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. IPR2025-00741
U.S. Patent No. 11,376,493

PATENT OWNER'S PRELIMINARY RESPONSE

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Exhibit	Description
2001	Dictionary definition of "Playing field" – Merriam-Websters Collegiate Dictionary. 10th Ed., 2001
2002	Dictionary definition of "playing field" – The Chambers Dictionary, 2003
2003	Dictionary definition of "playfield" – Dictionary of Architecture & Construction, 2000
2004	Dictionary definition of "playfield" – Webster's Third New International Dictionary of the English Language Unabridged, 2002
2005	*Reserved*
2006	Nett Warrior Initial Operational Test and Evaluation (IOT&E) Report, Operational Test & Evaluation, May 2015 https://apps.dtic.mil/sti/tr/pdf/ADA626617.pdf
2007	Image of DeltaScan GL Pro Video Converter, https://www.recycledgoods.com/vine-micros-gnp-00336-deltascan-gl-pro-ntsc-no-x-fdr-video-converter/?srsltid=AfmBOoqrojqO51uLN3J_oFijAxVxgwCTmqF4a0BMklzO8ufDrWXFuHWb
2008	*Reserved*
2009	Image of CCD Camera, https://bmisurplus.com/product/cohu-2122-1000-0000-ccd-camera-with-cosmicar-pentax-25mm-11-4-lens/

2010	Parallax Definitions for Land Surveyors – Learn CST, https://learncst.com/parallax-definitions/

Mullen Industries LLC ("Patent Owner" or "Mullen") submits this Preliminary Response to the Petition for *Inter Partes* Review ("Petition") of U.S. Patent No. 11,376,493 ("the '493 Patent") filed by Meta Platforms, Inc. ("Petitioner").

I. Introduction

The '493 patent improves upon prior-art virtual reality ("VR") systems in which a user might unintentionally run into objects while playing the game due to obscured vision. It also improves prior systems that attempted to solve that problem by using safety rails surrounding a small platform, which provided some measure of safety but still presented risks and prevented using natural body movement to play a game and instead relied on joysticks and the like.

The Board should deny institution because Ground 1, the sole ground relied on for the only challenged independent claim, fails to teach "a physical *playfield*," which under the proper construction is a "bounded physical play space," and is required by all claims, and the other grounds exclusively rely on Ground 1 for that element. The Petition points only to Jaszlics for the physical playfield requirement, but Jaszlics adopts the prior-art approach wherein a user plays a game in unbounded space, leading to exactly the problems with the prior art described in the '493 patent: that the user might run into objects unintentionally while playing. Nor does the Petition propose modifying this aspect of Jaszlics or supplementing it with any

reference. Ground 2 only adds a reference to the Ground 1 combination to attempt to address dependent claims, but they do not modify the independent claim allegations of Ground 1. All grounds thus fail to teach a "physical playfield," required by all claims.

Further, Ground 1 is the sole ground that addresses the limitation "a detector that is operable to be head-worn, wherein said detector is operable to determine landscape characteristics of said physical playfield, wherein said landscape characteristics are utilized by said location-based video game," as required by claim 1. But Jaszlics provides no such teaching, nor is there a reason to modify Jaszlics to contain a detector that is operable to be head-worn, as such a device simply adds weight to what the user must carry on his or her head without any articulated benefit. Nor is there any reason to make such a modification in light of Sofer or Ronzani. Jaszlics's long-range scanning needs of up to multiple kilometers for a war game simulation cannot be achieved with Sofer's lightweight, low-power, head-mounted scanner that is limited to a range of 20 meters, designed to assist blind people by audibly describing what is directly in front of them. Jaszlics needs a high-power scanner, which is precisely why it explicitly uses a commercially-available, traditional, long range surveyor's scanner. Petitioner's alternative theory fails as well because Jaszlics's active flash ranging and passive stereoscopic ranging methods cannot be achieved with just the single camera of Ronzani (the alleged head-worn

detector for determining landscape characteristics) or alternatively Sofer's cameras. The references are also technically incompatible, as Jaszlics creates combined real and virtual images, while Sofer and Ronzani have no such capabilities. The Petition fails to reconcile the significant differences between the detectors of Jaszlics and those of Sofer or the camera of Ronzani, nor does the Petition explain how the imager of Sofer or the camera of Ronzani would work in the image combination-based system of Jaszlics or what modifications would be needed to combine the systems.

There is a similar lack of motivation to modify Jaszlics so that its alleged "portable device" (the head-mounted display visor or goggles) includes "a device for updating the physical location of said device on said physical playfield, wherein the physical location of said device is utilized by said location-based video game," as required by claim 1. The Petition argues that a soldier would benefit from moving a GPS unit to the solder's head-worn gear but fails to substantiate that, and indeed ignores the drawbacks of increased weight being worn on the head for no benefit. The lack of obviousness is emphasized by the fact that real-life examples show that systems for location tracking of soldiers continued to use body-worn GPS, not head-worn.

Ground 2 only adds a reference to the Ground 1 combination to attempt to address dependent claims, but they do not modify the independent claim allegations

of Ground 1. All grounds thus fail to render obvious "a detector that is operable to be head-worn, wherein said detector is operable to determine landscape characteristics of said physical playfield, wherein said landscape characteristics are utilized by said location-based video game," and a "portable device" that includes "a device for updating the physical location of said device on said physical playfield, wherein the physical location of said device is utilized by said location-based video game," (claim 1).

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

II. Technology Primer And Prior Art Problem

A. Virtual Reality

Virtual Reality devices are immersive technologies that enable users to experience digitally-rendered content in both physical and virtual space. VR systems may use head-mounted displays (HMDs) to block external images and provide a more immersive experience and can be used for entertainment and gaming. These technologies raise unique safety considerations, especially when users move around while wearing HMDs. In some cases, users may be at risk of colliding with real-world objects.

B. Prior Art Problems

The ’493 patent identifies several problems with prior art VR systems. The patent explains that “Virtual Reality (VR) systems have been developed in which a user is provided with a non-transparent head-mounted display.” Ex. 1001, 1:22-24. “This display provides images to the user such that the user is immersed in a virtual, alternate reality.” *Id.*, 1:24-25. However, “[a] user cannot see his/her physical environment while immersed in such a virtual, alternate reality.” *Id*., 1:26-27. Thus, “VR systems are deficient because a user cannot easily move around a physical environment while immersed in the virtual reality because a user cannot see his/her physical environment,” because “[i]f a user begins to physically move in his/her physical environment without being able to see his/her physical environment then the user may trip, or bump into, a physical object (e.g., a rock or chair).” *Id.*, 1:28-34.

The prior-art solution was that “a user is traditionally placed on a platform that is surrounded by padded safety rails. A user cannot move outside of this protected platform and moves through the virtual, alternate reality created by the VR system through the use of a manual joystick.” *Id.*, 1:36-40. An example of such a solution is depicted below:

However, "[s]uch a VR system is deficient because it severely limits the way that a user may interact with the virtual, alternate reality provided by the VR system." Ex. 1001, 1:40-42. In such systems, the joystick, for example, "provides the main control signal to a video game," and "the main control signal controls the location of a video game character in a virtual world." *Id*., 1:46-49. "Such controls, however, are deficient because the controls require unnatural user movement to generate the primary control signal. It is therefore desirable to provide a primary control device that does not require unnatural user movement to generate a primary control signal to a video game." *Id.*, 1:49-54.

The ’493 patent thus identifies that the 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 led to unnatural movement requiring a joystick to move a character in a game. The ’493 patent proposes a better solution.

III. The Challenged Patent

The ’493 patent inventor designed a solution to the prior-art VR-gaming system problems that alleviates the mobility constraints associated with traditional systems, while still providing safety against obstacles. The patent describes a “location-based game system is provided in which a user’s physical position on a physical playfield . . . correlates to a video game character’s location in a virtual playfield,” and thus “a video game character may be controlled without the need for a joystick.” *Id.*, 1:58-63.

The patent’s solution to ensure that a user will not unintentionally run into objects while playing the game is to establish boundaries in a play space, limiting play to a “physical playfield,” as recited in all challenged claims, rather than allowing user movement in unbounded space. Examples of such physical playfields include a “playmat,” a “pre-determined area . . . of a military base,” a “fenced-in backyard,” a “soccer field,” or “a basketball court.” *Id.*, 2:67-3:3, 5:31-32, 12:13-14,

12:15, 14:49. The patent describes creating a mapping between a particular physical playfield and the virtual playfield to enable many of the system's key features, as depicted in Figure 3, showing the physical (actual) playfield on the left and the virtual playfield on the right:

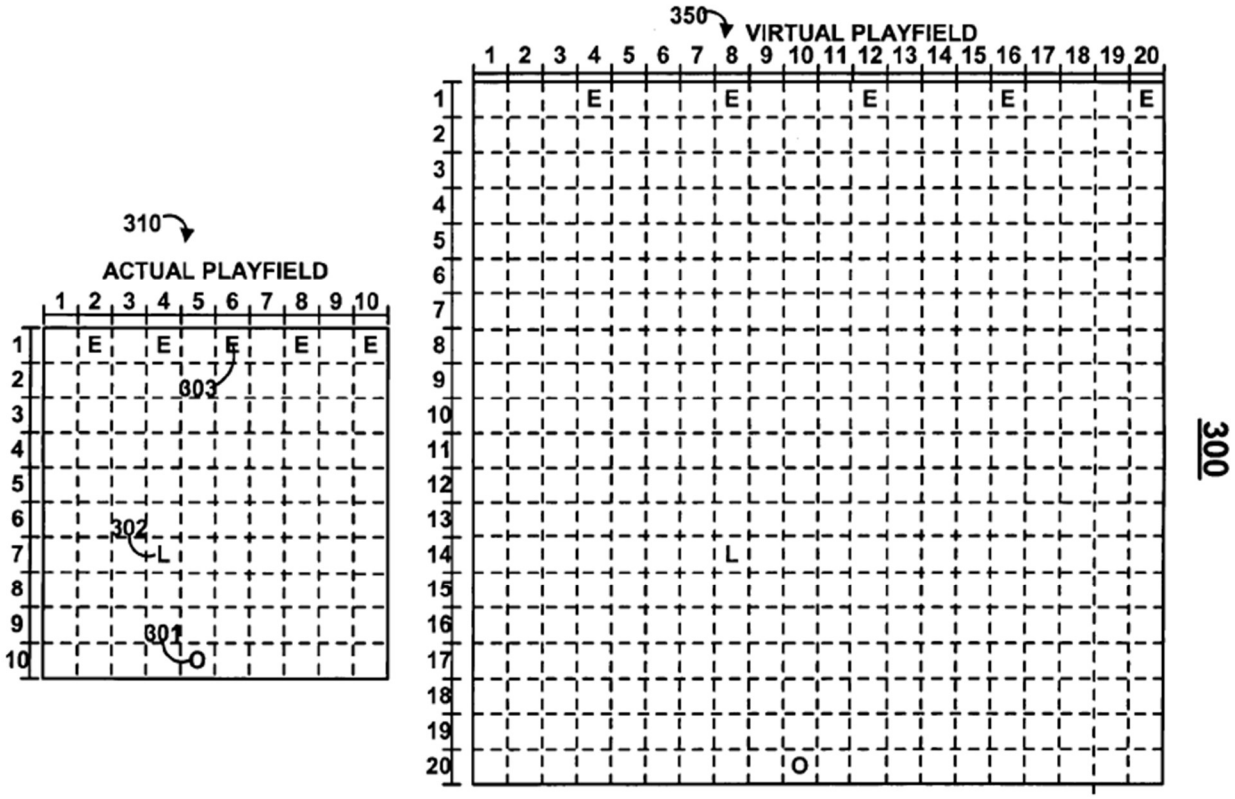


FIG. 3

Ex. 1001, Fig. 3. The patent further confirms that the playfield is bounded by explaining that "players may cho[o]se an actual playfield dimension from a variety of dimensions (e.g., 10 feet by 10 feet or 20 feet by 20 feet) and information may be stored according to these dimensions and transmitted to an intermediary (e.g., a database stored on a remote database)." *Id.*, 14:50-55. The patent describes

collecting and storing a variety of information about the playfield and its boundary for use in the game:

> Information about a playfield may include, for example, the parameters of the playfield, scaling information, and the status of the playfield (e.g., where a particular user is located in an actual playfield and where a user is located in a virtual playfield). The information about a playfield may also include where actual objects are located (e.g., the areas of an actual playfield where impenetrable objects such as house or boulder are located). The information about a playfield may also include where virtual objects are located (e.g., the areas of a virtual playfield where a virtual sword or treasure is located).

