

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner

v.

AUTONOMOUS DEVICES, INC.,
Patent Owner

Case: IPR2023-01169
U.S. Patent No. 10,607,134

**PETITIONER'S OPPOSITION TO
PATENT OWNER'S MOTION TO AMEND**

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EXHIBIT LIST

TESLA-1001	U.S. Patent No. 10,607,134
TESLA-1002	Prosecution File History for U.S. Patent No. 10,607,134
TESLA-1003	Declaration of Jason Janet, Ph.D.
TESLA-1004	Curriculum Viate of Jason Janet, Ph.D.
TESLA-1005	U.S. Patent No. 8,142,268 (“Thomas”)
TESLA-1006	U.S. Patent No. 9,434,072 (“Buehler”)
TESLA-1007	U.S. Patent No. 9,008,840 (“Ponulak”)
TESLA-1008	U.S. Patent App. Pub. No. 2003/0171146 A1
TESLA-1009	U.S. Patent App. Pub. No. 2003/0032467 A1
TESLA-1010	U.S. Patent No. 9,195,934
TESLA-1011	Silva, Marty, <i>A Visual History of American Football Games</i> , IGN, July 8, 2013, available at, https://www.ign.com/articles/2013/07/08/a-visual-history-of-football-video-games
TESLA-1012	Macy, Seth G., <i>A Visual History of Racing Games</i> , IGN, updated Sept. 6, 2017, available at, https://www.ign.com/articles/2015/03/27/a-visual-history-of-racing-games
TESLA-1013	<i>Final Fantasy XI Released</i> , IGN, updated June 16, 2012, available at, https://www.ign.com/articles/2003/10/29/final-fantasy-xi-released
TESLA-1014	Ellis, Tim, et al., <i>Ellipse Detection and Matching with Uncertainty</i> , pp. 137-144

- TESLA-1015 Pomerleau, Dean A., *Neural Network Perception for Mobile Robot Guidance*, Feb. 16, 1992
- TESLA-1016 Lee, Ten-min, et al., *Computer Simulation of Learning Experiments with Autonomous Mobile Robots* (Univ. of Manchester, March 26, 1999)
- TESLA-1017 Durrant-Whyte, Hugh, et al., *Simultaneous Localisation and Mapping (SLAM): Part I The Essential Algorithms*
- TESLA-1018 Smith, Randall, et al., *Estimating Uncertain Spatial Relationships in Robotics*, pp. 167-193
- TESLA-1019 Zimmer, Kyle, *Evolution of the Game Console*, available at citadel.sjfc.edu/students-virtual/k/knz03095/public_html/imd/museum/index.html
- TESLA-1020 Stuart, Keith, *PS4 and Xbox One: so why aren't they backwards compatible?*, The Guardian, December 12, 2023, available at <https://www.theguardian.com/technology/2013/dec/12/ps4-and-xbox-one-so-why-arent-they-backwards-compatible>
- TESLA-1021 Christian, Mark, *Saved Game History: Battery Backups, Memory Cards, and the Cloud*, Mailchimp, Feb. 21, 2019, available at <https://tedium.co/2019/02/21/video-game-save-state-history/>
- TESLA-1022 Second Declaration of Dr. Jason Janet
- TESLA-1023 Transcript of Dr. Eli Saber Deposition
- TESLA-1024 Patent Owner's Response (Paper 26) in IPR2023-01055 on U.S. Patent 11,238,344
- TESLA-1025 U.S. Patent No. 7,399,224 to Hirai ("Hirai")
- TESLA-1026 Excerpt from Merriam-Webster's Collegiate Dictionary (2014)
- TESLA-1027 Navarro, Alex, *ESPN NFL 2K5 Review*, July 21, 2004, available at <https://www.gamespot.com/reviews/espn-nfl-2k5-review/1900-6103135/>

I. INTRODUCTION

Patent Owner (“**PO**”)’s Motion to Amend (“**MTA**”) includes substitute claims 21-36 to contingently amend claims 2-5, 7, and 9-19. Petitioner (“**Tesla**”) opposes the MTA at least because all of the Substitute Claims are unpatentable under 35 U.S.C. §§ 103 and 112.

II. THE SUBSTITUTE CLAIMS ARE UNPATENTABLE UNDER § 103

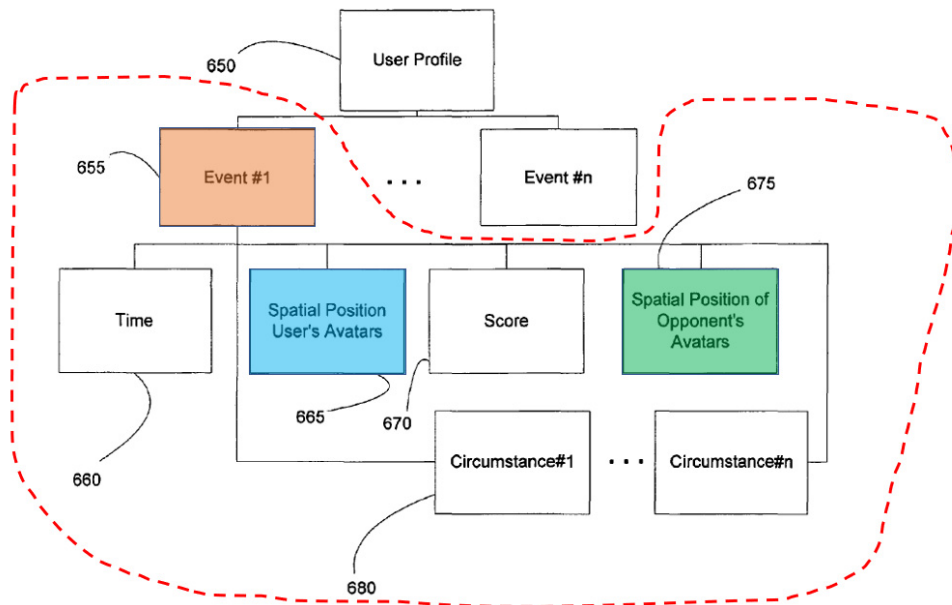
The original claims are unpatentable as discussed in the Petition and the Petitioner Reply. The Substitute Claims merely add well-known features to the original claims in a predictable manner that would have been obvious to a POSITA. TESLA-1022, ¶¶60-114; Pet., 4. Although PO asserts that the substitute claims are patentable over Thomas, this is not the case, as shown here: the newly added well-known features are rendered obvious by Thomas, either alone or in combination with Hirai¹. See MTA, 18-22; TESLA-1022, ¶¶60-114.

A. Supplemental overview of Thomas

Thomas’s approach to “simulating a particular user’s behavior in an interactive computer system” is enabled through the use of “user profiles 400” (*see* FIG. 4, *infra*) implemented as “individual data structures in a database.” TESLA-

¹ Hirai was published July 15, 2008, which is more than a year before the earliest effective filing date of the ’134 Patent (December 19, 2016), and Hirai thus qualifies as prior art under 35 U.S.C. §§102(a)(1) and 102(a)(2).

1005, Abstract, 9:37-39. A user profile includes “a sub-profile” corresponding to each of “one or more events 685 and/or situations 655 that occur during operation of the program by the user, where “[a]n event 685 is a particular action occurring,” and “a situation 655 is the surrounding circumstances during which an event 685 may take place.” *Id.*, 4:16-19; TESLA-1022, ¶62. For instance, the sub-profile associated to Event #1 (orange) is outlined in dashed red lines. TESLA-1022, ¶62. The sub-profile for a given event stores parameter values that define the event/situation. *See* TESLA-1005, 4:23-24 (“Each event 685 and situation 655 are defined by a set of one or more parameters”).



