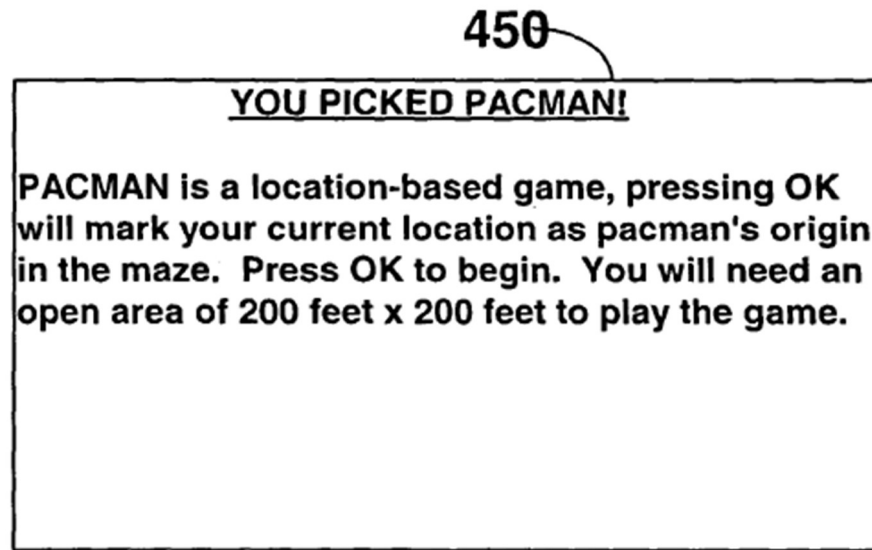
Claim 4, the lone challenged independent claim, recites “a graphical user interface is provided... to receive a first manual input for setting a origin location setting for a location reference for gameplay.” Ex. 1001, element 4[a.1]; Pet., 1. The challenged dependent claims (claims 5, 16, 17, and 19) all depend from independent claim 4. Ex. 1001, claims 5, 16, 17, and 19. Thus, all challenged claims require a “a first manual input for setting a origin location setting for a location reference for gameplay.”

In Ground 1, the Petition argues that Cheok in view of Nakamura renders obvious limitation 4[a.1]. Pet., 35.

In Ground 2, the Petition exclusively relies on Nakamura, without modification, for limitation 4[a.1]. Pet., 62.

However, neither Cheok nor Nakamura (either individually or in combination with one another) teaches or suggests at least “a first manual input for setting a origin location setting for a location reference for gameplay.” Thus, all grounds fail to disclose or render obvious limitation 4[a.1], and thus all grounds fail and institution should be denied. The ’270 patent specification consistently describes an “origin” as a physical location. *See, e.g., supra* Section III; Ex. 1001, 6:15-23, 6:63-66, 7:10-15, 8:66-8:3, 9:25-45, 15:23-35, 18:21-28, 21:6-22, Fig. 4. In particular, the specification explicitly states that the “manual origin setting” refers to a user selecting a physical location (as opposed to a virtual location). *Id.*, 8:66-9:3.

In order to set the origin location setting, “a GUI may be provided that prompts a user on how much free physical space is needed on all sides of the origin for gameplay.” *Id.*, 6:15-20. This “allow[s] a user to locate a proper spot on an actual, physical playfield before gameplay begins.” *Id.*, 20-23. Screen 450 of Figure 4 illustrates such a GUI:



Id., Fig. 4 (partial). In response to such a prompt, the user “select[s] a physical location as the start of a game,” such as by “position[ing] the device at a desired origin.” *Id.*, 8:66-9:3. “Once a user selects a location for the origin of gameplay the device may record... the location of the selected origin (e.g., by obtaining the location from a locating device) and use this location as a reference location during gameplay.” *Id.*, 9:26-31.

Moreover, as recited in claim 4, the origin location is used as a “location reference.” *Id.*, 20:17-19 (“Generally, an origin is a location reference that the gaming system utilizes to map a virtual playfield to a physical playfield.”). “[T]he difference in two locations provided by a locating device (e.g., the magnitude and direction of a location to an origin) may be utilized to move a character in a video game playfield.” *Id.*, 7:10-15. Examples of “locating devices” in the specification

include a Global Position System (GPS) or Local Positioning System (LPS), which are both devices that detect a physical location. *Id.*, 7:6-10.

Moreover, as recited in claim 4, the origin location is used as a “location reference.” *Id.*, 20:17-19 (“Generally, an origin is a location reference that the gaming system utilizes to map a virtual playfield to a physical playfield.”). The origin location is used by the system’s location sensors to control a virtual character’s movement within the virtual world. *Id.*, 7:10-15 (“[T]he difference in two locations provided by a locating device (e.g., the magnitude and direction of a location to an origin) may be utilized to move a character in a video game playfield (or provide other control signals to the video game system).”). Examples of “locating devices” in the specification include a Global Position System (GPS) or Local Positioning System (LPS), which are both devices that detect a physical location. *Id.*, 7:6-10.

Thus, the ’270 patent is clear that setting a origin location setting means setting an initial physical location. The specification describes a GUI prompting a user to select an initial physical location, which is recorded using a locating device. *Id.*, 6:15-20; *see also id.*, 9:1-3 (“Step 207 may then wait for a user to submit the origin (e.g., for a user to ***select a physical location as the start of a game.***”); Fig. 4 (“pressing OK will mark ***your current location as pacman’s origin*** in the maze”); This initial physical location is then used as a reference location to measure a user’s

physical movement on a physical playfield, which is then used to move a virtual character on a corresponding virtual playfield. *Id.*, 7:10-15. Thus, a virtual character's virtual position on a virtual playfield is determined based in part on the physical origin. *Id.*; *see also id.*, 12:34-40. Accordingly, it would not make sense for the "origin location setting" to be a virtual location; a virtual location can't be used as a reference because the virtual location is determined by a user's physical location, not the other way around. *Id.*, 12:34-36 ("[T]he player's actual location may be translated into a virtual location for virtual character 576.").