Id., 12:16-31. "Such a playfield data structure may be used as the *primary information structure for the game* such that program logic refers to information in the playfield structure to determine game events (e.g., point scoring, deaths, level completions)." *Id.*, 18:63-67.

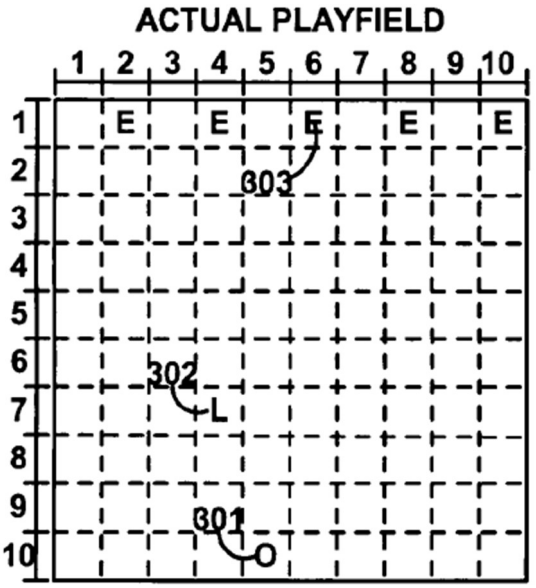
Importantly, the physical playfield boundaries need not be hard physical boundaries like the safety rails of the prior art, but are known to the system and can be conveyed to the user during gameplay, while still allowing a user to move around the playfield without requiring a joystick to move the character. For example, when playing a "FROGGER" game, "[a]fter the user has completed a level (or dies), that user may be instructed to return to the origin position," a functionality made possible by virtue of the system's knowledge of the boundaries of the physical playfield. *Id.*,

3:24-28. For example, "[a] user therefore may start at origin O (noted on actual playfield 310 as position 10, 5 or information/location 301) and move up 3 feet and to the left 1 foot to be at location L (noted on actual playfield 310 as position 7, 4 or information/location 302)." *Id*. 13:16-20.

Similarly, the bounded nature of the playfield solves the safety problems of the prior art in a better way than the prior art did, by enabling "event" activity, including warning a user when he or she is reaching a boundary of the actual physical playfield:

> A playfield may also have event data (such as data E at location 1, 6 on playfield 310 or information/location 303). Event data may trigger an action if someone occurs at that event location, in relation to that event location, or in relation to the event data. For example, event data may be configured such that if a user (e.g., a manually controlled virtual character) enters location storing event data E, or location 303, an event occurs (e.g., the level is completed or the game develops in a particular way).

Id., 13:41-49.



Id., Fig. 3 (partial). As shown in the partial Figure 3 above, the event data E is located at a perimeter of the constructed playfield (*e.g.*, "location 1, 6 on playfield 310 or information/location 303"; *id.*, 13:42). Also in reference to FIG. 3, the patent further describes that it can notify the user that he or she has reached the end of the physical playfield, and thus prevent the user from venturing into dangerous areas outside the playfield in which he or she might run into an object:

> [A]ctual playfield matrix 310 (or a playfield matrix) may be utilized to store location information and operate the game . . . In this manner, a processor may periodically (or in real time) update the location of game objects or the status of the game (e.g., environment objects, enemy objects, and interactive objects) based on particular characteristics of the game. ***For example, if, for any period or at any time, a user's location corresponds to the location of an end object (as stored in***

> ***actual matrix 310) then the game may determine that the game has ended and display associated graphics to the user by way of a display***.

Id., 14:23-35.[1]

The bounded nature of the physical playfield also enables scaling to the virtual world, a key feature of the patent. The patent states that "[g]enerally, locations on different playfields are scaled according to a relationship between the structure of the two playfields." *Id*., 13:27-29. This ability relies on the bounded nature of the actual playfield, such that "data may be stored on a matrix (or other data structure such as a database accessed by a memory pointer) corresponding to an actual playfield location (e.g., matrix location 7, 4)" and "[a]ctual playfield data (such as actual location information) may then be scaled and stored on a second playfield data structure (e.g., as location 14, 8 on a second matrix) such that, for example, a scaling functionality can be provided." *Id*. 13:20-27. The scaling enables varied correspondence between physical and virtual playfields, which is useful, for example, for enabling different game modes and speeds, as well as multi-user gameplay where the users are playing in differently-sized physical playfields but the same-sized virtual playfield. *Id.*, 9:18-22, 10:29-36, 12:6-15, 12:59-13:6, 14:36-15:3. The scaling factor can also be used in conjunction with known physical

[1] All emphasis herein is added unless otherwise noted.

playfield boundaries to reduce recurring errors; for example, "[i]n configuring the size of the playmat, and appropriately scaling the location-based game to the playmat, the amount of time before noticeable errors accrue can be manipulated . . . [A] number of location-based systems can be fabricated in which noticeable errors may never accrue." *Id*., 3:10-19.

Even without scaling, the bounded nature of the physical playfield is critical. For example, "[i]n a dedicated single player game with no scaling capabilities, for example, actual playfield matrix 310 (or a playfield matrix) may be utilized to store location information and operate the game . . . In this manner, a processor may periodically (or in real time) update the location of game objects or the status of the game (e.g., environment objects, enemy objects, and interactive objects) based on particular characteristics of the game." *Id*., 14:22-30.

Thus, by using a physical playfield, which as explained below is a "bounded physical play space," the patented functionality provides a solution to the problem of a user's movement during gameplay leading him or her to run into an object, while avoiding the problems associated with the prior-art solution of using a confined platform with close safety rails, which precludes natural movement and requires a controller to move the character.

The '493 Patent describes a "portable device" that includes "a display that is operable to be head-worn, wherein 3-D video game indicia is operable to be provided

on said display with respect to a physical playfield, and said 3-D video game indicia is associated with a location-based video game." *Id.*, Claim 1. An example of the architecture of the head-mounted device (e.g., "game system 1401") is described and illustrated in reference to FIG. 14 of the '493 Patent, provided below. *Id.*, 20:64, 21:16-18 ("Portable gaming devices 1460 (e.g., handheld device 100 of FIG.1 or head-mounted device 452 of FIG. 2 or a cell phone) may be utilized as game systems.").

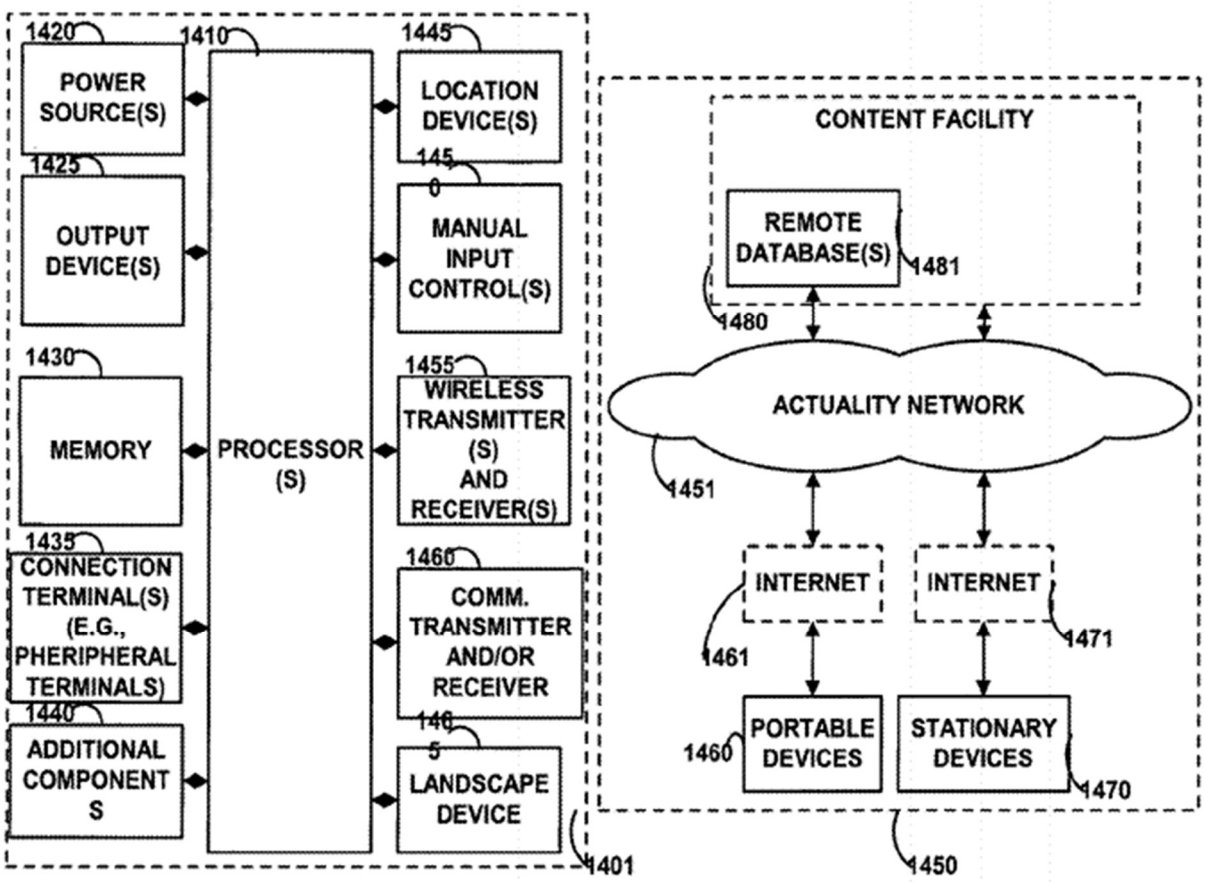


FIG. 14

Id., FIG. 14. As shown in FIG. 14, the head-mounted device (e.g., game system 1401) includes a processor(s) 1410 which is coupled to "any number of power sources 1420, output devices 1425, memory 1430, connection terminal (e.g., input, output interfaces) 1435, additional components 1440, location devices (e.g., GPS, LPS, accelerometers, gyroscopes, inertial movement sensors, hybrid location systems) 1445, manual input controls 1450, wireless transmitters and receivers 1455 and other communication transmitters and receivers (e.g., blue tooth, WiFi, wireless LAN, infrared, radio), landscape device 1465." *Id.*, 20:66-21:8; FIG. 14. Advantages of the head-mounted device having the processor 1401 and the other architecture described above are evidenced throughout the disclosure of the '493 Patent. For example, the '493 Patent describes:

> The information provided by the landscape detector [e.g., landscape device 1465] may be utilized . . . to position where portions of a video game playfield, objects, and characters may be positioned on a display (e.g., on a head-mounted display). Such information may also be used . . . to control the movement characteristics of computer-controlled video game characters and indicia . . . Thus, the head-mounted display may, in itself, provide control signals to a video game.