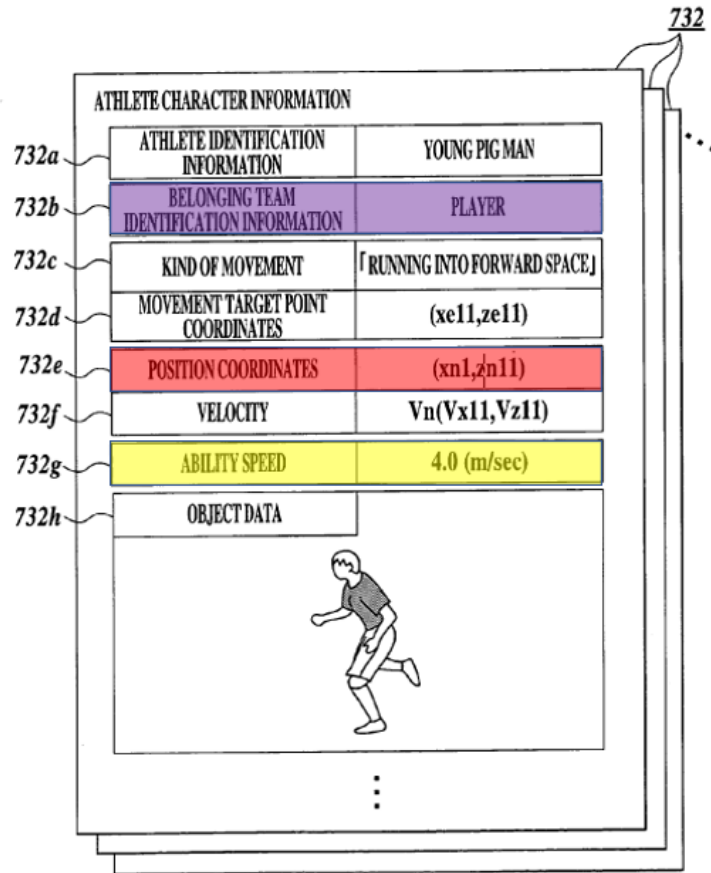
Excerpt from Thomas, FIG. 4 (annotated)

The user profile is built “[d]uring learning mode” by “record[ing] a user’s input as the user is interacting with the game.” TESLA-1005, 9:35-36.

Specifically, the user's input is stored in the user profile such that it is "logically linked to an event and/or situation that initiated the user's input." *Id.*, 9:44-45. In addition, "one or more current circumstances during the occurrence of the event are analyzed and stored," *e.g.*, parameter values defining the current circumstances are stored. *Id.*, 9:56-59; *see* 5:9-13. Thomas provides a variety of examples of parameters can be stored to define current circumstances, including "the spatial position of avatars controlled by the user 665" (blue *supra*), "the spatial position(s) of the avatars controlled by one or more user opponents 675 of the game" (green), and "the archetype of [each] avatar" (*e.g.*, for a basketball game, archetypes include "true point guard, slasher, shooter, pure shooter, low post scorer, midrange scorer, and role player"). *Id.*, 4:31-51; *see* 8:38-40, 9:46-53; TESLA-1022, ¶¶63-64.

Later, during playback mode, when "a particular event occurs, the simulator 120 may invoke a corresponding reaction based on the stored data." TESLA-1005, 9:65-67. Specifically, "the simulator 120 monitors and analyzes the operation of the computer program in search of particular events and/or situations." *Id.*, 5:34-36. Upon identifying "the occurrence of a particular event linked to a field or sub-profile of the user's profile," the simulator generates a response "which would represent the second user's response to the occurring situation or event." *Id.*, 5:36-61; *see* 5:26-29; TESLA-1022, ¶65.

B. Overview of Hirai



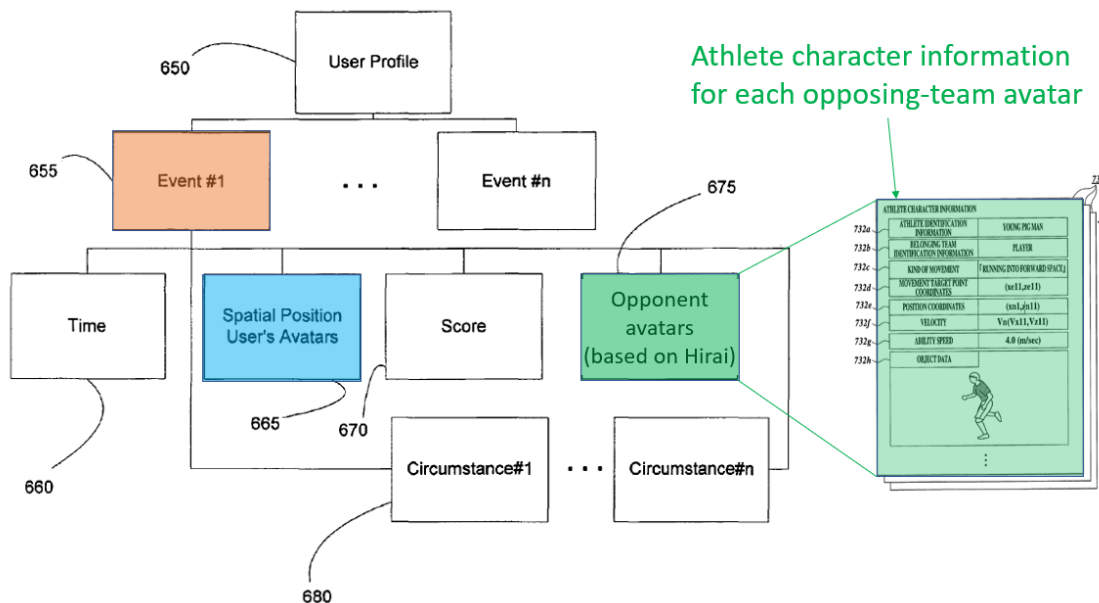
Excerpt from Hirai, FIG. 9

Hirai describes an approach to “realiz[ing] the movement control of non-player characters” in a video game, *e.g.*, “to bring the movements of the non-player characters closer to those of actual soccer athletes for heightening the reality of a soccer game.” TESLA-1025, 2:18-23. For instance, Hirai uses information about non-player (*e.g.*, computer-controlled) characters to “determin[e] which non-player character NPC in the team executes which movement.” *Id.*, 10:8-10; TESLA-1022, ¶66. As shown in FIG. 9, *infra*, Hirai bases its control of NPCs on stored “athlete character information,” which includes, among other things, “athlete

identification information 732a,” “belonging team identification information 732b” (purple), “position coordinates 732e on the present pitch Fp” (red), and “an ability speed 732g” (yellow). TESLA-1025, 13:44-55; TESLA-1022, ¶67.

C. The Thomas-Hirai combination

In the Thomas-Hirai combination, as taught by Thomas, a user profile established during learning mode contains “a sub-profile related to one or more events 685 and/or situations 655,” where the sub-profile stores parameters defining the event/situation. TESLA-1005, 4:13-16. For instance, a sub-profile 675 (green *infra*) stores parameters characterizing “the spatial position(s) of the avatars controlled by one or more user opponents,” and “the archetype” of each opposing-team avatar. TESLA-1005, 4:13-50, 9:40-45; TESLA-1022, ¶68.