Importantly, establishing an origin physical location enables the system to "use this location as a reference location during gameplay." *Id.*, 9:25-31. "Multiple features may be provided as the result of including... one or more reference/origin values," including "a multiplayer feature where the players may be located on different physical playfields." *Id.*, 9:31-35. Establishing a physical origin also ensures that a user is in a physical location that is suitable to begin the game. *See id.*, Fig. 4 (GUI notifies the user that "[y]ou will need an open area of 200 feet x 200 feet to play the game").

1. Ground 1: Cheok In View Of Nakamura Fails To Disclose Or Render Obvious “A First Manual Input For Setting A Origin Location Setting For A Location Reference For Gameplay” (Claim 4)

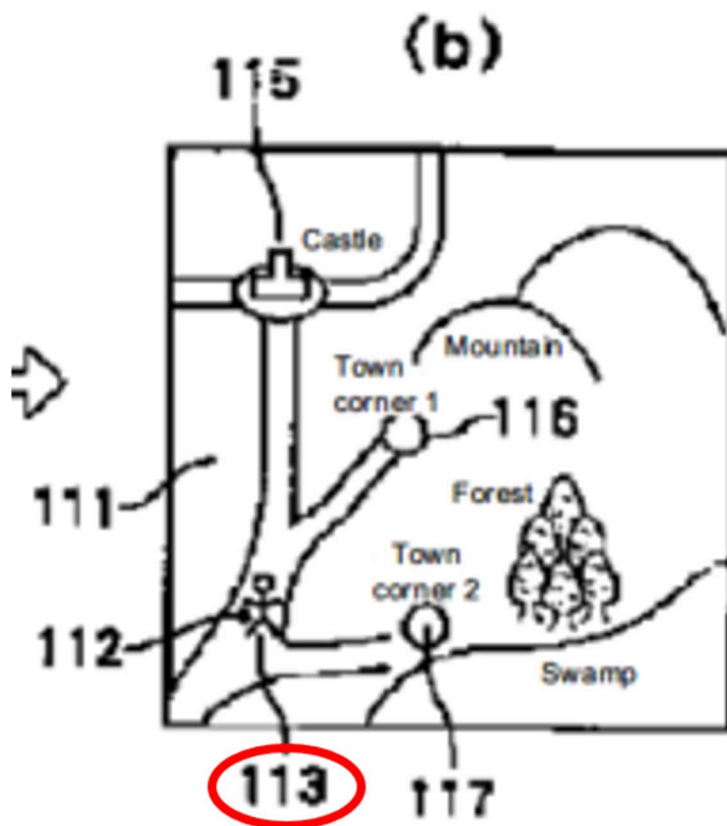
a. The Petition Concedes That Cheok Fails To Disclose “A First Manual Input For Setting A Origin Location Setting For A Location Reference For Gameplay”

In Ground 1, the Petition argues that “Cheok discloses a[n] origin location setting for a location reference for gameplay” but concedes that Cheok lacks “a first manual input” for setting such an origin location setting. Pet., 35-36. The Petition relies on combination with Nakamura for the missing limitation. But Nakamura fails to disclose or render obvious a manual input for setting an origin location setting for a location reference for gameplay, and there is no motivation to combine Cheok and Nakamura. Thus, Ground 1 fails.

b. Nakamura Fails To Disclose Or Render Obvious “A First Manual Input For Setting A Origin Location Setting For A Location Reference For Gameplay”

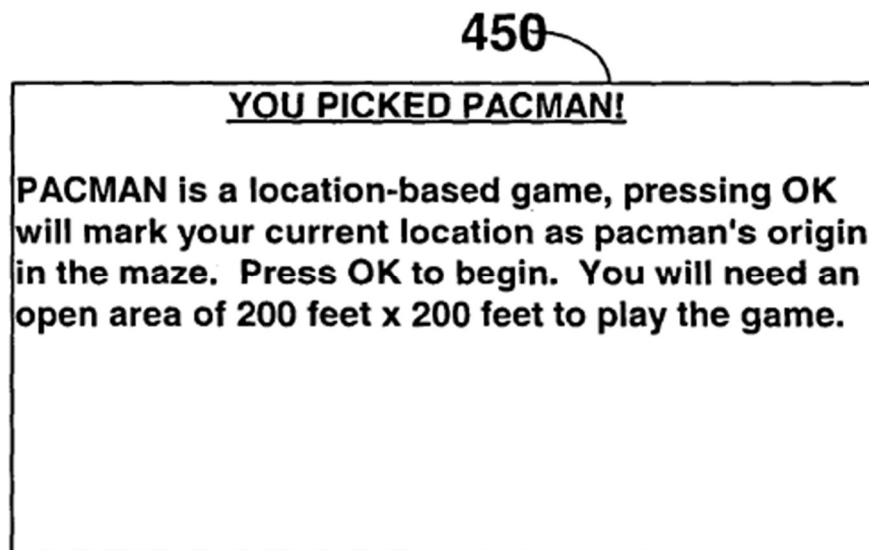
The Petition relies on Nakamura to remedy the deficiencies in Cheok. Pet. 39-40. The Petition points to Nakamura’s disclosure of a user having the ability to move “position icon 113” as a “manual input for setting an origin location setting.” Pet., 39-40 (citing that “position icon 113, or position display icon, can be arranged according to the user’s preference”) (citing Ex. 1007, ¶¶ [0035]-[0036]). The Petition’s analysis is incorrect for at least two reasons.

First, unlike the '270 patent's physical "origin of gameplay," Nakamura's position icon 113 represents a virtual character's *virtual location* in the virtual world, rather than a user's physical location, and has no relationship to the physical location; it can be moved freely in the virtual world. See Ex. 1038 ¶ [0036] ("the position icon 113 is displayed at a virtual position that is appropriate to be set as the initial position"), ¶ [0038]. The reference even alternatively refers to the position icon as "virtual position 113." *Id.* As shown below, Nakamura's Figure 9(b) shows position icon 113 on a map of the virtual world:



Ex. 1038, Fig. 9(b); *see also id.*, ¶ [0035] (“[A]s shown in Figure 9(b), the function 31 for displaying the virtual world displays the first screen (the first virtual world) 111 of the role-playing game.”).