Id., 4:28-41.

> [The] processor may periodically (or in real time) update the location of game objects or the status of the game (e.g., environment objects,

> enemy objects, and interactive objects) based on particular characteristics of the game. For example, if, for any period or at any time, a user's location corresponds to the location of an end object (as stored in actual matrix 310) then the game may determine that the game has ended and display associated graphics to the user by way of a display [e.g., the head-mounted display].

Id., 14:27-35.

The challenged independent claims themselves capture the above-described features:

> 1. A portable device comprising:
>
> a display that is operable to be head-worn, wherein 3-D video game indicia is operable to be provided on said display with respect to a **physical playfield**, and said 3-D video game indicia is associated with a location-based video game;
>
> a detector that is operable to be head-worn, wherein said detector is operable to determine landscape characteristics of said **physical playfield**, wherein said landscape characteristics are utilized by said location-based video game; and
>
> a device for updating the physical location of said device on said **physical playfield**, wherein the physical location of said device is utilized by said location-based video game.

IV. The Proper Claim Construction

The Petition's section addressing claim construction asserts that the prior art cited renders the challenged claims obvious under any reasonable construction, and does not identify any terms for construction. Pet., 8. Patent Owner disagrees. Accordingly, relevant to the issues here, Patent Owner submits that the Board should construe the following term and limitation.

1. "physical playfield" (Claim 1)

As described above in Section III, the correct construction of the claimed "physical playfield" in claim 1 is a "bounded physical play space." *See, e.g.*, Section III; Ex. 1001, 1:60-61, 2:67-3:3, 5:29-33, 12:6-15, 14:45-50. This construction follows from the intrinsic evidence and dictionary definitions.

As discussed in Section III, the specification makes clear that the play space must be a bounded space, *i.e.*, a physical playfield. The patent's goal of preventing a user from straying and accidentally running into an object, while still allowing enough freedom of movement to play the game naturally and without a joystick, is central to the invention and the meaning of the "physical playfield." As explained in Section III, the bounded nature of a playfield is a central aspect of the patented solution, allowing the system to track a user within a particular space that can be made safe for play and allowing the system to notify the user when he or she is straying outside of the safety of the playfield, as well as being instrumental in other

core features, such as scaling to the virtual world for individual or multi-user gameplay, and location-based game actions that include reference to real-world boundaries. The detailed information about the playfield and its boundary is the "primary information structure for the game" and its use runs throughout the claims and specification. *Sequoia Tech., LLC v. Dell, Inc.*, 66 F.4th 1317, 1326 (Fed. Cir. 2023) (citing *Kaken Pharm. Co. v. Iancu*, 952 F.3d 1346, 1352 (Fed. Cir. 2020) ("A patent's statement of the described invention's purpose informs the proper construction of claim terms….")); *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1308 (Fed. Cir. 2007) ("When a patent . . . describes the features of the 'present invention' as a whole, this description limits the scope of the invention.").

This definition also tracks other discussion of the physical playfield in the specification beyond what is described above. For example, the physical playfield is described as being "constructed" so that it can be scanned, *e.g.*, "FIG. 13 is an illustration of pre-scanning ***a physical playfield constructed in accordance with the principles of the present invention***":

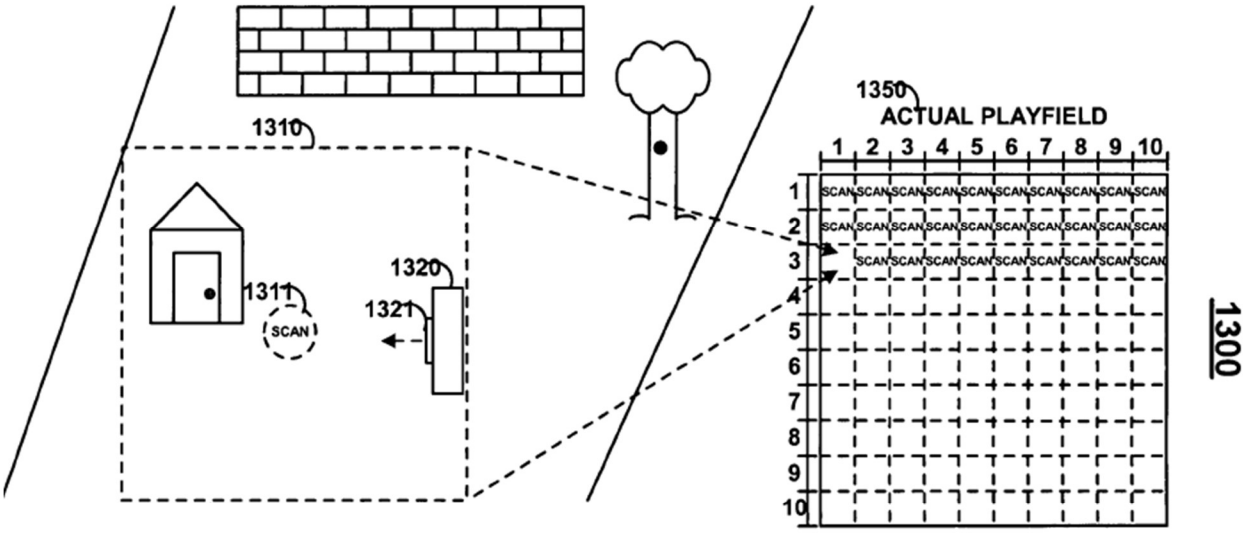


FIG. 13

Ex. 1001, 6:50-53, Fig. 13. Figure 3 similarly describes the process of "scaling a virtual playfield to ***a physical playfield constructed in accordance with the principles of the present invention***." *Id.*, 6:15-17.

Moreover, additional context within the claim language indicates the claimed physical playfield is bounded. Both challenged independent claims require "a locating device that determines the physical location of said locating device ***on*** the physical playfield." The fact that the claims refer to a location ***on*** the physical playfield implies that there is some space in the world that is ***off*** the physical playfield. The whole, unbounded world therefore cannot be the claimed physical playfield as Petitioner's invalidity arguments incorrectly imply.

Dictionary definitions also support Patent Owner's construction. For example, Merriam-Webster's Collegiate Dictionary defines "playing field" as "a field for various games; *esp* the part of a field officially ***marked off for play***." Ex. 2001, p.3. Similarly, The Chambers Dictionary defines "playing field" as "a grass-covered space ***set apart, marked out***, and kept in order for games." Ex. 2002, p.3. The Dictionary of Architecture & Construction defines "playfield" as "[a]n area ***designed*** for field games." Ex. 2003, p.3. Similarly, Webster's Third New International Dictionary defines "playfield" as "a playground ***designed*** for outdoor athletics and games." Ex. 2004, p.3.

The Petition cites to the phrase "the physical world, a physical environment, or a defined physical playfield" to imply that the playfield may be unbounded, *i.e.*, the entire physical world. Pet., 14. Petitioner is incorrect. The distinction drawn in the examples cited above is not that some are bounded and some are not, as the Petition implies. The distinction is that some are in the physical world (*e.g.*, marked pieces of land such as a backyard) and some are defined playfields (*e.g.*, a playmat). A playmat is defined in that without user or system action, it has a specific dimension or occupied area. It may contain, for example, predefined "knowledge of the origin location (e.g., the 'START location')" and an "'END' location" for playing a game. Ex. 1001, 2:64-3:3, 3:24-26, 9:28-34. Further, a defined playfield, such as a playmat "may be representative of [a] single game" and "playmats may be distributed with

game system 101 in kits." Ex. 1001, 2:40-44, 9:1-2. In such a case, the playmat "may include indicia similar to environment indicia in a particular game"; "[f]or example, if a game on game system 101 has a water component and a land component, playmat 1450 may have indicia of a water component (e.g., indicia 152) and land component (e.g., indicia 151)." *Id.*, 8:55-62. Further, it "may be sized according to the characteristics of a game"; for example, "if a user has to move 5 feet to cross the land component on a level of a game provided by game system 101 then the land component of playmat 150 may be 5 feet long." *Id.*, 8:56-67. For example, the patent depicts playmat 150 in Figure 1, with some of the described features that make it a "defined" physical playfield, such as start 170, land indicia 151, water indicia 152, and end 160:

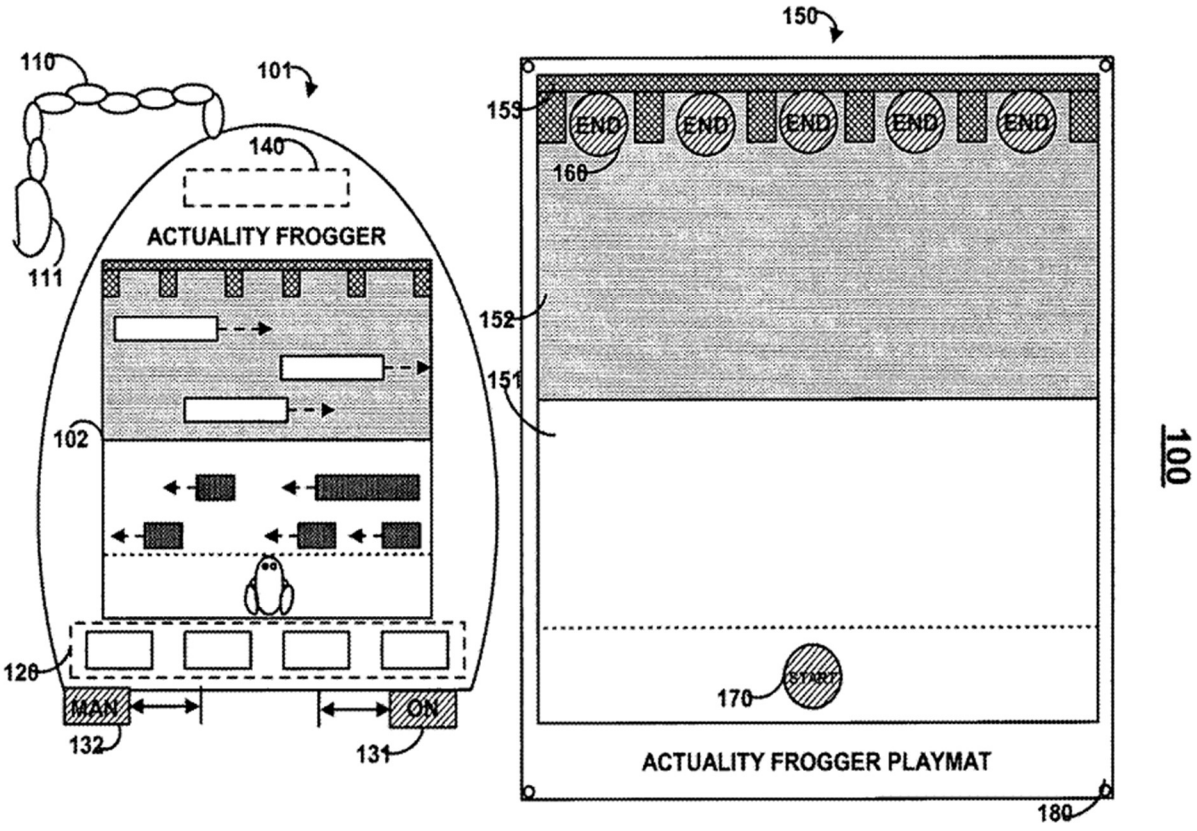


FIG. 1

Id., FIG. 1, 8:58-62.