Thomas-Hirai Combination (Composite figure based on Thomas, FIG. 4)

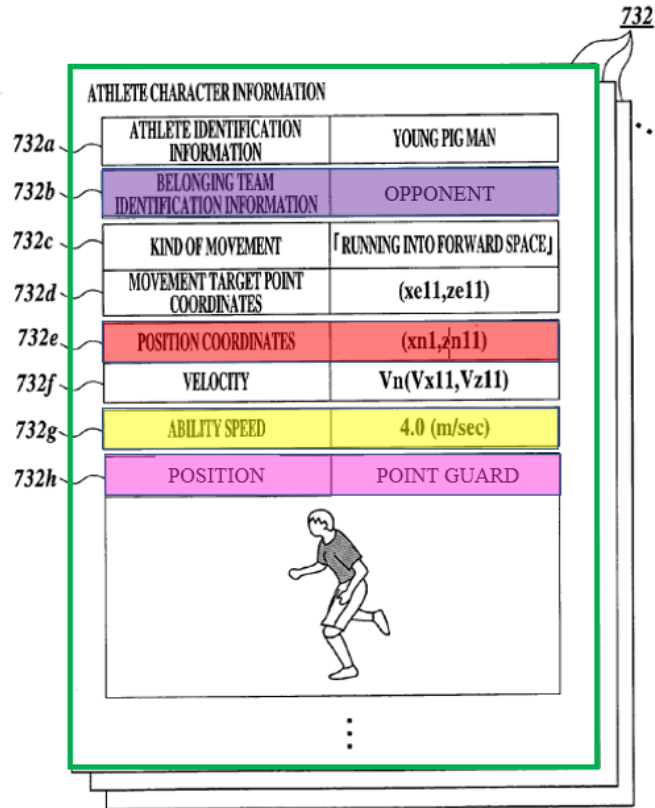
Further, based on Hirai, it would have been obvious to implement Thomas’s

sub-profile 675 to include an “athlete character information” data structure for each opposing-team avatar, such that parameters already identified for storage by Thomas, *e.g.*, at least parameters characterizing each opposing-team avatar, would be stored in a respective “athlete character information” data structure, as illustrated *supra*. TESLA-1025, 13:44-55; TESLA-1022, ¶69.

In more detail, in the combination, each athlete character information data structure (*see* Hirai, FIG. 9, *infra*) would store parameters including “belonging team identification information 732b” (purple) indicating that the avatar is an opposing-team avatar, consistent with Thomas’s tracking of whether the avatar is “controlled by the user” or “controlled by one or more user opponents.” TESLA-1025, 13:44-55; TESLA-1005, 4:31-40; TESLA-1022, ¶69. The data structure would further include “position coordinates 732e” (red) specifying the avatar’s position, consistent with Thomas’s teachings that position parameters are stored. TESLA-1025, 13:44-55; *see also* TESLA-1005, 4:38-39 (“the spatial position(s) of the avatars controlled by one or more user opponents”). Additionally, the data structure would predictably include an “ability parameter[]” such as “an ability speed 732g” (yellow), based on Thomas’s teaching that the stored parameters include “the archetype of the avatar,” which “can be defined by relative size, strength, and speed.” TESLA-1025, 13:44-55; TESLA-1005, 4:45-48; *see* 8:38-40. Optionally, the data structure would further include a field representing the

avatar's player position (pink), again consistent with Thomas's description that this information can be stored. *See* TESLA-1005, 4:45-51, 8:38-40; TESLA-1022,

¶69.



Thomas-Hirai Combination (Composite figure based on Hirai, FIG. 9)

A POSITA would have been motivated to implement the sub-profile 675 of Thomas's user profile to include an athlete character information data structure for each opposing-team avatar, based on Hirai. TESLA-1022, ¶¶70-74.

First, a POSITA would have implemented Thomas's sub-profile 675 in accordance with Hirai's suggestion for an athlete character information data structure storing parameters characterizing opposing-team avatars to achieve the

benefit expressly noted in Hirai of “bring[ing] the movements of non-player characters,” *e.g.*, opposing-team avatars, “closer to those of actual soccer athletes for heightening the reality of a soccer game.” TESLA-1025, 2:20-23; TESLA-1022, ¶71. A POSITA would have recognized the improved user experience that would result from implementing Thomas’s user profile in a way that further enables realistic and believable opposing-team player actions. TESLA-1022, ¶71.

Second, a POSITA would have looked to Hirai as a model for how to implement the general concept—a data structure storing parameters characterizing avatars—that is discussed but not detailed in Thomas. TESLA-1022, ¶72. That is, while Thomas indicates that parameters are to be stored in a data structure, it does not provide specific implementation details. Hirai’s approach to storing parameters characterizing avatars was a known technique to implementing data structures for storage of avatar-specific parameters, thus motivating the combination. *See Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023) (“And if there's a known technique to address a known problem using “prior art elements according to their established functions,” then there is a motivation to combine. *Intel*, 21 F.4th at 799–800. And we specify address a known problem because “[i]t's not necessary to show that a combination is the best option, only that it be a suitable option.” *Id.* at 800 (cleaned up) (emphasis in original)”).

Third, the Thomas-Hirai combination merely involves the application of known techniques (*e.g.*, player-specific parameters stored in player-specific data structures) to a known system (*e.g.*, Thomas's user profile) to yield predictable results (*e.g.*, a user profile in which parameter characterizing opposing-team avatars are stored in avatar-specific data structures). TESLA-1022, ¶73. The Supreme Court has been clear that where, as here, a supposed invention "simply arranges old elements with each performing the same function it had been known to perform," the invention is obvious. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007).

A POSITA would have reasonably expected success in pursuing the combination described above at least because Thomas and Hirai are both in the field of video game technology, and both specifically address problems related to the realistic computer control of video games. TESLA-1022, ¶74. A POSITA also would have reasonably expected success considering that the implementation of data structures by the relatively late time of the '134 Patent was conventional and predictable. TESLA-1022, ¶74.

D. Analysis of the substitute claims as obvious over Thomas alone or over the Thomas-Hirai combination

Thomas, or alternatively the Thomas-Hirai combination, renders obvious the substitute claims, as set forth in the Petition and as discussed *infra* with respect to the newly added limitations. Thomas expressly discloses at least Elements

[SUB.1]-[SUB.2] and [SUB.5]-[SUB.6] and renders obvious Elements [SUB.3]-[SUB.4]. Alternatively, Thomas-Hirai renders obvious all newly added features. TESLA-1022, ¶¶75-114.

1. **Element [SUB.1]: “wherein the first one or more object representations comprise: a first object representation that represents a first three dimensional (3D) object of the application, and a second object representation that represents a second three dimensional (3D) object of the application, and”²**

Each of Thomas’s avatars (*e.g.*, players in a sports game application) corresponds to a respective *object of the application*. *See* Petition, 14; TESLA-1005, 4:32-39; TESLA-1022, ¶¶76-77. A POSITA would have understood that Thomas’s avatars are *three dimensional (3D) object[s] of the application, e.g.*, given the implementation of Thomas’s video game in the context of the ESPN NFL 2K5 game (which has “3D” characters), as explained by Dr. Janet. TESLA-1022, ¶¶78-79 (citing TESLA-1027).

The Petition explains that during learning mode, Thomas stores parameters defining the “current circumstances,” *e.g.*, “the surrounding circumstances during which an event 685 may take place.” TESLA-1005, 4:17-19. These include parameters characterizing the avatars, such as “spatial position” of user-controlled

² Petitioner interprets this limitation as best understood and without conceding that the claim language is definite. *See* §III, *infra*.

or opposing-team avatars and “archetype of the avatar.” TESLA-1005, 4:46-51, 9:43-53; *see* 8:37-42, 10:33-42; *see* Petition, 12-13. These stored data characterizing avatars correspond to ***the first one or more object representations that represent objects of the application*** (the avatars). *See* Petition, 12-13; TESLA-1022, ¶80.