As explained above, establishing a physical origin location as a location reference is critical to key features of the patented system. *Supra* Section III. The ’270 patent’s system “prompt[s] a user to position the device at a desired origin” and “wait[s] for a user to submit the origin (e.g., for a user to select a physical location as the start of a game).” Ex. 1001, 8:66-9:3. “[A] GUI may be provided that prompts a user on how much free physical space is needed on all sides of the origin for gameplay.” *Id.*, 6:18-20. Screen 450 of Figure 4 illustrates such a GUI:



Id., Fig. 4 (partial). By contrast, Nakamura’s initial virtual location setting can do none of that. Because Nakamura only discloses setting a virtual character’s virtual

position, it may start a game even if a user is in an unsuitable physical location (e.g., a small room for a game that requires a 200 foot playfield). Thus, at most, Nakamura's description of moving the position icon 113 discloses establishing an initial *virtual* location, not setting an origin location setting for a location reference for gameplay. Accordingly, a POSITA would not have understood Nakamura as disclosing "a first manual input for setting a origin location setting," as recited in claim 4.

Second, even if Nakamura's process for moving a position icon was interpreted as setting an "origin location," Nakamura still does not disclose that the origin location setting is "for a location reference for gameplay." Because virtual-world representations simply track the physical world, an initialization point in the virtual world is not a reference for anything. Movement is only measured with respect to a reference in the physical world, and there is no manual input related to any such physical reference in Nakamura, nor does the Petition allege there is. Nakamura does not teach or suggest that the position icon's initial virtual position is used as a location reference.

c. There Is No Motivation To Combine Cheok And Nakamura

Moreover, contrary to Petitioner's arguments, a POSITA would not have been "motivated to rely on Nakamura's initialization features to implement Cheok's

Human Pacman system.” Pet., 40. The Petition argues that because Cheok discloses a system that tracks user movement and discusses measuring such user movement from “an initialization point,” it would benefit from incorporating Nakamura’s alleged manual origin location setting. *Id.* That is wrong for at least two reasons.

First, the Petition’s theory is that because Cheok uses a physical reference point to measure a user’s physical movement, it would benefit from Nakamura’s manual input for setting a physical reference point. Pet., 40. For example, the Petition relies on Cheok’s statement that “[t]he DRM [Dead-Reckoning Modules] measures the displacement of the user from an initialization point by measuring the direction (with data obtained from the compass), and distance traveled (using accelerometer data) with each footstep taken.” Pet., 36 (citing Ex. 1006, 106). The Petition then theorizes that because “Cheok does not disclose the specific processes for an initialization step to set an initial location reference,” “[a] POSITA would have thus found it beneficial to implement Cheok based on Nakamura’s teachings of an initialization step wherein a player uses the display interface to manually input an initialization point.” The Petition thus alleges that a POSITA would incorporate Nakamura’s process for using a manual input to set a physical, real world initialization point, from which Cheok could then measure the location, direction, distance, etc., that the user has traveled in the real world. Pet., 40. But Nakamura does not disclose manually setting a **physical** initialization point

in the real world. As explained above in Section V.A.1.b, Nakamura only sets a *virtual* reference point via manual input. Nothing about that virtual reference point in Nakamura could be used to detect the actual user's physical movements as in Cheok. Thus, there is no motivation to combine.

Second, Cheok states that in Human Pacman, the players' initial virtual locations are predetermined: "3.3 Actual Gameplay. Starting the game: Pacmen and Ghosts start from the Pac-castle and Ghost-house in Pac-world respectively. These two places correspond to two different physical locations in the game area." Ex. 1006, 7. Thus, no reason exists to implement Nakamura's initial virtual location setting in Cheok, since a player in Cheok does not have an option of where to start in the virtual world. In fact, it would directly conflict with the operation of Cheok if users were allowed to manually move virtual character origin location in the virtual game world. Characters *must* start in dedicated, predetermined locations. They *cannot* be moved. Thus, for another independent reason, there is no motivation to combine.

Thus, Ground 1 fails to disclose or render obvious "a first manual input for setting a origin location setting for a location reference for gameplay," as recited in claim 4.

**2. Ground 2: Nakamura Fails To Disclose Or Render Obvious
“A First Manual Input For Setting A Origin Location
Setting For A Location Reference For Gameplay”**

In Ground 2, Petitioner argues that Nakamura discloses “a first manual input for setting a origin location setting for a location reference for gameplay.” Pet., 62-63. Petitioner is incorrect, for the same reasons as explained in Section V.A.1.b regarding Ground 1.

In Ground 2, the Petition does not point to any combination or modification of Nakamura for limitation 4[a.1]. Pet., 62-63. Thus, Ground 2 fails to disclose or render obvious “a first manual input for setting a origin location setting for a location reference for gameplay,” as recited in claim 4.

**B. All Grounds And Prior Art Combinations Fail To Disclose Or
Render Obvious “A Graphical User Interface Is Provided On Said
Display To Receive . . . A Second Manual Input For Setting A
Directional Reference For A Direction Of Gameplay For A Virtual
Character Of A Location-Based Game Provided On Said Device
Based On The Direction Of Said Device And Said Location-Based
Game Is Provided On Said Device With Respect To Said
Directional Reference And Said Directional Reference Is Operable
To Be Updated During Said Gameplay,” Which Is Required By All
Challenged Claims**

Claim 4, the only challenged independent claim, recites “a graphical user interface is provided on said display to receive... a second manual input for setting a directional reference for a direction of gameplay for a virtual character of a location-based game provided on said device based on the direction of said device

and said location-based game is provided on said device with respect to said directional reference and said directional reference is operable to be updated during said gameplay.” Ex. 1001, element 4[a.2]; Pet., 1. The challenged dependent claims (claims 5, 16, 17, and 19) all depend from independent claim 4. Ex. 1001, claims 5, 16, 17, and 19. Thus, all challenged claims require the limitation identified above.