Likewise, the playfields in the "physical world" and "physical environment" examples in the quotation the Petition relies on have boundaries, albeit other methods are used to determine the boundaries and relevant parts of the playing space that will be important for the game. For example, "the landscape of a pre-determined area (*e.g.*, a particular square area of a military based) may be scanned at a point before a game is played. Virtual objects may be generated using this scanned information that corresponds to physical objects. Such a process may be utilized

when the landscape is being scanned as a game is playing." *Id*., 5:30-36. In other embodiments, a user must manually enter environmental data. *Id*., 20:33-63.

Patent Owner reserves the right to identify additional terms needing construction should the Board grant institution.

V. The Petition

The Petition relies exclusively on prior art that uses only the prior-art approach and does not disclose the patented invention. The asserted grounds are below:

Ground	Claims	Basis for Challenge under §103
1	1, 20	Jaszlics in view of Sofer and Ronzani
2	12, 17	**Ground 1** Prior Art + Rallison

Pet., 3. Only Ground 1 regards the sole challenged independent claim, claim 1, and will be focused on below. Ground 2 merely tacks on a reference for the purposes of dependent claims but does not alter anything about the analysis of claim 1 and so it fails to disclose the elements of claim 1 and fail for the same reasons Ground 1 does.

A. Jaszlics

Jaszlics describes a system using "virtual masking objects" derived from range data to better "combin[e] virtual images with real-world scenes," using stationary, non-wearable "virtual masking object (VMO) generation software running in a virtual simulation computer 210 (e.g., a personal workstation running two 266 MHZ Pentium II processors)." Ex. 1003, Title, 14:14-18.

However, Jaszlics fails to disclose a physical playfield. There is no description of any boundary of a physical area to be used for any reason in Jaszlics. Instead, the system is intended to operate in unbounded space, allowing the user to go wherever he or she wants, without any restriction, and there is nothing in Jaszlics that warns the user when he or she is nearing any boundary, or otherwise uses physical boundary information. Further, as the user moves, the system operates on whatever the scanner can see, thus confirming the use of the system is not restricted to any area: "A range scanner determines the shape and distance of real-world objects within a field of interest to the observer using the apparatus." Ex. 1003, Abstract; *id.*, 2:21-27, 2:39-44, 5:14-18 ("For dynamic scenes with a moving observation point and mobile elements within the real-world scene, the system will normally require considerably higher range scanning pulse rates, such as 30 KHz, and a range frame update rate for the field of regard in the order of 1 Hz or higher."), 11:30-47 ("Changes in the position and orientation of the observer, of a vehicle housing the observer, or of movable elements of the vehicle (e.g. a tank's turret) as sensed by the observer's sensors and controls are processed by the observer state and action processing step . . . Changes in the head position of the observer in some implementations of the invention will control the optical axes of the video camera and range scanner, to ensure that scanning and real-world scene acquisition coincides with the observer's current field of view."), 4:35-40 ("range scanner 101

determines the distance of the entities present in a real-world scene 102 . . . seen from a momentary observation point."), 10:29-31("[t]he observer's interactions with the real world also include the movement of the observation point."), 6:45-46 ("the origin of the coordinate system [is] located at the observation point of the user."), 9:23-24 ("The observer 146 using the optical device will see the virtual image over the whole field of view of the real-world image.").

The Petition argues Jaszlics teaches the claimed physical playfield by teaching "that the electronic display goggles/visors are used to display, for example, virtual tanks and other virtual objects ('3-D video game indicia') overlaid within **a physical landscape surrounding the user**." Pet., 15. However, the amorphous "real-world scene . . . seen from a momentary observation point" surrounding the user as they move is not a bounded space and is therefore not a physical playfield. Ex. 1003, 4:36-40. The Petition then copies this image from Jaszlics confirming this:

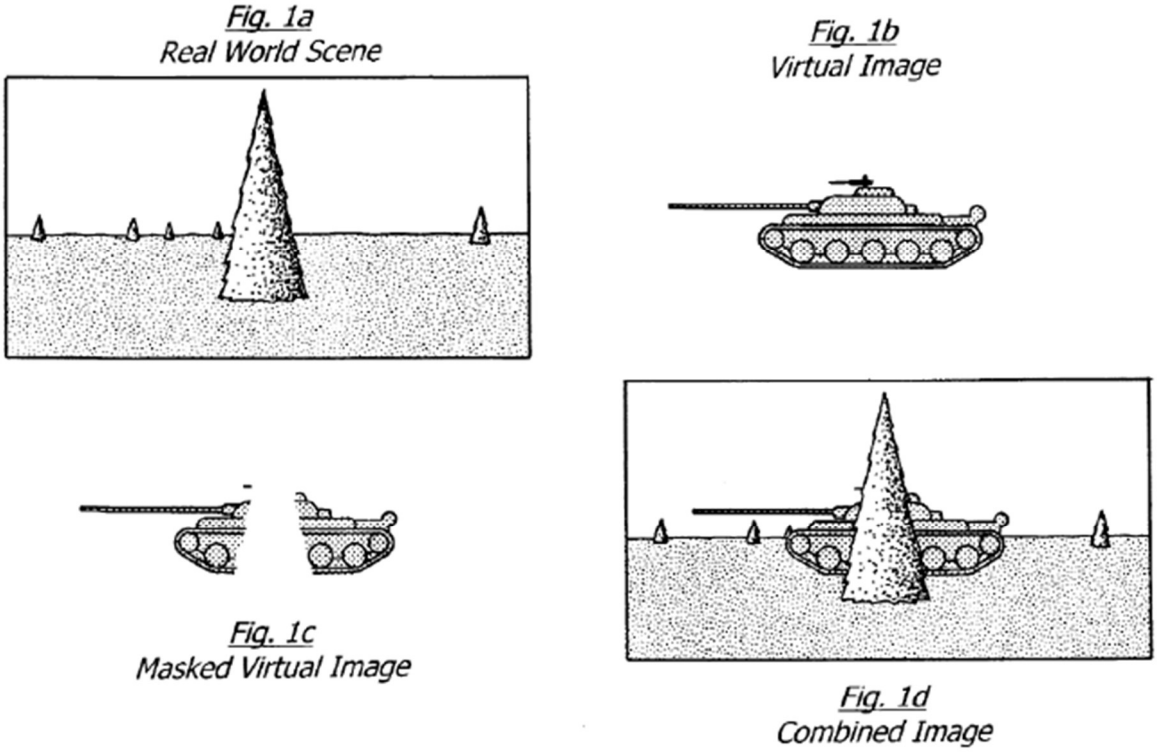


Fig. 1

Ex. 1003, Fig. 1. Thus, as made clear from the reference and the Petition's characterization of it, there is no physical playfield. The device is intended to be used in unbounded space and the system processes whatever the user can see, wherever the user may go.

Moreover, Jaszlics expressly states that the user is intended to move during the game, further emphasizing that the playing space is unbounded. *Id.*, 10:29-31 ("[t]he observer's interactions with the real world also include the movement of the observation point"); *see also* 6:45-46 ("the origin of the coordinate system [is] located at the observation point of the user").

It is worth noting that although Jaszlics mentions that "virtual players, objects, and special effects can be combined with real players and real objects in the playing field," *Id.*, 1:64-67, as noted above, the play space in Jaszlics is not a bounded space. The term "playing field" is only mentioned a single time in the reference and, read in the context of Jaszlics, it merely means the playing "field of view" or "field of regard" that is unbounded because Jaszlics expressly states it changes as the user moves and encompasses whatever the scanner at the user's location can see, wherever the user goes, and further, Jaszlics fails to teach or enable any mechanism whereby its system could establish boundaries for play. *Id.*, 1:22, 2:25-26, 2:43, 3:37, 4:41, 4:67, 5:10-11, 5:17-18, 5:30, 7:53, 8:61-62, 9:24, 9:55, 11:47, 17:22, 18:9, 18:22, 18:32; *id.*, Table 7; *id.*, Claims 1-6, 8, 12-18, 20, 22, 24, 26, 28.

Without constructing such a bounded physical playing space, the system of Jaszlics fails to ensure user safety and would be unable to accomplish any of the functionality reliant on the physical playfield in the '493 patent, including in the claims as described above, and falls squarely into the prior-art approach of an unbounded playing space.

Thus, Jaszlics simply combines virtual images with real-world scenes, without providing any teaching of a system that constructs or uses a physical playfield, making the system of Jaszlics incapable of addressing safety concerns and mobility

constraints of traditional VR systems described in the ’493 Patent and achieving the claimed solution.

B. Sofer

Sofer is titled “Method and Apparatus for a Multisensor Imaging and Scene Interpretation System to Aid the Visually Impaired.” Ex. 1008, Title. As the title suggests, Sofer discloses a wearable system designed to assist blind or visually impaired individuals “avoid objects in the field of vision surroundings . . . [by] processing the image information and audibly describing to the person the objects in the field of vision.” *Id.*, p.5. The sensors of the system of Sofer include a “3D imager 208 [that] emits sequences of laser beams 204 and measures the time of arrival of the return beams 203 in order to compute the distance to the point on the surface of any object in the field of vision.” *Id.*, p.7.

The system of Sofer is explicitly designed for short-range, pedestrian-scale use, stating that “[o]bject identification and description is provided for ***a range up to 20 meters***.” *Id.*, p.6. This limited range is consistent with the system’s intended use case: “to aid in negotiating spaces where one’s view is partially or completely obstructed.” *Id.*, p.1. More specifically, Sofer describes the range as: “The height 112 of field of vision 110 is seen to be 3 meters and the width 114 at the far end is 7 meters at a depth 116 that is also 7 meters, but is no closer than a minimum depth 116.” *Id.*, p.7.