Each avatar is characterized by corresponding parameters, *e.g.*, specifying whether that avatar is user-controlled or on the opposing team, the location of that avatar, and/or the archetype of that avatar. *See* TESLA-1005, 4:46-51, 9:43-53, 8:37-42, 10:33-42; TESLA-1022, ¶81. Data characterizing a particular avatar (*e.g.*, a particular opposing-team avatar) corresponds to ***a first object representation that represents*** that particular avatar (***a first 3D object of the application***). Similarly, data characterizing a second avatar (*e.g.*, another opposing-team avatar or a user-controlled avatar) corresponds to ***a second object representation that represents*** that other avatar (***a second 3D object of the application***). TESLA-1022, ¶81.

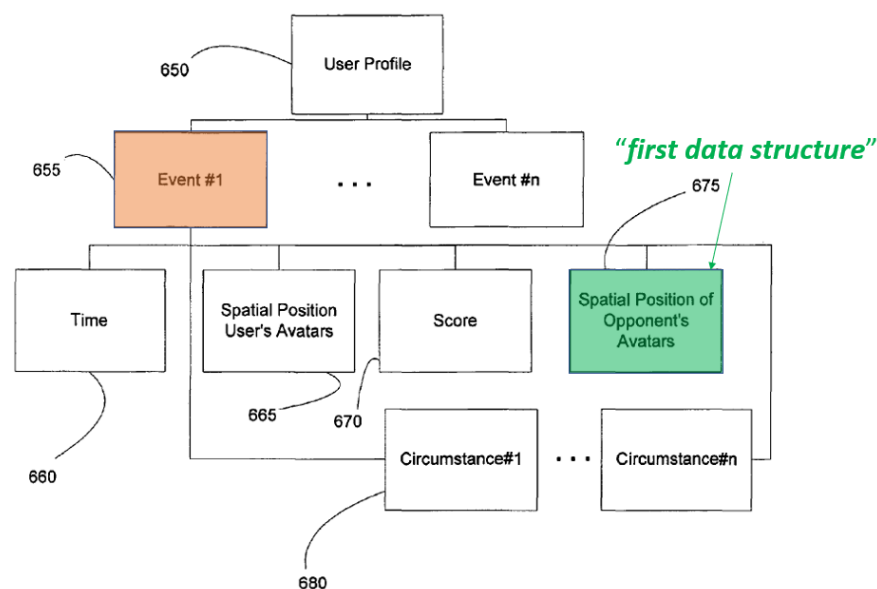
For at least the foregoing reasons, element [SUB.1] is rendered obvious by Thomas alone or by the Thomas-Hirai combination. TESLA-1022, ¶¶76-81.

2. Element [SUB.2]: “wherein the first object representation includes a first data structure that:”

Thomas’s fields/sub-profile characterizing a given opposing-team avatar

corresponds to a first data structure

Thomas describes “data structures herein referred to as user profiles, which may be individual data structures in a database 130.” TESLA-1005, 4:8-10; *see* 3:57-59 (“The data is stored in a data structure generally referred to as a user’s profile, corresponding to the first user”), 9:36-39. An example user profile data structure is illustrated in FIG. 4, *infra*. TESLA-1022, ¶¶82-84.



Excerpt from Thomas, FIG. 4 (annotated)

“Each user profile has fields or sub-profiles logically associated, or linked, to one or more events and/or situations.” *Id.*, 4:10-12; *see* Abstract (“The simulator is further configured to ... store the one or more user inputs in one or more data fields”). The sub-profiles themselves “each contain[s] fields or additional sub profiles” (*e.g.*, sub-profiles 660-680 in FIG. 4) that together define the situation associated with the respective event. TESLA-1005, 9:40-42; *see* 4:23-24 (“Each

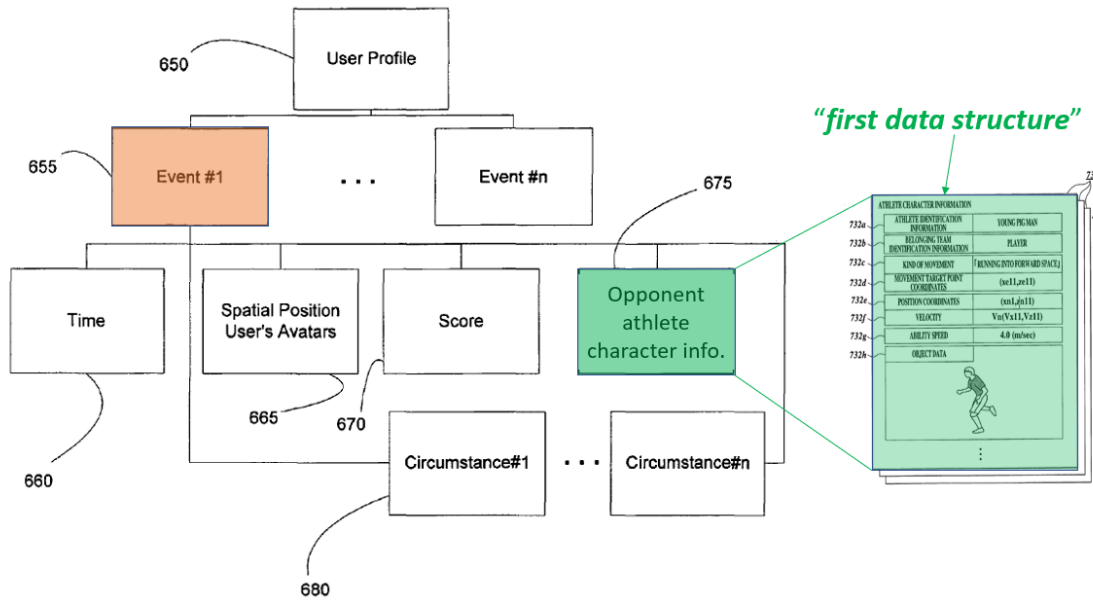
event 685 and situation 655 are defined by a set of one or more parameters”). Each of these fields/additional sub-profiles corresponds to ***a data structure*** because it is composed of structured data, *e.g.*, fields containing data. TESLA-1022, ¶85. Alternatively/additionally, each field/additional sub-profile corresponds to ***a data structure*** because it is a portion of the user profile, which is itself a “data structure[] in a database.” TESLA-1005, 9:38-39; TESLA-1022, ¶85.

Among other things, the sub-profile for Event #1 includes fields/sub-profile 675 storing parameters characterizing opposing-team avatars, *e.g.*, specifying “the spatial position(s) of the avatars controlled by one or more user opponents 675 of the game.” *Id.*, 4:37-39. The portion of the fields/sub-profile 675 (green *supra*) storing parameters for a specific opposing-team avatar is likewise ***a data structure*** because it is composed of structured data (*e.g.*, fields containing parameter values for that avatar), and/or because it is a portion of the user profile data structure. TESLA-1022, ¶86. The characterization of a particular opposing-team avatar (the ***first object representation***) includes this portion of the fields/sub-profile 675 (***first data structure***).

The Thomas-Hirai combination renders obvious a first data structure

Alternatively/additionally, in Thomas-Hirai, Thomas’s fields/sub-profile 675 is implemented such that parameters characterizing each opposing-team avatar are stored in respective “athlete character information” data structures, illustrated

infra. TESLA-1025, 13:44-55; TESLA-1022, ¶87. The “athlete character information” characterizing a particular opposing-team avatar (*first object representation*) corresponds to *a first data structure*. TESLA-1022, ¶87.