In Ground 1, the Petition argues that Cheok in view of Foxlin077 renders obvious limitation 4[a.2]. Pet., 42. In Ground 2, the Petition argues that Nakamura in view of Benini renders obvious limitation 4[a.1]. Pet., 63. However, neither of these combinations teaches or suggests the required limitations and thus, all grounds fail to disclose or render obvious limitation 4[a.2]. All grounds thus fail and institution should be denied.

The '270 patent explains that the claimed “direction of gameplay” can be established before a new game or level begins. Ex. 1001, 15:63-16:13.

In FROGGER, for example, the origin may be near the boundary of the virtual playfield. Accordingly, the user may be prompted to select a direction for gameplay. Such a direction may be determined by the device prompting the user to point the device in a particular direction (where the direction the device is pointed in may be displayed to the user) and recording this direction.

Id., 15:67-16:7. Thus, a user can set a particular direction that the user intends to play the game. For example, a user playing FROGGER will record a certain physical direction that corresponds to the direction towards the goal area on the virtual playfield.

Similarly, the “reference direction” can be updated during the game to change the correspondence between a physical direction on a physical playfield and a virtual direction on a virtual playfield:

For example, if a user reaches the end of his/her physical playfield at the position of the grid that character 1091 resides then the user may reset that location to the origin, turn around, and set that direction and the reference direction. Before this occurred, if the user walked backward, that user may have moved into a grid position down-from the location of character 1091. Now, the user may walk in that same direction, but may move forward into the grid location above character 1091.

Id., 18:24-32. Thus, a “directional reference for a direction of gameplay,” as recited in claim 4, refers to a specific physical direction which is used as a reference to map physical directions to virtual directions on a virtual playfield.

1. Ground 1: Cheok In View Of Foxlin077 Does Not Render Obvious Limitation 4[a.2]

Ground 1 relies on a combination of Cheok and Foxlin077 as allegedly disclosing limitation 4[a.2]. Pet., 42-52. The Petition argues that Cheok discloses establishing a direction of gameplay but concedes that Cheok does not disclose “a second manual input for setting a directional reference” or that “said location-based game is provided on said device with respect to said directional reference and said directional reference is operable to be updated during said gameplay.” Pet., 43. Instead, the Petition relies on combination with Foxlin077 for that functionality. *Id.* Ground 1 fails to disclose or render obvious the above limitations for several reasons.

a. There Is No Allegation Or Disclosure That, In Either Cheok Or Foxlin077, The Claimed Second Manual Input Is Received By A Graphical User Interface

Even without addressing whether the references teach what the Petition says they do (which they do not, as explained below), Ground 1 should be dismissed quite simply because it ignores the claim requirement that the “manual input for setting a directional reference for a direction of gameplay” (which is the focus of the Petition’s argument) *is received by a graphical user interface*. Ex. 1001, claim 4 (“a graphical user interface is provided on said display to receive . . . a second manual input for setting a directional reference for a direction of gameplay.”).

There is no allegation—nor could there be—that either Cheok or Foxlin077 has such functionality. The Petition admits Cheok lacks such a manual input related to the direction of gameplay. Pet., 42. The Petition points to Foxlin077’s “initialization steps” that “establish the rest position, from which orientation is measured and measure biases for the rate sensors,” as meeting the required “second manual input for setting a directional reference for a direction of gameplay.” Pet., 46-47. That is incorrect, as explained below, but more simply, the Petition contains no allegation or evidence whatsoever that Foxlin077’s initialization steps involve a manual input received by a graphical user interface. Pet., 43-52. To the contrary, as cited by the Petition, in Foxlin077, “initialization must be conducted with the sensor assembly held stationary in a known reference orientation. In a preferred embodiment, the user is instructed 432 to place the sensor assembly in such a position.” Ex. 1008, 10:29-34; Pet., 46-47. But placing a sensor in a certain position does not disclose “a graphical user interface is provided on said display to receive . . . a second manual input.” As claimed, the input must be received by the GUI provided on the display. There is simply no allegation, nor could there be, that the alleged second manual input is received by a GUI.

b. Foxlin077 Fails To Disclose Or Render Obvious “A Second Manual Input For Setting A Directional Reference” And That “Said Location-Based Game Is Provided On Said Device With Respect To Said Directional Reference And Said Directional Reference Is Operable To Be Updated During Said Gameplay” As The Petition Alleges

The Petition concedes that Cheok fails to disclose “a second manual input for setting a directional reference” and that “said location-based game is provided on said device with respect to said directional reference and said directional reference is operable to be updated during said gameplay,” instead relying on combination with Foxlin077 for those features. Pet., 43. Specifically, the Petition points to Foxlin077’s “initialization steps.” Pet., 46-48.

Even setting aside the Petition’s total failure to allege that Cheok or Foxlin077 discloses that a “*graphical user interface* is provided on said display *to receive . . .* a second manual input for setting a directional reference for a direction of gameplay,” as explained above, Foxlin077 also fails to disclose the required second manual input itself. The Petition argues “[t]he initialization steps ‘establish the rest position, from which orientation is measured and measure biases for the rate sensors,’ as meeting the claim requirements lacking in Cheok. This fails for several reasons.

First, Foxlin077 describes only a “sensor apparatus” and does not describe or suggest any application of the sensor apparatus to a game. Therefore in Foxlin077,

the initialization steps are not used to establish anything about gameplay, much less a direction of gameplay. *See generally* Ex. 1008. The initialization steps thus fail to disclose or render obvious a “manual input for setting a directional reference for a direction of *gameplay*,” as claimed.