The system of Sofer does not use the disclosed object detection to provide the user with any virtual images because the user of the system is blind. Rather, the system processes the information and provides the user with "[a] continuous verbal scene description . . . according to the relevance and level of threat." *Id.*, p.6.

In summary, Sofer discloses short-range system tailored for providing audio-based assistance to visually impaired users navigating their immediate environments, making it well-suited for pedestrian use but not for applications requiring long-range environmental awareness. *Id.*, p.6 ("a range up to 20 meters").

C. Ronzani

Ronzani describes a head-mounted display (HMD) system that is built around video-based display technology. Ronzani describes a head-mounted display that can play a video from a "video source," such as a camera, through a monocular or binocular screen. Ex. 1009, ¶¶0002, 0006, 0009, 0093. Similarly, Ronzani discloses that "video signal source are provided to a video interface" and that "if discrete color (e.g., RGB) signals are not supplied by the video source (e.g., NTSC composite video signal), then a single encoded video signal 2341 must be supplied by the video source." Ex. 1009, ¶0251.

VI. Board Should Deny Institution Because The Petition Does Not Establish The Required Reasonable Likelihood of Success

This preliminary response presents three main reasons the grounds fail. All focus on the sole challenged independent claim 1, and Ground 1. Ground 2 simply adds a reference to the Ground 1 combination in an attempt to address dependent claims 12 and 17, and does nothing to change or add to the independent claim analysis, as explained below, and so they fail for the same reasons as Ground 1:

Ground	Claims	Basis for Challenge under §103
1	1, 20	Jaszlics in view of Sofer and Ronzani
2	12, 17	**Ground 1** Prior Art + Rallison

Pet., 3.

The first reason the Petition fails is that, Ground 1 fails to disclose or render obvious a "physical playfield," the second reason is that Ground 1 fails to disclose or render obvious "a detector that is operable to be head-worn, wherein said detector is operable to determine landscape characteristics of said physical playfield," and the third reason is that Ground 1 fails to disclose or render obvious a "portable device" that includes "a device for updating the physical location of said device on said physical playfield." Thus, for each challenged claim, there are at least three reasons why all grounds fail. The Petition should therefore be denied.

A. The Grounds Fail To Disclose A "Physical Playfield" (Claim 1)

1. Ground 1

As discussed above in Section V, Jaszlics, the only reference relied upon for the requirement of a physical playfield, does not disclose or suggest a physical playfield as claimed. Thus, Ground 1 fails.

2. Ground 2

In Ground 2, Petitioner adds Rallison to "Ground 1 Prior Art" to attempt to address dependent claims 12 and 17 but does not use Rallison for any element of claim 1, including the "physical playfield." Pet., 9-10, 49-58. Thus, Ground 2 fails for the same reasons as Ground 1.

B. The Grounds Fail To Disclose "A Detector That Is Operable To Be Head-Worn, Wherein Said Detector Is Operable To Determine Landscape Characteristics Of Said Physical Playfield, Wherein Said Landscape Characteristics Are Utilized By Said Location-Based Video Game" (Claim 1)

1. Ground 1

The Petition relies on Jaszlics, and alternatively Jaszlics supplemented by Sofer, to teach the claim limitation a "detector that is operable to be head-worn, wherein said detector is operable to determine landscape characteristics of said physical playfield, wherein said landscape characteristics are utilized by said location-based video game," under a first theory that the alleged range scanner of Jaszlics and/or Sofer satisfy the claimed head-worn detector. Pet., 21-32.

Petitioner also relies on a second theory under which Jaszlics, and alternatively Jaszlics supplemented by Ronzani or Sofer, disclose a head-worn camera that allegedly constitutes the claimed head-worn detector. Pet., 33-39.

But Jaszlics's range scanner and camera are not worn on the user's head, but rather are located in a vehicle or otherwise provided separately from the displays of the system and connected by a variety of cables, as explained below, and there is no motivation to move the hardware to the user's head, either based on Jaszlics alone or based on Sofer or Ronzani, respectively. Thus, the Petition fails in all grounds to render obvious claim 1 and thus all claims. Ground 2 merely refers to Ground 1 for this limitation and thus fails for the same reasons.

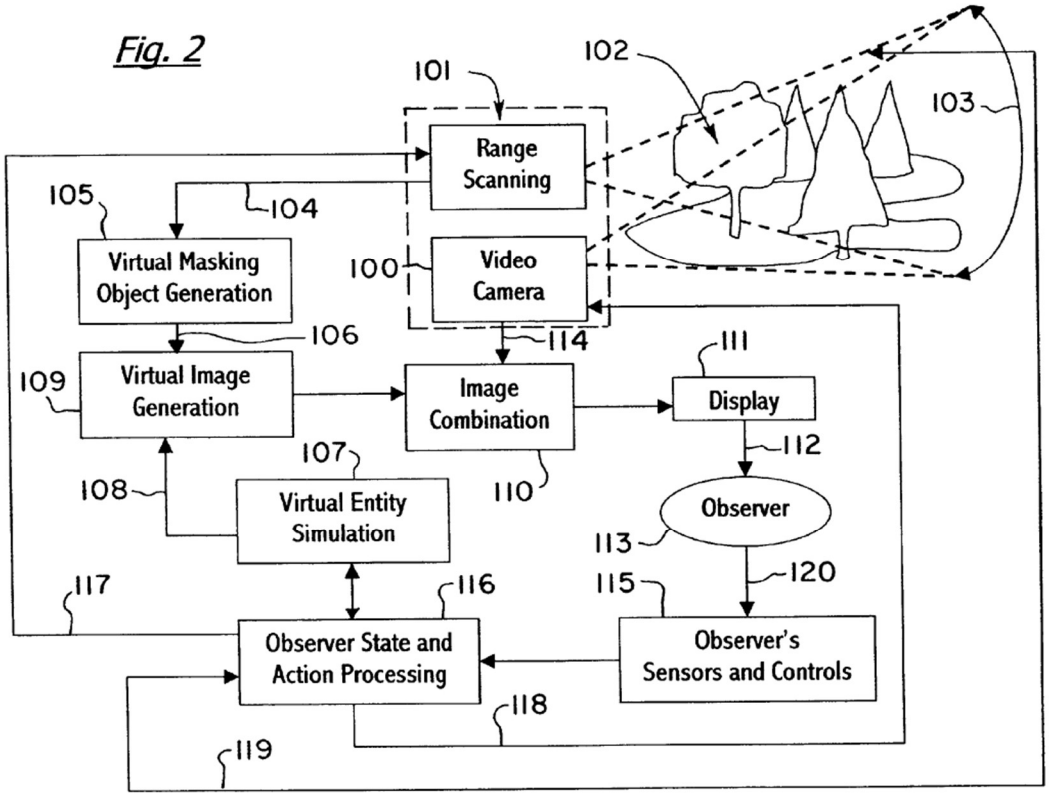
a. Jaszlics Fails To Disclose Or Render Obvious "A Detector That Is Operable To Be Head-Worn, Wherein Said Detector Is Operable To Determine Landscape Characteristics Of Said Physical Playfield, Wherein Said Landscape Characteristics Are Utilized By Said Location-Based Video Game" (Claim 1)

The Petition relies on Jaszlics as to the claim limitation "a detector that is operable to be head-worn, wherein said detector is operable to determine landscape characteristics of said physical playfield, wherein said landscape characteristics are utilized by said location-based video game." Pet., 21. Specifically, Petitioner provides two separate mappings to Jaszlics for the aforementioned limitation: (a) a mapping where the "'detector' is a range scanner" (Pet., 21-32), and (b) a mapping

where the "'detector' is a camera" (Pet., 33-39). As explained below, regardless of the mapping, Jaszlics fails to disclose or render obvious the required limitation.

i. Jaszlics Fails To Disclose Or Render Obvious "A Detector That Is Operable To Be Head-Worn" Where The Detector Includes A Range Scanner (Petitioner's First Theory)

In its first argument, Petitioner asserts that "Jaszlics discloses and renders obvious 'a detector that is operable to be head-worn, wherein said detector is operable to determine landscape characteristics of said physical playfield' in the form of a range scanner." Pet., 21. However, the alleged range scanner in Jaszlics is not head-worn, as claimed, nor is there reason for it to be. As shown in Figure 2 of Jaszlics, "[t]he display 111 may be . . . an electronic goggle or visor," which is separate from item 101, the alleged range scanner 101:



Ex. 1003, 9:34-36, Fig. 2. The range scanning information is used by the virtual masking object generation 105 and the virtual image generation step 109, which then feeds data via a "VGA/SVGA computer display cable" (*Id.,* 14:56-59) to the image combination step 110, which is implemented using a "DeltaScan Pro GL" unit, which then finally sends the image to the goggles or visor, *i.e.*, display 111. *Id.*, 5:26-53, 8:32-9:57. The below image of a DeltaScan Pro GL depicts the image combination 110 hardware that sits ***between*** both the range scanner and the camera, on one hand and the "display 111" (goggles / visor), on the other further confirming neither the range scanner nor the camera is worn on the head:

Ex. 2007.

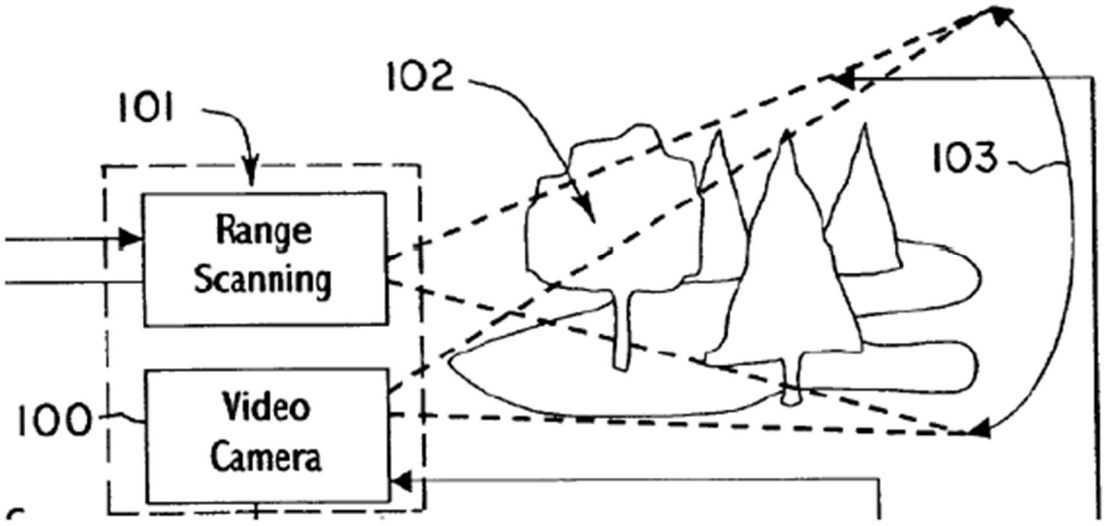
Moreover, the range scanner in Jaszlics is described as a "commercially available solid-state infrared surveyor's ranging laser," which is explicitly designed for "long ranges of several hundred meters to multiple kilometers." Ex. 1003, 12:19-20, 6:61. An example of such a ranging laser is depicted below:

There is no disclosure provided in Jaszlics that would indicate that such a commercially-available, high-power "surveyor's ranging laser" could be head-worn or that there is a motivation for it to be.