Thomas-Hirai composite figure based on Thomas, FIG. 4

The athlete character information is *a data structure* at least because it is structured data, *e.g.*, with fields containing values, as illustrated in Hirai’s FIG. 9. TESLA-1022, ¶88. Alternatively/additionally, the athlete character information is *a data structure* because it is a portion of the user profile, which is itself a “data structure[] in a database.” TESLA-1005, 9:38-39; TESLA-1022, ¶88.

3. Element [SUB.3]: “is generated at least in response to processing a type and a location of the first 3D object, and”

Thomas describes that “a user profile 400 for each user is created and stored in the database.” TESLA-1005, 9:59-60; *see* 4:60-62 (“During operation, the

simulator 120 retrieves, creates, or establishes, a user profile”). Specifically, to create the user profile (*e.g.*, ***the first data structure is generated***), whether implemented based on Thomas or Thomas-Hirai, “one or more current circumstances during the occurrence of the event are analyzed and stored” (***in response to processing*** the current circumstances). *Id.*, 9:57-59; TESLA-1022, ¶¶89-90. Specifically, a POSITA would have found generation of the data structure ***in response*** to processing the current circumstances to be an obvious implementation design choice. As explained by Dr. Janet, data structures can be generated in advance or on demand (*e.g.*, ***in response*** to an event, such as in response to processing data). TESLA-1022, ¶91. There is nothing unexpected or unpredictable about either of these approaches, and a POSITA would thus have found this claimed element to be obvious. *See In re Kuhle*, 526 F.2d 553, 555 (CCPA 1975); *In re Chu*, 66 F.3d 292, 298-99 (Fed. Cir. 1995).

As taught by Thomas, the current circumstances for an event can include the locations of the players on the field/court: “a situation 655 may be ... the position of players on the football field,” *e.g.*, ***a location of the first 3D object*** (an opposing-team avatar; *see* [SUB.1]). TESLA-1005, 4:19-21. For instance, in the context of a pump fake event, the “current circumstances” include “how covered the user was,” *e.g.*, locations of the opposing-team avatars that are in the vicinity of the user. *Id.*, 8:8-11; *see* 7:56-59; TESLA-1023, 90:9-13 (explaining that in the

context of a pump fake event, “it knows the user’s location on the field, it knows the opponent user location on – the opponent player on the field, and it records how often you’ve pumped faked when you’re in this situation”); TESLA-1022, ¶92. These current circumstances are “defined” by parameters stored in the user profile, *e.g.*, parameters specifying “the spatial position(s) of the avatars controlled by one or more user opponents 675 of the game.” *Id.*, 4:23-24, 4:37-39. In view of Thomas’s statement that the current circumstances “are analyzed and stored,” a POSITA would have understood this analysis to involve analyzing (*e.g.*, ***processing) a location of the first 3D object*** (*e.g.*, location of an opposing-team avatar) to obtain the spatial position parameters for storage. TESLA-1005, 9:57-59; TESLA-1022, ¶92.

The parameters indicating avatar spatial positions are stored in a way that indicates the team affiliation of the avatars—a ***type of the first 3D object***—*e.g.*, whether they are “avatars controlled by ... user opponents” or “avatars controlled by the user.” TESLA-1005, 4:31-39; *see* 7:56-59, 8:8-11; TESLA-1022, ¶93. Again in the context of a pump fake event, the “current circumstances” include “how covered the user was,” *e.g.*, locations of the opposing-team avatars (***type***) that are in the vicinity of the user. TESLA-1005, 8:8-11; *see* 7:55-64; TESLA-1022, ¶¶93-94. In view of Thomas’s statement that current circumstances “are analyzed and stored,” a POSITA would have understood this analysis to involve

analyzing (*processing*) *the type of the first 3D object* (e.g., the avatar's team affiliation), e.g., such that each avatar's location can be stored properly as "spatial position(s) of the avatars controlled by one or more user opponents" or of "avatars controlled by the user." TESLA-1005, 4:31-39, 9:57-59; TESLA-1022, ¶¶93-94.

"Another type of parameter" that is stored to define current circumstances is "the archetype of the avatar." TESLA-1005, 4:46-47; *see* 8:33-40. The archetype of an avatar can be the avatar's assigned position on the team (*a type of the first 3D object*). *See* TESLA-1005, 4:47-51 ("In the case of a basketball game, wherein avatars represent players of the game, archetypes can include true point guard, slasher, shooter, pure shooter, low post scorer, midrange scorer, and role player"), 8:33-40; TESLA-1022, ¶95. An avatar's archetype also can be specified by its skill (alternatively/additionally *a type of the first 3D object*): "an archetype can be defined by relative size, strength, and speed." TESLA-1005, 4:47-48. TESLA-1022, ¶95. Again in view of Thomas's statement that the current circumstances "are analyzed and stored," a POSITA would have understood Thomas's disclosure as encompassing analysis (*processing*) of an avatar's archetype (*the type of the first 3D object*), e.g., in order to store parameters characterizing its archetype. TESLA-1005, 9:57-59; TESLA-1022, ¶95.

For at least the foregoing reasons, element [SUB.3] is rendered obvious by Thomas alone or by the Thomas-Hirai combination. TESLA-1022, ¶¶89-95.

4. **Element [SUB.4]: “comprises a label indicating the processed type of the first 3D object and a coordinate indicating the processed location of the first 3D object, and”**

Thomas renders this limitation obvious

Thomas’s field/sub-profile 675 (the *first data structure*; see [SUB.2]) stores parameters specifying “the spatial position(s) of the avatars controlled by one or more user opponents 675 of the game,” e.g., parameters *indicating the processed location of the first 3D object*. TESLA-1005, 4:37-39; see 7:55-8:27. For instance, in the context of a pump fake event, Thomas describes that “the simulator 120 records how covered the user was,” e.g., the *location* of opposing-team avatars in the vicinity of the user. *Id.*, 8:10-11; TESLA-1022, ¶¶96-98. A POSITA further would have understood that the data Thomas stores to indicate the spatial position of an avatar constitutes a *coordinate* that characterizes the avatar’s location.³

Even if Thomas does not expressly disclose a “coordinate,” it nonetheless would have been obvious to implement Thomas to store the avatar’s spatial position using coordinates consistent with conventional programming practices by the earliest effective filing date of the ’134 patent. TESLA-1022, ¶100. For example, a POSITA would have recognized a limited number of options for storing

³ “Coordinate” is defined as “any of a set of numbers used in specifying the location of a point on a line, on a surface, or in space.” TESLA-1026, 2.

location information in the context of a video game, as detailed by Dr. Janet.

TESLA-1022, ¶100. And the use of coordinates—one of these limited number of options—presents no unexpected results or solution but was rather an obvious design choice. TESLA-1022, ¶100. *See In re Kuhle*, 526 F.2d 553, 555 (CCPA 1975) (use of claimed feature solves no stated problem and presents no unexpected result and “would be an obvious matter of design choice within the skill of the art”); *In re Chu*, 66 F.3d 292, 298-99 (Fed. Cir. 1995) (“design choice” is appropriate where applicant fails to set forth reasons why the differences between the claimed invention and the prior art would result in a different function).

The fields/sub-profile 675 is specific to the “Opponent’s Avatars.” TESLA-1005, FIG. 4. A POSITA would have understood, or at least found obvious, that this data structure would include an indication of this team affiliation (*e.g.*, an indication of ***indicating the processed type of the first 3D object***), *e.g.*, to enable parameters characterizing opposing-team avatars to be distinguished from parameters characterizing user-controlled avatars. TESLA-1022, ¶101.