Second, even if Foxlin077 is or could be used in conjunction with a game, its initialization steps merely provide better physical measurement—they do not change the way Cheok allegedly establishes the direction of gameplay, converting it from one based on movement to one based on manual input. That is, the Petition’s argument is that Cheok establishes a direction of gameplay via the user’s movement (while admitting it does not do so with manual input). Pet., 42-43 (arguing that Cheok discloses a direction of gameplay because “the direction/orientation of a user’s Ghost or Pacman virtual character... is established based on the direction the user (with a wearable computer) is facing on the physical field.”). Foxlin077’s initialization process only provides for *more accurate movement detection of that very same movement in Cheok*, by providing a configuration step to better measure movement. Pet., 36 (“[A] POSITA would have understood that Foxlin077’s manual reinitialization process would be beneficial to address accumulated drift when an automatic drift compensator component is not sufficiently removing drift.”). It does not cause Cheok to establish a directional reference for a direction of gameplay via manual input. Thus, even in the combination, the “direction of gameplay”, under

Petitioner's theory, is still set by movement of the user as he or she is playing the game, rather than by a manual input received by a GUI.

Third, Foxlin077's baseline position, which is the alleged "directional reference for a direction of gameplay" is not set by manual input. The system itself provides the alleged "directional reference" (which is an orientation according to the Petition) to the user, not the other way around. The user simply carries out the system's instruction. Foxlin077 states, "[i]nitialization must be conducted with the sensor assembly held stationary in a **known reference orientation**." Ex. 1008, 10:29-31. "[T]he user is instructed 432 to place the sensor assembly in such a position by a message delivered to the apparatus input/output devices or implicitly by the fact of starting the tracker." *Id.*, 10:31-35. Thus, in Foxlin077, the system determines and provides a known reference orientation and instructs the user to hold the sensor in that orientation. The user simply follows the system's instructions, rather than manually setting the orientation. Thus, even if Foxlin077's baseline position constituted a directional reference, that directional reference would not be set by manual input.

Fourth, the alleged manual input in Foxlin077 is not "provided *on* said device." The Petition argues that in Foxlin077, initialization happens "with the sensor assembly held stationary in a known reference orientation" and that "the user is instructed 432 to place the sensor assembly in such a position." Pet., 46. But this

is not providing a manual input “on” a device; it is only at best “with” or “using” the module. Holding a sensor in a certain orientation does not provide a direction of gameplay “on” the module, because it does not, for example, press a button on the sensor or use a touchscreen on the sensor or do anything “on” the module.

The Petition also points to Foxlin077’s “reinitialization process” as disclosing that “said directional reference is operable to be updated.” Pet., 48-49. This is incorrect because, as recognized in the Petition, the reinitialization process simply repeats the same steps as the first initialization process. Pet., 48 (“the same initialization steps... are performed again.”). Thus, Foxlin077’s reinitialization process fails to disclose or render obvious this limitation for the same reasons as the initialization steps.

Fifth, Foxlin077 does not disclose or render obvious “said location-based game is provided on said device with respect to said directional reference.” The Petition baldly equates Foxlin077’s “main operating steps” with a location-based game. Pet., 47. But again, Foxlin077 has nothing to do with games, much less a location-based game. Foxlin077’s “main operating steps generate a set of signals that correspond to the output orientation angles.” Ex. 1008, 10:8-9. “During the execution of the operating steps, the user may generate commands, or a command may be generated by the host computer to which the orientation tracker is connected.... Typical commands include: to change operation between metric and

English units; resetting the origin; reinitializing the operation; quitting; calibration; switching between continuous reporting and demand-made reporting; etc.” *Id.*, 10:11-20. In other words, Foxlin077’s “main operating steps” concern only tracking a user’s head movement, a far cry from providing a location-based game.

Despite this, Petitioner argues, without any further explanation, that because “the main operating steps are performed with respect to this reference orientation,” Foxlin077 discloses “said location-based game is provided on said device with respect to said directional reference.” Pet., 47 (citing Welch ¶ 161, which mirrors the Petition’s allegations verbatim). Petitioner is incorrect; indeed, Foxlin077 admits that its sensor does not track a user’s location, which is an essential feature for providing a location-based game. Ex. 1008, 6:22-23 (“The invention does not produce *position* information, only *angular orientation* information.”). Thus, Foxlin077 fails to disclose or render obvious “said location-based game is provided on said device with respect to said directional reference.” Similarly, Foxlin077 also fails to disclose or render obvious that “said directional reference is operable to be updated during said gameplay,” because Foxlin077 does not disclose any gameplay.

c. There Is No Motivation To Combine Cheok And Foxlin077

Separately, there is no motivation to combine Cheok and Foxlin077, because a POSITA would have no reason to incorporate Foxlin077’s initialization steps into

Cheok to establish a “directional reference for a direction of gameplay.” According to the Petition, Cheok teaches establishing a direction of gameplay by virtue of tracking a user’s head movement and orientation during gameplay. Pet., 42-43. There is no motivation to modify Cheok’s method for allegedly determining the direction of gameplay to require a manual input; it already allegedly determines direction by the user’s physical movement, which the user will already do while playing the game. This is a much more efficient process than requiring a separate step of manual user input, as proposed by the Petition. Pet., 42-43. The Petition first alleges that both Cheok and Foxlin077 use an “InertiaCube2” sensor. Pet., 44. But Foxlin077 says nothing about the InertiaCube2 sensor. And even if the references do use the same motion sensor, it is insufficient to establish a motivation to modify Cheok. Requiring a manual user input for a directional reference for a direction of gameplay has drawbacks to user experience; it slows down the beginning of gameplay and complicates the overall system, removing the natural feel of playing without having to set up the game, when Cheok already works for its intended purpose. The authors of Cheok apparently designed and manufactured a real system, and chose not to incorporate requiring a manual user input to set a directional reference before the user could start the game. The Petition concedes this when it cites that Cheok *already* “measures the displacement of the user from an initialization point by measuring the direction.” Pet., 42.