Petitioner also argues that "Jaszlics further suggests that the range scanner is mounted on the user's head, explaining that '[c]hanges in the head position of the observer in some implementations of the invention will control the optical axes of the video camera and range scanner, to ensure that scanning and real-world scene acquisition coincides with the observer's current field of view.'" Pet., 28 (citing Ex. 1003, 11:43-47). Petitioner goes on to argue that "[t]he close coupling of a user's field of view and the range scanner is shown in Figure 2 of Jaszlics, which illustrates a range scanner (101) placed in proximity to the user's vantage point captured by a

video camera (100) . . . suggests . . . that the range scanner would have been 'head-worn' as a part of an electronic goggles/visor head-mounted device." *Id.*, 28-29.

But that is incorrect for several reasons. First, the Petition is incorrect that Figure 2 shows a "close coupling" of the user's field of view and the range scanner (such that it would justify moving the hardware of the range scanner onto the user's head):



Pet., 29; Ex. 1003, Fig. 2 (partial). Instead, whatever alleged close coupling exists would be, if anything, between the range scanner 101 and the video camera 100. But as explained above, the video camera, like the range scanner, is not worn on the user's head; it is part of the infrastructure of the system, for example in the main embodiment, which is a tank. Ex. 1003, 10:19-23 ("the observer (the battle tank's gunner or commander) would observe . . . the real-world scene through the tank's actual gun sight."), 11:24-30 ("when the magnification level of the simulated gun

sight is changed by the observer, the video camera's 100 zoom level is changed through the observer state and action processing software, by sending a control signal 118 to the camera's electronic control board, which in turn changes the zoom lens position."). The fact that a user's head movement may "control the optical axes," as the Petition alleges, does not mean such commercially-available, high performance equipment is worn on the head. It is not said to be worn on the head in Jaszlics and the Petition has not shown it to be. Pet., 28. In fact, Jaszlics explains that in order for head movement to "control the optical axes," the camera, like the range scanner, is ***not*** worn on the head, when it states that "[t]he position and orientation of the observer (including the movement and attitude of the vehicle, if any, housing the observer) is sensed by observer sensors and controls 115 such as *a magnetic or infrared head tracker system* used in conjunction with virtual reality goggles." Ex. 1003, 10:52-57. Thus, there is a head tracking system that sends signals to control the axes of the video camera and range scanner—they are explicitly not worn on the head. If the camera and range scanner were worn on the head, they would be moved directly by head movement, not by a head tracking system that relays head position.

Further, Jaszlics states that the "[t]he video camera is a commercially available remote-control camera. The video camera can be moved in pitch and yaw (pan motion) . . . These functions are activated by the digital control signals sent to

the camera's internal control board through an RS-232 camera control cable 202." Ex. 1003, 12:3-9. This demonstrates that the video camera 100 is not a part of any head-worn device. If it were, there would be no need for the remote-controlled camera, connected through an RS-232 camera control cable described above to adjust pitch and yaw. Rather, the camera would simply be provided on the user and arranged to capture what the user is looking at.

Thus, the alleged motivation—to move the range scanner to the head because the camera is there—fails, because the camera is not on the head-mounted device. And as stated above, the detector must be part of the head-mounted device, and so the Petition's alternative theories regarding a range scanner "in close proximity" to the user does not satisfy the claims.

Moreover, even if the camera were head-worn, the range scanner can scan "several hundred meters to multiple kilometers." *Id.*, 6:61. There is no need for such tight integration with a user's live head movement when the scanner works over multiple kilometers, a long distance to see, especially with the alleged goggles or visor partially obscuring vision. This is especially true because there are significant disadvantages to each piece of equipment that a system design physically burdens the user with, especially head-worn equipment, increasing strain on the neck and adding error-prone hardware to a precarious location, and especially in the context of a war game simulation for soldiers. These are undoubtedly reasons why the

equipment worn by the user in Jaszlics is minimal, and the Petition fails to rationalize in a way that overcomes these substantial drawbacks.

ii. Jaszlics Fails To Disclose Or Render Obvious "A Detector That Is Operable To Be Head-Worn" Where The Detector Includes A Camera (Petitioner's Second Theory)

In its second argument, Petitioner alternatively asserts that "Jaszlics discloses that range scanning can be performed with a camera," pointing to the "active flash ranging methods" and "passive ranging methods" described in Jaszlics and arguing that the "coaxial CCD matrix cameras" used are sufficient to disclose or renders obvious a "detector that is operable to be head-worn, wherein said detector is operable to determine landscape characteristics of said physical playfield." Pet., 33-34 (citing Ex. 1003, 4:43-46, 4:60-5:6, 18:20-31). However, as with the first theory regarding Jaszlics and the alleged head-mounted range scanner, the camera in Jaszlics is not head-mounted and there is no reason for it to be, and substantial reason for it not to be.

As discussed above in Section VI.B.1.a.i, there is no disclosure provided in Jaszlics that the video camera is worn on the user's head. Rather, the video cameras are described as part of the infrastructure of the system.

In particular, nowhere in Jaszlics are the "coaxial CCD matrix cameras" said to be worn on the head in and the Petition has not shown them to be. Pet., 33-34. In

fact, as mentioned above, Jaszlics explains that in order for head movement to "control the optical axes," as relied upon, Pet., 34, the cameras are ***not*** worn on the head, when it states that "[t]he position and orientation of the observer (including the movement and attitude of the vehicle, if any, housing the observer) is sensed by observer sensors and controls 115 such as *a magnetic or infrared head tracker system* used in conjunction with virtual reality goggles." Ex. 1003, 10:52-57. Thus, as explained above, the magnetic or infrared head tracker system is used to control the camera axes, making clear that the camera is not head-worn, because otherwise head movement would directly move the camera.

Moreover, the cameras used in the passive ranging methods described in Jaszlics are explicitly disclosed as being "coaxial CCD matrix cameras." Ex. 1003, 18:34-36. An example of such a CCD matrix camera is depicted below:

Ex. 2009.

There is no disclosure provided in Jaszlics that would indicate that such a CCD matrix camera—***let alone that the required two "coaxial CCD matrix cameras"*** (Pet., 33)—could be head-worn or that there is a motivation for them to be. Changing the system of Jazlics to place not only one, but two of the CCD matrix cameras shown above on the observer's head would have significant disadvantages, such as increasing strain on the neck of the observer, which is a physical burden, especially in the context of a war game simulation for soldiers. These are undoubtedly reasons why the equipment worn by the user in Jaszlics is minimal and the Petition fails to rationalize in a way that overcomes these substantial drawbacks.

b. There Is No Motivation to Combine Jaszlics and Sofer For the First Theory (Range Scanner)

To attempt to remedy the deficiencies of Jaszlics with regard to the first theory, mapping where the "'detector' is a range scanner" (Pet., 21-32), as discussed above in Section VI.B.1.a, Petitioner argues that "[i]t would have been obvious to combine Sofer's teachings regarding a head-mounted range scanner with Jaszlics' combined reality computing system." Pet., 30. As to the specific modification, the Petition states: "[t]he combination involved the incorporation of Sofer's range scanning techniques, with no change in function, into Jaszlics' system utilizing a head-mounted device." Pet., 30. But this argument fails for several reasons.

The Petition argues that "a person of ordinary skill in the art would have appreciated that it would be desirable for Jaszlics' range scanner to be placed in close proximity to the user's vantage point, and in fact Jaszlics teaches such an arrangement." Pet., 32. However, as discussed above in Section VI.B.1.a, there is no reason to move the range scanner of Jaszlics to the goggles/visor, as the camera is not located there, and there are substantial downsides to adding equipment to the user's head-worn device.

The Petition further argues that "a person of ordinary skill in the art . . . would have been motivated to investigate potential ways in which range scanning could be implemented for a mobile individual—and would have recognized that a head-worn

range scanner would have been obvious to try. (Cooperstock, ¶99.) A person of ordinary skill in the art would have therefore looked to a reference like Sofer for its disclosures confirming and describing an implementation of a lightweight, head-worn range scanning device for a mobile individual." Pet., 32. This argument is unsupported and speculative.

Sofer's head-worn range scanner is insufficient for and indeed completely incompatible with Jaszlics's long-range scanning needs and a POSITA would not use it in Jaszlics. Jaszlics requires a "commercially available solid-state infrared surveyor's ranging laser," designed for "long ranges of several hundred meters to multiple kilometers" to accurately recreate large-scale war environments. Ex. 1003, 12:19-20, 6:61; *see also id.*, 1:53-55 ("The present invention can be used in . . . war games to generate virtual tanks that appear to move about the terrain.").

By contrast, the system of Sofer is explicitly designed to use a "lightweight" (in the Petition's words, Pet., 32; *see also* Ex. 1008, p.5 ("The system of the present invention is compact and light weight.")) for short-range, pedestrian-scale use, describing "[o]bject identification and description . . . for a range ***up to 20 meters.***" Ex. 1008, p.6. More specifically, Sofer describes the field of view of the system as having a "height 112 . . .[of] 3 meters and the width 114 at the far end is 7 meters at a depth 116 that is also 7 meters, but is no closer than a minimum depth 116." *Id.*, p.7.

Thus, modifying the system of Jazslics to "combine Sofer's teachings regarding a head-mounted range scanner with Jaszlics' combined reality computing system," as asserted in the Petition, would result in a system that is completely incapable of providing, for example "war games [in which] virtual tanks . . . appear to move about the terrain." Pet., 30; Ex. 1003, 1:53-55. Specifically, the Petitioner has failed to articulate how something like a virtual tank moving about the terrain (*e.g.*, behind a grassy knoll 45 meters away from the observer, Ex. 1003, 6:42-53) could be provided to the observer, when Sofer's imager only has a range of 20 meters, or a field of view of 3 meters by 7 meters by 7 meters. Ex. 1008, p.6-7.

The Petition argues that "Jaszlics further describes how its system can be used by an individual mobile user." Pet., 32. If the implication is that the user wears all the equipment needed for the system, that is flatly incorrect. At best Jaszlics describes a user that wears goggles or a visor. None of the other equipment is described as body-worn—let alone head-worn.

The systems are incompatible and fundamentally different for additional reasons as well. Jaszlics's system relies on real-world video feeds and range data to provide observers with combined reality scenes for simulation purposes. Ex. 1003, 8:53-56 ("[V]irtual images constructed in the virtual image generation step 109 are combined with the real-world image 114 originating from the video camera 100."), 9:23-24 ("The observer 146 using the optical device will see the virtual image over

the whole field of view of the real-world image."). But Sofer is entirely designed to help blind or visually impaired individuals "avoid objects in the field of vision surroundings . . . [by] processing the image information and audibly describing to the person the objects in the field of vision." Ex. 1008, p.5. To achieve this, the system of Sofer includes a "3D imager 208 [that] emits sequences of laser beams 204 and measures the time of arrival of the return beams 203 in order to compute the distance to the point on the surface of any object in the field of vision." *Id.*, p.7. Thus, Sofer is not designed to provide any combined reality outputs whatsoever. That is, there is no image combination in Sofer; the user is blind or visually impaired, and is simply provided with audible descriptions of the user's field of view. *Id.*, p.5. The references are also thus drawn to completely different fields and problems—augmented reality war game simulations and audible image recognition for blind people—and are not analogous references; a POSITA would simply not look to Sofer to improve Jaszlics's war-games augmented reality system.