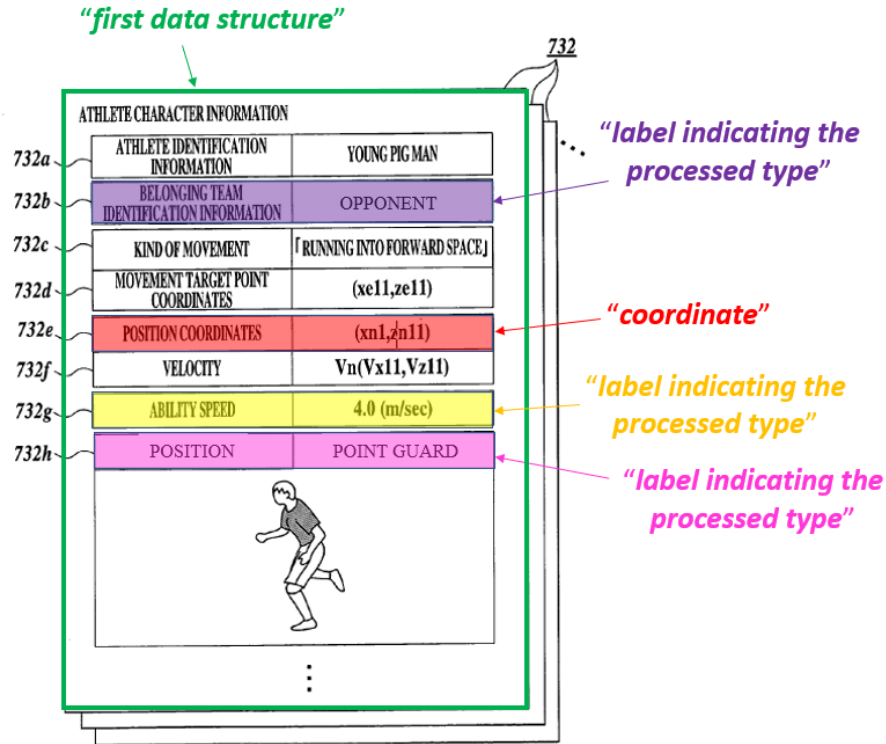
Alternatively/additionally, Thomas’s simulator “records the archetype” of an avatar, *e.g.*, a parameter ***indicating the processed type of the 3D object***. TESLA-1005, 8:38-40. A POSITA would have found it obvious for an avatar’s archetype (*e.g.*, playing position and/or skill level; *see* TESLA-1005, 4:46-51) to be stored with other parameters characterizing that avatar, *e.g.*, in ***the first data structure*** for

that avatar, *e.g.*, to enable realistic simulation of that avatar. TESLA-1022, ¶102.

Thomas-Hirai renders this limitation obvious

Alternatively/additionally, Thomas's fields/sub-profile 675 is implemented such that parameters characterizing each opposing-team avatar are stored in a corresponding "athlete character information" data structure (the ***first data structure***; *see* [SUB.2], *supra*). *See* TESLA-1025, 13:44-55; TESLA-1022, ¶103.

The athlete character information (the ***first data structure***) includes "position coordinates 732e on the present pitch Fp," *red infra, e.g., a coordinate indicating the processed location of the first 3D object*. TESLA-1025, 13:53-54; TESLA-1022, ¶104. For instance, those stored coordinates for a particular opposing-team avatar (***the first 3D object***) are coordinates specifying "the spatial position[]" of that avatar, consistent with Thomas's teachings that this position information is recorded. TESLA-1005, 4:37-39; TESLA-1022, ¶104.



Thomas-Hirai composite figure based on Hirai, FIG. 9

In the combination, this athlete character information (the *first data structure*) stores "belonging team identification information 732b," purple *infra*, e.g., indicating whether the corresponding avatar belongs to the user's team or the opposing team (e.g., data *indicating the processed type of the first 3D object*). TESLA-1025, 13:48-49; TESLA-1022, ¶105. This team affiliation information corresponds to *a label*, e.g., because it is a data element identifying/classifying the type (affiliation) of the avatar. TESLA-1022, ¶105.

In the combination, the athlete character information data structure also stores an "ability parameter[]" such as "an ability speed 732g," yellow *supra*. TESLA-1025, 13:56-57. This ability parameter is alternatively/additionally data

indicating the processed type of the first 3D object, e.g., indicating the “archetype” of the avatar, e.g., “as defined by relative size, strength, and speed,” as taught by Thomas. TESLA-1005, 4:47-48; TESLA-1022, ¶106. This parameter corresponds to *a label*, e.g., because it is a data element identifying/classifying the type (archetype) of the avatar. TESLA-1022, ¶106.

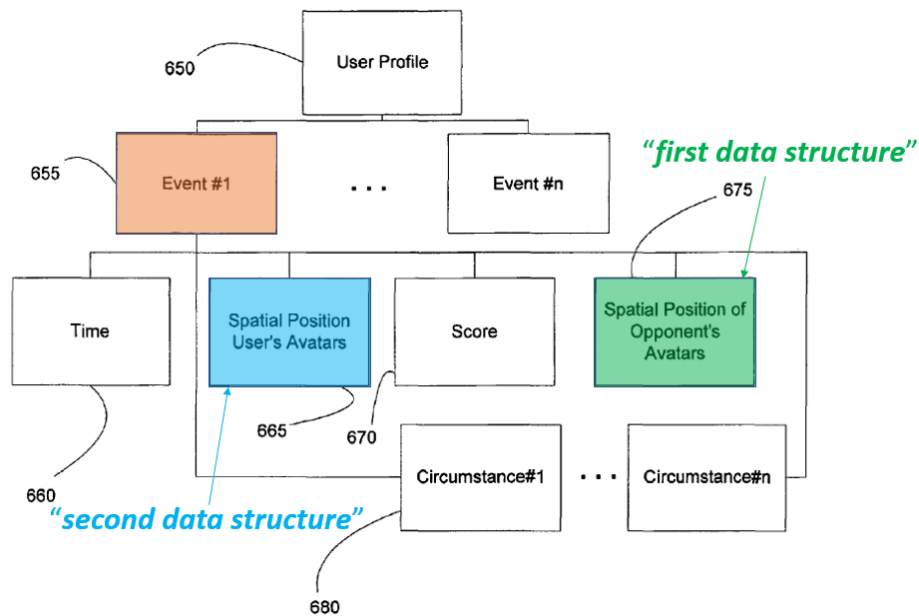
Also in the combination, the athlete character information data structure stores a parameter (pink *supra*) indicating “the archetype of the avatar,” e.g., the avatar’s player position, consistent with Thomas’s teaching that this information is recorded. TESLA-1005, 4:48-51; TESLA-1022, ¶107. This position parameter is alternatively/additionally data *indicating the processed type of the first 3D object*, e.g., indicating the “archetype” of the avatar as specified by its player position. TESLA-1005, 4:48-51; TESLA-1022, ¶107. This parameter corresponds to *a label*, e.g., because it is a data element identifying/classifying the type (archetype) of the avatar. TESLA-1022, ¶107.

5. Element [SUB.5]: “wherein the second object representation includes a second data structure, and”

Thomas renders obvious a second data structure

The characterization of a second opposing-team avatar (the *second object representation*) includes a portion of the fields/sub-profile 675 that stores parameters for that second opposing-team avatar (*a second data structure*). See [SUB.2], *supra*; TESLA-1022, ¶¶108-110.

Alternatively/additionally, Thomas's fields/subprofile 665 (a ***data structure***; see [SUB.2], *supra*) stores parameters characterizing user-controlled avatars, *e.g.*, their "spatial position." TESLA-1005, 4:31-33. The characterization of the user-controlled avatar (the ***second object representation***) includes the fields/subprofile 665 (***second data structure***), blue *infra*. TESLA-1022, ¶111.