And the Petition's rationale regarding "drift" and sensor accuracy does not establish a reason to prompt the user for manual input regarding a direction. Pet., 45, 50. For one, Cheok does not have an accuracy problem; indeed, it states "head movement and orientation is tracked to high accuracy." Pet., 42; Ex. 1006, 4. In fact, contrary to what the Petition implies, the quote relied on by the Petition explicitly states that it already addresses "sensor-tracking issues" and it leaves *other* issues unaddressed as exceeding the scope of the paper:

In Human Pacman, we tried to combine materials from *cognitive psychology and sociology* with that from computer science. However the vast amount of issues encountered have exceeded the scope of this paper. Therefore we *will concentrate on discussing sensor-tracking issues* with respect to Human Computer Interface design.

Ex. 1006, 10; Pet., 50. The Petition's selective quotation to imply that "Cheok suggests that the sensors incorporated in the wearable computer may have tracking issues... that 'exceed the scope of the paper'" is thus misleading and its conclusion is incorrect. Pet., 50. Cheok actually says the opposite; certain items related to cognitive psychology and sociology might be outside the scope of the paper, but sensor tracking issues are addressed. Nor is Cheok's alleged discussion of GPS inaccuracy relevant; Foxlin077 has nothing to do with improving GPS accuracy. Ex.

1008, 6:22-23 (“The invention does not produce position information.”). Furthermore, establishing a baseline for drift measurement does not constitute a manual user input to set a directional reference. They are simply unrelated concepts; the former has to do with accurately measuring rotation; the latter relates to a user manually informing the system via a GUI in what direction he or she is going to be playing.

Thus, the combination of Cheok and Foxlin077 fails to disclose or render obvious “a second manual input for setting a directional reference for a direction of gameplay for a virtual character of a location-based game provided on said device based on the direction of said device and said location-based game is provided on said device with respect to said directional reference and said directional reference is operable to be updated during said gameplay,” as recited in claim 4.

2. Ground 2: Nakamura In View Of Benini Does Not Render Obvious Limitation 4[a.2]

Ground 4 relies on a combination of Nakamura and Benini as allegedly disclosing limitation 4[a.2]. Pet., 63-74. The Petition argues that Nakamura discloses setting the required directional reference for a direction of gameplay but concedes that it does not disclose (1) the required “manual input”; and (2) that the “directional reference is operable to be updated during said gameplay.” Pet., 63-64 (arguing that Nakamura discloses, as underlined: “a second manual input for setting

a directional reference for a direction of gameplay for a virtual character of a location-based game provided on said device based on the direction of said device and said location-based game is provided on said device with respect to said directional reference and said directional reference is operable to be updated during said gameplay.”). The Petition instead relies on Benini for this admittedly-missing functionality. *Id.*

The Petition is wrong about both what Nakamura discloses and what Benini discloses, and there is no motivation to combine.

***a. Nakamura Fails To Disclose Or Render Obvious
“Setting A Directional Reference For A Direction Of
Gameplay For A Virtual Character Of A Location-Based
Game Provided On Said Device Based On The Direction
Of Said Device And Said Location-Based Game Is
Provided On Said Device With Respect To Said
Directional Reference” As The Petition Alleges***

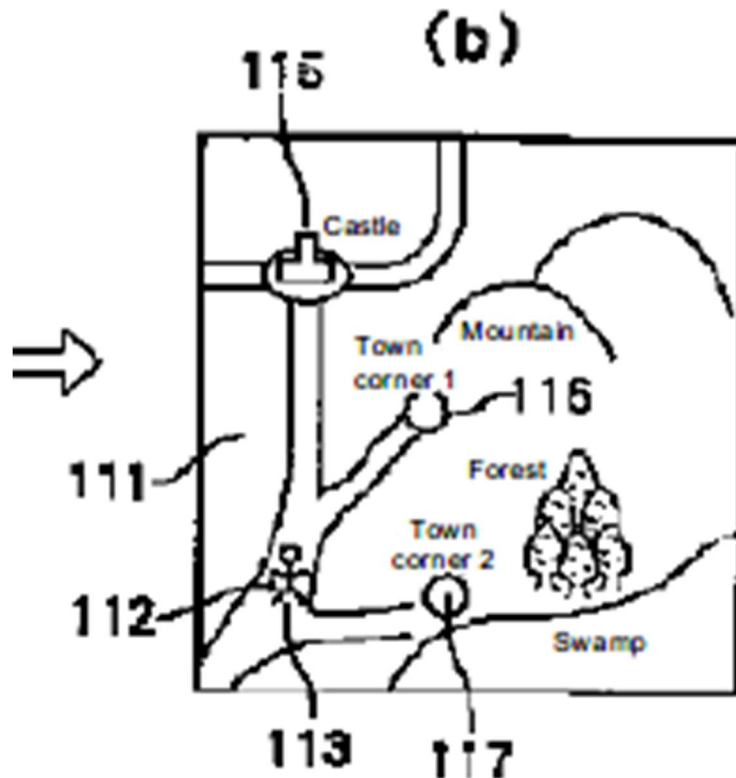
First, the Petition argues that “Nakamura discloses *setting a directional reference for a direction of gameplay for a virtual character of a location-based game provided on said device based on the direction of said device and said location-based game is provided on said device with respect to said directional reference.*” Pet., 63.