The Petition makes no attempt to reconcile these differences or explain how the imager of Sofer would work in the image combination-based system of Jaszlics or what modifications would be needed to combine the systems or any aspects of them. Pet., 27-32. The references are fundamentally incompatible in terms of their technology, and there is no attempt in the Petition to explain how or why one would cobble together a system with both, or use aspects of Sofer in Jaszlics, and how the

system would need to be modified to function, let alone to function up to the standards required in Jaszlics.

Moreover, Jaszlics discloses a complete and functioning system in which a "commercially available solid-state infrared surveyor's ranging laser," (Ex. 1003, 12:19-20) with long range scanning capabilities up to "multiple kilometers," (*id.*, 6:64) is used to enable combination of virtual images with real-world scenes. *Id.*, Title. There is no suggestion in Jaszlics that the goggles or visor, or the range scanner, are deficient or in need of enhancement. Petitioner fails to identify any problem in Jaszlics that would have led a POSITA to seek out Sofer's teachings. The mere fact that Sofer describes a wearable system with a "3D imager 208" (Ex. 1008, p.7) to assist blind or visually impaired individuals by "audibly describing to the person the objects in the field of vision," (*id.*, p.5) is totally unrelated to Jaszlics and, does not, without more, justify modifying Jaszlics's architecture, which would be a wholesale redesign of the system. The Petition does not explain why a POSITA would have deviated from Jaszlics's robust range scanning capabilities, which is consistent with the system's use of external range scanners, to instead use the short-range imager of Sofer.

Jaszlics already achieves its stated goals—"[to] completely eliminate the need, for example, for live tanks representing the enemy force in a war gaming exercise"—using a "commercially available solid-state infrared surveyor's ranging

laser." Ex. 1003, 1:55-57, 12:19-20. Sofer's imager is provided "for the purpose of audibly describing the objects to the person in the field of vision." Ex. 1008, p.5. Petitioner does not explain how incorporating Sofer's imager into Jaszlics's goggles would enhance the system's performance, improve mobility, or otherwise yield a benefit. Indeed, replacing the range scanner of Jaszlics with the imager of Sofer as alleged by the Petition, would have substantial drawbacks and would require large-scale redesign of the system, for no benefit, as discussed in greater detail above.

Without a clearly articulated improvement, the proposed combination amounts to impermissible hindsight reconstruction. *See Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) ("a patent . . . is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art . . . it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does."). Accordingly, Petitioner has failed to articulate a reasoned motivation to combine the references as required under *KSR Int'l Co. v. Teleflex Inc. See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

c. There Is No Motivation to Combine Jaszlics And Ronzani Or Jaszlics And Sofer For The Second Theory (Camera)

Alternatively, to attempt to remedy the deficiencies in Jaszlics with regard to the second theory, the mapping where the "'detector' is a camera" (Pet., 33-39), as

discussed above in Section VI.B.1a.ii, Petitioner argues that "[i]t would have been obvious to a person of ordinary skill in the art to combine Ronzani's teachings regarding a head-mounted camera that is part of a head-mounted display device with Jaszlics' combined reality system involving a user wearing electronic goggles/visor." Pet., 36. As to the specific modification, the Petition states: "[t]he combination would have involved the straightforward addition of one or more cameras to Jaszlics' electronic goggles/visor." Pet., 36-37. This argument is not only unsupported and speculative, but it completely mischaracterizes the teachings of Ronzani.

The proposed combination would not function because there would not be the two cameras to provide the required "stereographic or parallax comparison," required by the passive ranging methods described in Jaszlics, which the Petition relies on for motivation to use of cameras as a detector for determining landscape characteristics. Pet., 33; Ex. 1003, 5:4. In the combination, Jaszlics's two camera system, which executes the stereographic or parallax comparison, has been removed, and the only thing used in its place is the single CCD camera 555b of Ronzani, which is incapable of stereographic or parallax comparison. Pet., 35.

As recognized in the Petition, ***Ronzani only describes a single "(CCD) camera 555b."*** Pet., 35-36. Thus, Petitioner's assertion that "[t]he combination would have involved the straightforward addition of ***one or more cameras*** to

Jaszlics' electronic goggles/visor," is a complete mischaracterization of Ronzani. Pet., 36-37. There is absolutely no support in Ronzani for ***"one or more"*** CCD cameras 555b as asserted in the Petition. There is only support for a single camera. Ex. 1009, ¶0154, FIG. 33; Pet., 35-36. Thus, a PHOSITA would never look to Ronzani for any teachings of "[p]assive ranging methods (e.g., stereographic or parallax comparison of real-world scene elements)," as a single camera is completely incapable of providing such functionality. Ex. 1003, 5:3-4.

Specifically, the "[p]assive ranging methods," described in Jaszlics work by leveraging images from ***two*** "coaxial CCD matrix cameras with parallel optical axes separated by a known baseline." Ex. 1003, 18:33-36. In other words, the method does not work with a single camera, as "stereographic or parallax comparison," (Ex. 1003, 5:4) requires two different viewpoints (*e.g.*, "optical axes of Camera 1, and Camera 2," Ex. 1003, 18:44-45) to measure depth—this is a key aspect of parallax and stereographic imaging. Ex. 2010 ("On a pair of photographs . . . parallax is measured by distances on the photographs."), ("[T]he absolute stereoscopic parallax of a point is the algebraic difference of the distances of the two images of the point from their respective photograph nadirs."). On the other hand, as described above, Ronzani describes a head-mounted display that can play a video from a "video source," such as a camera, through a monocular or binocular screen. Ex. 1009, ¶¶0002, 0006, 0009, 0093. The only mention of the "(CCD) camera 555b" in

Ronzani appears in reference to FIG. 33, cited in the Petition. Ex. 1009, ¶0154; Pet., 36.

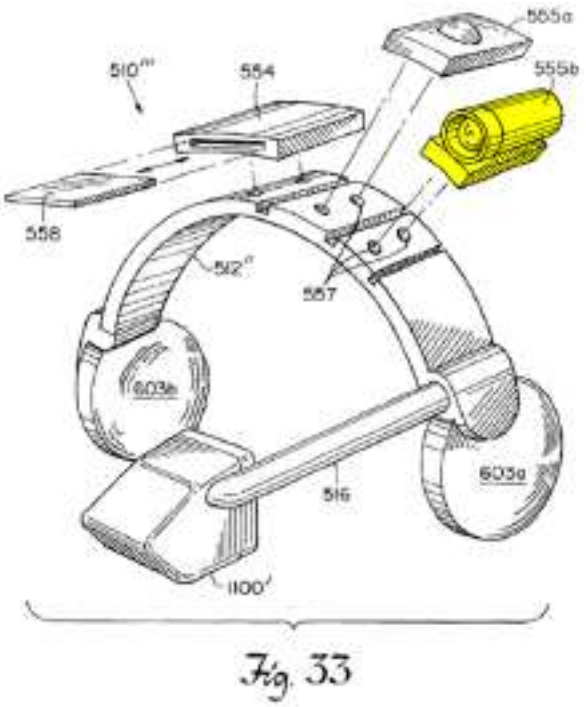


Fig. 33

Ex. 1009, FIG. 33. As shown above, the system of FIG. 33 of Ronzani only includes a single CCD camera 555b. This is because the system of Ronzani is designed for applications such as "commercial audio/video presentations (television, home video), computer and multimedia presentations, hospital operating room use (e.g. orthoscopic surgery), remote camera monitoring, or any other use where private or detailed viewing of a video image is desired." Ex. 1009, ¶0098. But the system is not designed for 3D scene reconstruction or passive ranging, as is the case in Jaszlics.

Thus, a POSITA looking to modify the passive ranging methods of Jaszlics would never look to Ronzani, because the system of Ronzani does not provide any

disclosure of such a functionality. The Ronzani system is fundamentally focused on video presentation, not on "[p]assive ranging . . . [using] stereographic or parallax comparison." Ex. 1003, 5:3-4. The Petition makes no attempt to reconcile these differences or explain how the single camera of Ronzani would be capable of providing the passive ranging required by Jaszlics or what modifications would be needed to combine the systems or any aspects of them. Pet., 33-39. The references are fundamentally incompatible in terms of their technology, and there is no attempt in the Petition to explain how or why one would cobble together a system with both, or use aspects of Ronzani in Jaszlics, and how the system would need to be modified to function, let alone to function as required by Jaszlics.

To the extent the Petition is not relying on the alleged camera-based detection capabilities in Jaszlics in order to motivate using Ronzani's (single) head-mounted camera, and instead simply arguing that because Ronzani has a head-mounted camera, a POSITA would modify Jaszlics to have one, that reasoning fails for the same reasons as the Petition's single-reference obviousness argument fails, and similar reasons why modification with Sofer fails: there is simply no benefit and substantial downside to moving the camera to a head-mounted unit. *See* Sections VI.B.1.a – VI.B.1.b.

Second, in yet another attempt to remedy the deficiencies in Jaszlics with regard to the mapping where the "'detector' is a camera" (Pet., 33-39), as discussed

above in Section VI.B.1.a.ii, Petitioner asserts that Sofer "further confirms the obviousness of a head-worn camera. (Cooperstock, ¶110.) Sofer expressly discloses . . . an exemplary headset that includes two cameras, i.e., (1) camera/CCD sensor 205 and (2) camera/CCD sensor 206." Pet., 38.