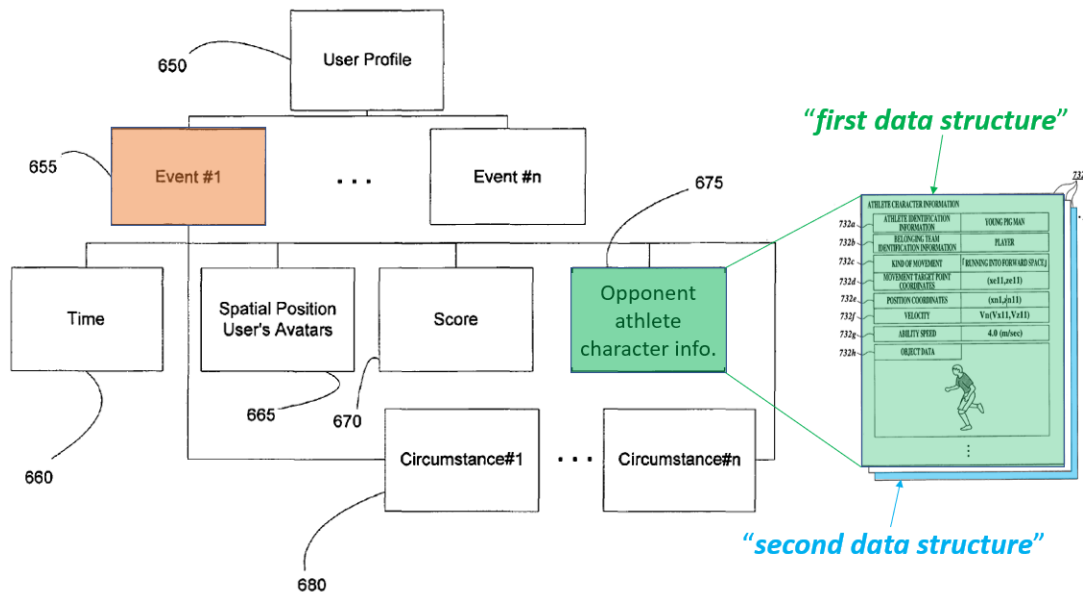


Excerpt from Thomas, FIG. 4 (annotated)

The Thomas-Hirai combination renders obvious a second data structure

Alternatively/additionally, in the Thomas-Hirai combination, Thomas's sub-profile 675 characterizing opposing-team avatars is implemented such that parameters characterizing each opposing-team avatar are stored in respective "athlete character information" data structures, as illustrated *infra*. TESLA-1025, 13:44-55; TESLA-1022, ¶112. The "athlete character information" characterizing a second opposing-team avatar (***second object representation***) corresponds to *a*

second data structure, blue *infra*. TESLA-1022, ¶112.



Thomas-Hirai composite figure based on Thomas, FIG. 4

6. **Element [SUB.6]: “wherein the first data structure and the second data structure are correlated with the first one or more instruction sets for operating the first avatar of the application.”**

The *first and second data structures* store parameters that define a situation/current circumstance corresponding to an event (*see* TESLA-1005, 4:23-24 (“Each event 685 and situation 655 are defined by a set of one or more parameters”), where the situation and/or event are *correlated with the instruction sets*, *e.g.*, user inputs. *See* Petition, 28-31; TESLA-1005, Abstract, 5:9-13 (“when a user responds to an event, the user’s response, when recorded, is not only associated with the occurrence of that event, but also with the situation during the occurrence of that event, which is defined by one or more current circumstances”), FIG. 3a, 4:60-5:4; TESLA-1022, ¶¶113-114.

For at least the foregoing reasons, element [SUB.6] is rendered obvious by Thomas alone or by the Thomas-Hirai combination. TESLA-1022, ¶¶113-114.

III. THE SUBSTITUTE CLAIMS ARE UNPATENTABLE UNDER § 112

The substitute claims are unpatentable under 35 USC § 112(b) as indefinite. Claim 21 recites “second object representations” in the following limitations:

[21.d] “generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;

[21.h] “the first one or more object representations comprise: .. a second object representation that represents a second three dimensional (3D) object of the application”

[21.l] “the second object representation includes a second data structure”

It is unclear whether the “second object representation” of [21.l] refers to the “second one or more object representations” of [21.d] or the “second object representation” of [21.h]. A similar issue applies to the other substitute claims.

Respectfully submitted,

Dated: June 24, 2024

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CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petitioners' Opposition to Patent Owner's Motion to Amend totals 25 pages, which is equal to the 25 page limit allowed under 37 CFR § 42.24.

Dated: June 24, 2024

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(1) and 42.6(e)(4)(iii), the undersigned certifies that on June 24, 2024, a complete and entire copy of this Petitioner's Reply to Patent Owner's Response was provided via email to the Patent Owner by serving the email correspondence addresses of record as follows:

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**IV. APPENDIX A: Listing of Claim Elements in PO's Substitute Claims
('134 Patent)**

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
[1.1]	[21.pre] [22.pre] [23.pre] [24.pre] [25.pre] [26.pre] [27.pre] [28.pre] [29.pre] [30.pre] [31.pre] [32.pre] [33.pre] [35.pre] [36.pre]	21-33, 35-36	A system comprising:
[1.1]	[21.a] [22.a] [23.a] [24.a] [25.a] [26.a] [27.a] [28.a] [29.a] [30.a]	21-33, 35-36	one or more processors; and

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
	[31.a] [32.a] [33.a] [36.a]		
[1.2]	[21.b] [22.b] [23.b] [24.b] [25.b] [26.b] [27.b] [28.b] [29.b] [30.b] [31.b] [32.b] [33.b] [36.b]	21-33, 35-36	one or more non-transitory machine readable media storing machine readable code that, when executed by the one or more processors, causes the one or more processors to perform at least:
[1.3]	[21.c] [22.c] [23.c] [24.c] [25.c] [26.c] [27.c] [28.c] [29.c]	21-33, 35-36	accessing a first correlation including a first one or more object representations correlated with a first one or more instruction sets for operating a first avatar of an application, wherein the first one or more object representations represent one or more objects of the application;

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
	[30.c] [31.c] [32.c] [33.c] [36.c]		
[1.4]	[21.d] [22.d] [23.d] [24.d] [25.d] [26.d] [27.d] [28.d] [29.d] [30.d] [31.d] [32.d] [33.d] [36.d]	21-33, 35-36	generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;
[1.5]	[21.e] [22.e] [23.e] [24.e] [25.e] [26.e] [27.e] [28.e]	21-33, 35-36	determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations; and

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
	[29.e] [30.e] [31.e] [32.e] [33.e] [36.e]		
[1.6]	[21.f] [22.f] [23.f] [24.f] [25.f] [26.f] [27.f] [28.f] [29.f] [30.f] [31.f] [32.f] [33.f] [36.f]	21-33, 35-36	least in response to the determining, causing the first avatar of the application or a second avatar of the application to perform one or more operations defined by the first one or more instruction sets for operating the first avatar of the application at least by executing the first one or more instruction sets for operating the first avatar of the application;
[3.1]-[3.2]	[21.g]	21	wherein the determining the first one or more instruction sets for operating the first avatar of the application based on the at least partial match between the second one or more object representations and the first one or more object representations includes: determining that a number of at least partially matching portions