The Petition identifies Nakamura’s disclosure of a direction sensor and a display rotating feature as allegedly disclosing all of the above-italicized claim elements. Pet., 63-64 (citing Ex. 1007, ¶¶ [0017], [0024]). However, simply rotating

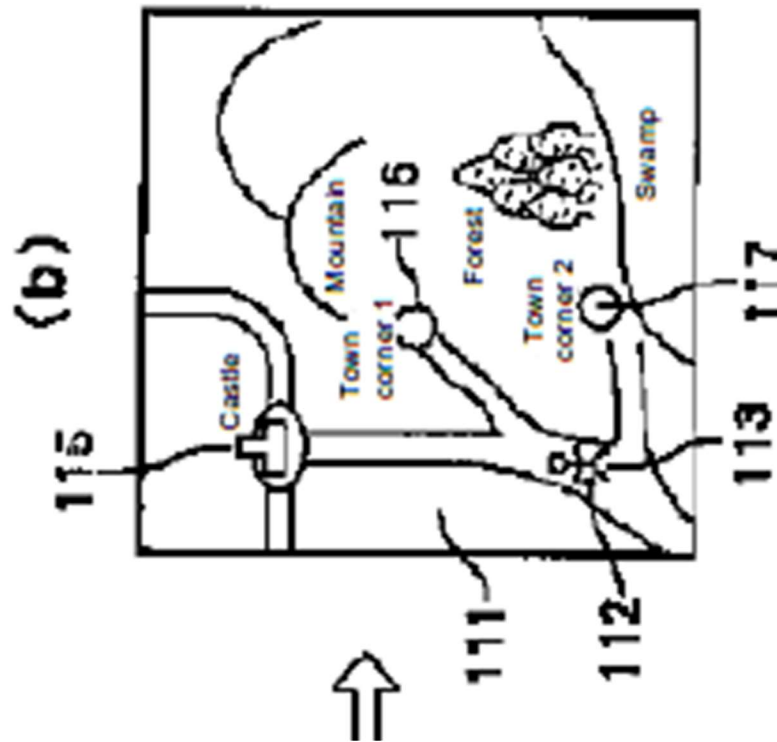
a display of a virtual world, as described in Nakamura, is not setting a directional reference.

Nakamura states that “it is possible to add a feature that rotates and displays the virtual world so that virtual displacement always points upwards, based on the direction of movement (actual displacement) obtained from the GPS unit 51.” Ex. 1007, ¶ [0024]. In other words, Nakamura merely describes rotating the orientation of the map of the virtual world that is shown on a display screen, such that the virtual character is always moving upwards *on the screen*. But rotating the screen does not constitute setting a directional reference for a direction of gameplay, which is about determining which physical direction on a physical playfield corresponds to which virtual direction in a virtual world, not simply changing how the virtual world is displayed. Ex. 1001, 18:24-32.

To illustrate, consider Nakamura’s Figure 9(b), which shows a map of a virtual world:



Ex. 1038, Fig. 9(b), ¶ [0035] (“[A]s shown in Figure 9(b), the function 31 for displaying the virtual world displays the first screen (the first virtual world) 111 of the role-playing game.”). If the user walks to the right, the virtual character will walk to the right towards the “swamp” in Figure 9(b). If Nakamura’s display rotation feature is implemented, when the user walks to the right, the screen will rotate such that the virtual character is still walking upwards on the screen:



Ex. 1038, Fig. 9(b) (rotated). However, this screen rotation does not set a directional reference for a direction of gameplay. It is simply rotating a screen. The motion, both real and virtual, is not impacted in any way whether the screen is rotated. The person moves wherever he or she moves in the real world, and the virtual character moves in the corresponding way in the virtual world. Nothing about a direction of gameplay or a directional reference for a direction of gameplay is changed in any way by the mere rotation of the screen. The rotation's only effect is the way that the virtual world is presented on the screen. Thus, Nakamura fails to disclose or render obvious "setting a directional reference for a direction of gameplay for a virtual

character of a location-based game provided on said device based on the direction of said device and said location-based game is provided on said device with respect to said directional reference,” as the Petition alleges.

b. Benini Fails To Disclose Or Render Obvious “A Second Manual Input For Setting A Directional Reference For A Direction Of Gameplay” And “Said Directional Reference Is Operable To Be Updated During Said Gameplay,” As The Petition Alleges

The Petition concedes that Nakamura does not disclose: (1) a second manual input for setting the directional reference; and (2) that the directional reference is operable to be updated during gameplay. Pet., 64-65. The Petition relies on combination with Benini for that functionality. *Id.*, 64-74. But Benini fails to supply the missing limitations for multiple reasons.

First, Benini describes “exploring the potential of using portable devices in managing interaction in (semi)Immersive Virtual Reality (IVR) systems reconstructing cultural heritage objects and environments.” Ex. 1009, Abstract. The Petition alleges that Benini discloses these claim elements because it describes arrow buttons which “are used to turn around and to look up and down....” Pet., 67-69 (citing Ex. 1009, 4, Fig. 2). According to the Petition, the “arrows can be used to ‘change [the] camera’s position and orientation (interacting with the 2D map or with the arrows),’ thereby changing the view in the environment.” Pet., 68.



Figure 2: The User Interface developed for interacting via PDA with the Nu.M.E. VE

Pet., 68 (showing annotated Ex. 1009, Fig. 2). Petitioner thus argues that changing the orientation of a 2D map constitutes setting a “directional reference for a direction of gameplay.” Pet., 68. Not so. For one, there is no gameplay in Benini. Benini does not disclose a game of any sort; its purpose is to “reconstruct[] cultural heritage objects and environments” and allow users to view virtual heritage sites. Ex. 1009, Abstract. And even if the user interaction in Benini could be characterized as a “game,” it would not be location-based because Benini does not track a user’s physical location, instead employing user interface buttons to navigate a virtual environment. Thus, Benini does not disclose or render obvious a “direction of *gameplay* for a virtual character of a *location-based game*.”

Moreover, even if Benini's navigation constituted gameplay or was combinable with gameplay, using Benini's arrow buttons to rotate the view does not set a directional reference for a direction of gameplay. Rather, in Benini, using the arrow buttons is how the user navigates the virtual world (*i.e.*, how the user plays the alleged "game"). There is no "reference" for anything. The user is simply playing the alleged "game."

Second, the required second manual input needs to be "provided on said device based on the direction of said device." Here, the alleged input is a manually-pressed button that rotates the view, rather than being based in any way on the direction of the device. But the Petition proposes using that very button-based input in Benini to rotate the screen in Nakamura, because it allegedly lacks details regarding how to rotate the screen (although that is incorrect, as explained below). Pet., 69. Although there is no reason to use arrow buttons in Nakamura, as explained below, even if it were done, the resulting system would not include a "manual input for setting a directional reference for a direction of gameplay for a virtual character of a location-based game provided on said device based on the direction of said device," because the alleged manual input for setting a directional reference would be based on the arrow key presses, which has nothing to do with "the direction of said device," *e.g.*, which direction the device is pointing.