The Petition's theory is that because Jaszlics discloses a method of using parallax or stereographic imaging using two cameras, a POSITA would use the two alleged head-mounted cameras of Sofer to do the same thing:

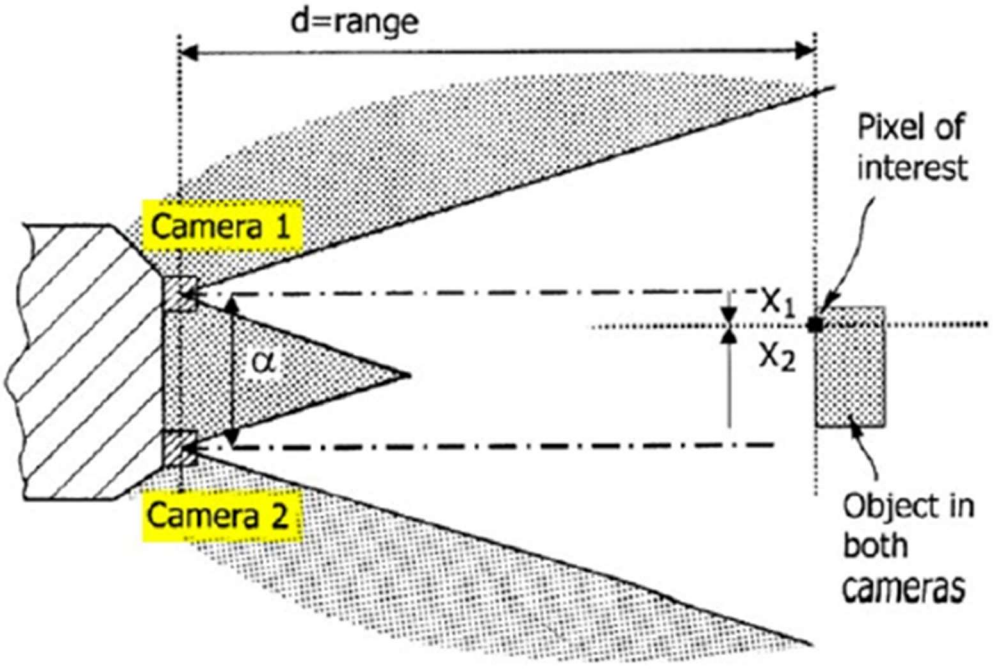


Fig. 24

Pet., 33 (depicting alleged "parallax" imaging in Jaszlics). But the two alleged head-mounted cameras in Sofer (CCD sensor 205 and optional CCD sensor 206) are not used for stereographic or parallax comparison, and thus a POSITA would not look

to Sofer's cameras to modify Jaszlics's functionality. Instead, as discussed above in Section VI.B.1.b, the system of Sofer relies on a "3D imager 208 [that] emits sequences of laser beams 204 and measures the time of arrival of the return beams 203 in order to compute the distance to the point on the surface of any object in the field of vision." Ex. 1008, p.7. The CCD sensor 205 is simply described as "a camera that senses the color . . . of the points on the surfaces of objects," and in an optional configuration, both CCD sensors 205 and 206 are used "to compute the distance to the object's points in addition to their roles as color sensing cameras." *Id.* This optional depth computation is not based on stereographic or parallax principles, but rather on "a structured light grid" projected by the imager 208. *Id.* Like the proposed modification with Ronzani discussed above, the Petition makes no attempt to reconcile these differences or explain why "a [POSITA], seeking to implement or adapt Jaszlics' teachings, would have been motivated" to modify the "active flash ranging methods" or "passive ranging methods" of Jaszlics to include the cameras used in the system of Sofer. Pet., 37; Ex. 1008, p.4. Nor does the Petition make any attempt to explain how such a modification would be capable of providing the scanning ranges required by Jaszlics or what modifications would be needed to combine the systems or any aspects of them. Pet., 38-39. The "structured light grid" approach is an entirely different method from stereographic or parallax imaging and

the Petition simply ignores how the system would be modified to actually function, much less does it provide a reason for doing so.

Moreover, Jaszlics discloses a complete and functioning system in which two "coaxial CCD matrix cameras with parallel optical axes separated by a known baseline," can be used as "[p]assive ranging methods . . . when their angular resolution fits the requirements of a specific application." Ex. 1003, 18:33-36, 5:3-6. There is no suggestion in Jaszlics that the goggles or visor, or coaxial CCD matrix cameras, are deficient or in need of enhancement. Petitioner fails to identify any problem in Jaszlics that would have led a POSITA to seek out Ronzani's teachings or Sofer's teachings. The mere fact that Ronzani describes a wearable system with a single "(CCD) camera 555b" (Ex. 1009, ¶0154) and Sofer describes similar, does not, without more, justify modifying Jaszlics's architecture, which would be a wholesale redesign of the system, not to mention that such a redesign would provide a system that is completely non-functional as described above. The Petition fundamentally fails to describe any benefits to the camera or range scanner being head-worn, which would substantially add to the head burden of the user in Jaszlics without any benefit.

To the extent the Petition marginally references Jaszlics's "active flash ranging methods" as a reason to modify Jaszlics with Sofer, the Petition fails to explain why Sofer's system would work for Jaszlics's purposes. Pet., 33. Indeed, it

would not function at all; the combination alleged in the Petition relies only on the two CCD cameras, and so there is no head-mounted device to perform the required "ranging pulses." Ex. 1003, 18:20-31. Moreover, there is no reason to change Jaszlics's system to be head-mounted for the same reasons as in connection with the first theory regarding the range scanner allegedly as a detector, described in Section VI.B.1.b. Further, Sofer's minimal 20-meter range would be insufficient for the distances needed in the active flash ranging in Jaszlics of 100 meters. Ex. 1003, 18:20-31. As is, Jaszlics describes downsides with its non-head-worn active ranging as being particularly power intensive; this problem only grows worse with a system worn on the head, which necessarily has a smaller battery than one not worn on the head, which would take the active flash ranging method from one that Jaszlics disparages as inferior to one that is non-functional.

The same is true of any marginal allegation regarding Jaszlics being modified with Ronzani based on active flash ranging in Ronzani. Ronzani's alleged camera would not work for that functionality in Jazslics because there is only a camera, and nothing to provide the "ranging pulses" required, nor does the Petition point to anything besides a sole camera in Ronzani. Ex. 1003, 18:20-31; Pet., 35-38.

Thus, the Petition does not explain why a POSITA would have deviated from Jaszlics's ranging capabilities, to instead use the single camera of Ronzani or to use Sofer's scanning methods which have significantly worse ranging capabilities.

2. Ground 2

As explained in Section VI.A.2, Ground 2 adds nothing to the claim 1 analysis and thus fails for the same reasons as Ground 1 fails.

C. The Grounds Fail To Disclose "A Portable Device" That Includes "A Device For Updating The Physical Location Of Said Device On Said Physical Playfield, Wherein The Physical Location Of Said Device Is Utilized By Said Location-Based Video Game" (Claim 1)

1. Ground 1

The Petition relies on Jaszlics, and alternatively Jaszlics supplemented by Ronzani, to teach the claim limitation a "portable device" that includes "a device for updating the physical location of said device on said physical playfield, wherein the physical location of said device is utilized by said location-based video game." Pet., 39. In particular, the Petition argues that the claimed "portable device" is met "in the form of a head-worn display device—such as electronic goggles/visor—worn by a mobile user" in Jaszlics. Pet., 11. The Petition argues that Jaszlics, alone or in combination with Ronzani, renders obvious using a GPS device as the claimed "device for updating the physical location of said device on said physical playfield" within the alleged head-worn display device. Pet., 41 ("Petitioner will turn now to address how Jaszlics, alone or in view Ronzani, renders obvious a '[locating] device' that is head-mounted as a part of the head-worn electronic goggles/visor corresponding to the claimed 'portable device.'"); *id.*, 39-46.

But (1) Jaszlics does not disclose or render obvious such a design, as it does not disclose a GPS device located on the user's head and there is no reason to modify it to do so, and (2) there is no motivation to combine Jaszlics and Ronzani such that a GPS device is worn on the head, and thus the Petition fails in all grounds to render obvious claim 1 and thus all claims. Ground 2 merely refers to Ground 1 for this limitation and so it fails for the same reasons.

a. Jaszlics Fails To Disclose Or Render Obvious "A Portable Device" That Includes "A Device For Updating The Physical Location Of Said Device On Said Physical Playfield, Wherein The Physical Location Of Said Device Is Utilized By Said Location-Based Video Game" (Claim 1)

Jaszlics fails to disclose or render obvious "a portable device" that includes "a device for updating the physical location of said device," as claimed. The Petition argues that while Jaszlics does not disclose such functionality, it renders it obvious because a GPS device would get a better signal if worn on the head. Pet., 43. But this is both speculative and ignores the downsides of burdening a user with additional head-worn hardware. It also ignores the fact that in addition to the fact that Jaszlics does not disclose a head-worn GPS receiver, real-life military systems chose to place GPS receivers on the body, not the head, for many years after Jaszlics and the '493 patent. The image provided below shows a soldier provided with an "EUD" (End User Display), which "provides GPS location data." Ex. 2006, p.10.

Figure 1-2. Nett Warrior Chest Mount

Id., p.10. (Figure 1-2). As seen above, even more than fifteen years after Jaszlics, leading-edge military systems continued to equip soldiers with GPS devices that were not integrated into head-worn gear. This undermines Petitioner's assertion that "the user's head . . . would have been an obvious choice" for placing the GPS device described in Jaszlics. Pet., 43. In reality, such a configuration was not only absent from the state of the art at the time of Jaszlics, but remained contrary to prevailing military design choices well into the future. The Petition therefore fails to establish

any rational underpinning to support a motivation to place the GPS device described in Jaszlics in the goggles/visor described.

b. There Is No Motivation to Combine Jaszlics and Ronzani

To attempt to remedy the deficiencies in Jaszlics, Petitioner argues that "[i]t would have also been obvious to combine Ronzani's teachings regarding a head-mounted GPS receiver with Jaszlics' combined reality computing system." Pet., 45. As to the specific modification, the Petition states: "[t]he combination would have involved no change in function and would have predictably resulted in a head-mounted GPS receiver as a part of the user's electronic goggles/visor." *Id.* But this argument fails for several reasons.

The Petition argues that "a [POSITA] would have appreciated that it would be desirable for Jaszlics' GPS receiver to be placed in close proximity to the user." Pet., 46. However, as discussed above in Section VI.C.1.a, trends in soldier tracking technology long after Jaszlics demonstrate that GPS receivers were preferably placed on the body. This makes perfect sense, because if the GPS device functioned as needed from a technological standpoint, which apparently it did, additional hardware is more conveniently worn on the body than on the head, as the body is more capable of sustaining additional weight than the head and neck are. Moreover, placing hardware on the head exposes it to more potential damage, and requires more

difficult mounting on a helmet, whereas mounting on a vest or similar article of clothing would be easier.

Jaszlics discloses a complete and functioning system in which a GPS can be provided to moving observers. Ex. 1003, 10:63-67. There is no suggestion in Jaszlics GPS system is in need of enhancement. Petitioner fails to identify any problem in Jaszlics that would have led a POSITA to seek out Ronzani's teachings. The mere fact that Ronzani describes a wearable system with a "head-mounted display system" with a GPS (Ex. 1009, Title, ¶0176) does not justify modifying Jaszlics's goggles. The Petition does not explain why a POSITA would have deviated from the state of the art GPS devices described above, especially when Jaszlics is setting out to provide realistic war game exercises. Ex. 1003, 1:53-57.

Without a clearly articulated improvement, the proposed combination amounts to impermissible hindsight reconstruction. *See Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) ("a patent . . . is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art . . . it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does."). Accordingly, Petitioner has failed to articulate a reasoned motivation to combine the references as required under *KSR Int'l Co. v. Teleflex Inc. See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

For the reasons above, Ground 1 fails to disclose all elements of claim 1.

2. Ground 2

As explained in Section VI.A.2, Ground 2 adds nothing to the claim 1 analysis and thus fails for the same reasons as Ground 1 fails.

VII. Conclusion

For the above-described reasons, Patent Owner respectfully requests that the Board deny institution, as all grounds fail to disclose or suggest multiple requirements of independent claim 1 that are also present in the challenged dependent claims.

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Respectfully submitted,

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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 12,241 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

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CERTIFICATE OF SERVICE

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