Thus, for several reasons, the combination of Nakamura and Benini fails to disclose or render obvious “a second manual input for setting a directional reference for a direction of gameplay for a virtual character of a location-based game provided on said device based on the direction of said device and said location-based game is provided on said device with respect to said directional reference and said directional reference is operable to be updated during said gameplay,” as recited in claim 4.

c. There Is No Motivation To Combine Nakamura And Benini

Further, a POSITA would have had no reason to combine Benini’s arrow buttons into Nakamura. Pet., 69-73. Benini’s arrow buttons enable a user to “walk” and “look.” Ex. 1009, Fig. 2. That is, a user uses the arrows to navigate around Benini’s 2D map. But in Nakamura, a user navigates the virtual world by moving in the real world. Ex. 1038, ¶ [0031]. Indeed, that a user navigates a virtual world by physically moving is one of Nakamura’s key features. *Id.*, Abstract. Even worse for the Petition’s argument, the Petition’s stated rationale for the combination is that “Nakamura discloses a rotation feature” that automatically allows “virtual displacement to always point upward” but “does not disclose the specific processes for rotating the display of the virtual world.” Pet., 64, 68-69. Thus, the argument goes, a POSITA would use the buttons from Benini to rotate the screen. That makes no sense and contradicts the Petition’s description of Nakamura. Nakamura states

that this functionality is performed using a direction sensor, and then the screen rotates. Ex. 1038, ¶ [0017] (“[I]f the installed terminal is a device equipped with a direction sensor, it is possible to rotate the display of the virtual world...”). Accordingly, a POSITA would have no reason to implement Benini’s “walk” and “look” *arrow buttons* into Nakamura’s system, which already automatically senses and detects the user’s movement and rotation. Not only would this be redundant, slower, less user friendly, and require unnecessary user input, but it would actually subvert the entire point of Nakamura’s location and direction sensing features.

In short, Benini’s arrow keys are simply incompatible with Nakamura’s location-based gameplay. To the extent the Petition is arguing that there is no disclosure regarding how to actually move the image on the screen in Nakamura, that is not, and is not alleged to be, provided by Benini. Rather, what is relied on in Benini is a detection of which direction the user wants to move the map by a user pressing a button corresponding to the direction desired to rotate the view. But Nakamura already discloses automatically detecting this direction by measuring a user’s physical movements. There is no reason to substitute in Benini’s buttons for Nakamura’s automatic detection. Moreover, the movement of the screen image in Nakamura and Benini is not analogous—Nakamura rotates the orientation of the same virtually-created image so that the character always moves in the “up”

direction on the screen, while Benini moves a real-world map image to actually view and explore *different parts* of heritage sites to see something different and new.

Thus, for many reasons, there is no motivation to combine Nakamura and Benini in the manner suggested by the Petition.

VI. Conclusion

For the above-described reasons, Patent Owner respectfully requests that the Board deny institution.

Dated: July 18, 2025

Respectfully submitted,

/Peter F. Snell/

Peter F. Snell (Reg. No. 52,235)
Brad M. Scheller (Reg. No. 61,022)
MINTZ, LEVIN, COHN, FERRIS,
GLOVSKY AND POPEO, P.C.
919 Third Avenue
New York, New York 10022
Telephone: 212-935-3000
Facsimile: 212-983-3115
E-mails: PFSnell@mintz.com;
BMScheller@mintz.com

Reza Dokhanchy (Reg. No. 62,795)
MINTZ, LEVIN, COHN, FERRIS,
GLOVSKY AND POPEO, P.C.
3580 Carmel Mountain Rd Suite 300,
San Diego, CA 92130
Telephone: 858-314-1596
Facsimile: 858-314-1501
E-mail: RDokhanchy@mintz.com

CERTIFICATE OF WORD COUNT

The undersigned certifies that the portions of the above-captioned PATENT OWNER'S PRELIMINARY RESPONSE specified in 37 C.F.R. § 42.24 have 9,908 words, in compliance with the 14,000 word limit set forth in 37 C.F.R. § 42.24(b)(1). This word count was prepared by the word-processing program used to prepare this paper (Microsoft Word).

Dated: July 18, 2025

/Peter F. Snell/

Peter F. Snell (Reg. No. 52,235)

CERTIFICATE OF SERVICE

I certify that a copy of this Patent Owner's Preliminary Response is being served by electronic mail on the following counsel of record:

Lead Counsel

Lisa K. Nguyen
(Reg. No. 58,018)
PAUL HASTINGS LLP
1117 S. California Avenue
Palo Alto, CA 94303
Telephone: (650) 320-1800
Facsimile: (650) 320-1900
PH-Meta-
MullenIPRS@paulhastings.com

Backup Counsel

David M. Tennant
(Reg. No. 48,362)
PAUL HASTINGS LLP
2050 M St., N.W.
Washington, DC, 20036
Telephone: (202) 551-1700
Facsimile: (202) 551-1705
PH-Meta-
MullenIPRS@paulhastings.com
Kamilah Alexander
(Reg. No. 57,210)
PAUL HASTINGS LLP
1117 S. California Avenue
Palo Alto, CA 94303
Telephone: (650) 320-1800
Facsimile: (650) 320-1900
PH-Meta-
MullenIPRS@paulhastings.com
Alexa J. Lowman (*pro hac vice* to be
filed)
PAUL HASTINGS LLP
2050 M St., N.W.
Washington, DC, 20036
Telephone: (202) 551-1700
Facsimile: (202) 551-1705
PH-Meta-
MullenIPRS@paulhastings.com

Dated: July 18, 2025

/Peter F. Snell/

Peter F. Snell (Reg. No. 52,235)