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
			of the second one or more object representations and portions of the first one or more object representations exceeds a threshold number, or determining that a percentage of at least partially matching portions of the second one or more object representations and portions of the first one or more object representations exceeds a threshold percentage;
[4.1]-[4.4]	[22.g]	22	wherein the first correlation is included in a knowledgebase, and wherein the knowledgebase further includes a third correlation including a third one or more object representations correlated with a third one or more instruction sets for operating: the first avatar of the application, the second avatar of the application, a third avatar of the application, or an avatar of another application, and wherein the third one or more object representations represent one or more objects of: the application, or the another application, and wherein the first correlation is connected with the third correlation by a connection;
[5]	[23.g]	23	wherein the second avatar of the application performs the one or more operations defined by the first one or more instruction sets for operating the first avatar of the application;

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
[7]	[24.g]	24	wherein, to correlate the first one or more object representations with the first one or more instruction sets for operating the first avatar of the application, a determination is made that the first one or more instruction sets for operating the first avatar of the application temporally correspond to the first one or more object representations;
[9]	[25.g]	25	wherein the first correlation is included in a first knowledge cell, and wherein the first knowledge cell is a data structure for storing, structuring, or organizing the first correlation;
[11.1]-[11.5]	[26.g]	26	wherein the first correlation is included in a knowledgebase, and wherein the knowledgebase further includes a third correlation including a third one or more object representations correlated with a third one or more instruction sets for operating the first avatar of the application, and wherein the third one or more object representations represent one or more objects of the application, and wherein at least a portion of the first correlation is learned in a learning process that includes operating the first avatar of the application at least partially by a user, and wherein at least a portion of the third correlation is learned in another learning

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
			process that includes operating the first avatar of the application at least partially by the user, and wherein the user is: a human user, or a non-human user;
[12.1]- [12.4]	[27.g]	27	wherein the first correlation is included in a knowledgebase, and wherein the knowledgebase further includes a third correlation including a third one or more object representations correlated with a third one or more instruction sets for operating the first avatar of the application, and wherein the third one or more object representations represent one or more objects of the application, and wherein at least a portion of the first correlation is learned in a learning process that includes operating the first avatar of the application at least partially by a user, and wherein at least a portion of the third correlation is learned in another learning process that includes operating the first avatar of the application at least partially by another user, and wherein the user is: a human user, or a non-human user, and wherein the another user is: a human user, or a non-human user;
[13.1]- [13.5]	[28.g]	28	wherein the first correlation is included in a knowledgebase, and wherein the knowledgebase further includes a third

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
			correlation including a third one or more object representations correlated with a third one or more instruction sets for operating a third avatar of the application, and wherein the third one or more object representations represent one or more objects of the application, and wherein at least a portion of the first correlation is learned in a learning process that includes operating the first avatar of the application at least partially by a user, and wherein at least a portion of the third correlation is learned in another learning process that includes operating the third avatar of the application at least partially by: the user, or another user, and wherein the user is: a human user, or a nonhuman user, and wherein the another user is: a human user, or a non-human user;
[14.1]-[14.3]	[29.g]	29	wherein the first correlation is included in a knowledgebase, and wherein the knowledgebase further includes a third correlation including a third one or more object representations correlated with a third one or more instruction sets for operating an avatar of another application, and wherein the third one or more object representations represent one or more objects of the another application;

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
[15]	[30.g]	30	wherein the first one or more instruction sets for operating the first avatar of the application include one or more information about one or more states of: the first avatar of the application or a portion of the first avatar of the application;
[16]	[31.g]	31	wherein: an element of the first correlation is deleted after the first correlation is generated, an element of the first correlation is modified after the first correlation is generated, an element of the first correlation is manipulated after the first correlation is generated, or an element is inserted into the first correlation after the first correlation is generated;
[17.1]	[32.g]	32	wherein the machine readable code, when executed by the one or more processors, causes the one or more processors to further perform at least:
[17.1]	[32.h]	32	modifying: the first one or more instruction sets for operating the first avatar of the application, or a copy of the first one or more instruction sets for operating the first avatar of the application, and
[17.2]	[32.i]	32	wherein the executing the first one or more instruction sets for operating the first avatar of the application includes executing: the

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
			modified the first one or more instruction sets for operating the first avatar of the application, or the modified the copy of the first one or more instruction sets for operating the first avatar of the application, and
[17.3]	[32.j]	32	wherein the performing, by the first avatar of the application or by the second avatar of the application, the one or more operations defined by the first one or more instruction sets for operating the first avatar of the application includes performing, by the first avatar of the application or by the second avatar of the application, one or more operations defined by: the modified the first one or more instruction sets for operating the first avatar of the application, or the modified the copy of the first one or more instruction sets for operating the first avatar of the application;
[18.1]	[33.g]	33	wherein at least a portion of the first correlation is learned in a learning process that includes:
[18.1]	[33.h]	33	operating the first avatar of the application at least partially by: a human user, or a non-human user;
[18.2]	[33.i]	33	generating or receiving the first one or more object representations; and

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
[18.3]	[33.j]	33	obtaining or receiving the first one or more instruction sets for operating the first avatar of the application;
[10]	[34.pre]	34	A method implemented using a computing system that includes one or more processors, the method comprising:
[10]	[34.a]	34	accessing a memory that stores at least a first correlation including a first one or more object representations correlated with a first one or more instruction sets for operating a first avatar of an application, wherein the first one or more object representations represent one or more objects of the application;
[10]	[34.b]	34	generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;
[10]	[34.c]	34	determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations; and
[10]	[34.d]	34	at least in response to the determining, executing the first one or more instruction sets for operating the first avatar of the application,

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
			wherein the first avatar of the application or a second avatar of the application performs one or more operations defined by the first one or more instruction sets for operating the first avatar of the application;
[19.1]	[35.a]	35	a memory that stores at least a first correlation including a first one or more object representations correlated with a first one or more instruction sets for operating a first avatar of an application, wherein the first one or more object representations represent one or more objects of the application;
[19.2]	[35.b]	35	means for generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;
[19.3]	[35.c]	35	means for determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations; and
[19.4]	[35.d]	35	means for executing, at least in response to the determining, the first one or more instruction sets for operating the first avatar of the

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
			application, wherein the first avatar of the application or a second avatar of the application performs one or more operations defined by the first one or more instruction sets for operating the first avatar of the application;
[2.1]-[2.3]	[36.g]	36	wherein the first one or more object representations include: one object representation, a stream of object representations, a collection of object representations, or a stream of collections of object representations, and wherein the second one or more object representations include: one object representation, a stream of object representations, a collection of object representations, or a stream of collections of object representations, and wherein the one or more objects of the application represented by the first one or more object representations are detected at a first time or during a first time period, and wherein the one or more objects of the application represented by the second one or more object representations are detected at a second time or during a second time period;
N/A	“[SUB.1]” [21.h] [22.h]	21-36	wherein the first one or more object representations comprise: a first object representation that represents a first three

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
	[23.h] [24.h] [25.h] [26.h] [27.h] [28.h] [29.h] [30.h] [31.h] [32.k] [33.k] [34.e] [35.e] [36.h]		dimensional (3D) object of the application, and a second object representation that represents a second three dimensional (3D) object of the application, and
N/A	“[SUB.2]” [21.i] [22.i] [23.i] [24.i] [25.i] [26.i] [27.i] [28.i] [29.i] [30.i] [31.i] [32.l] [33.l]	21-36	wherein the first object representation includes a first data structure that:

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
	[34.f] [35.f] [36.i]		
N/A	“[SUB.3]” [21.j] [22.j] [23.j] [24.j] [25.j] [26.j] [27.j] [28.j] [29.j] [30.j] [31.j] [32.m] [33.m] [34.g] [35.g] [36.j]	21-36	is generated at least in response to processing a type and a location of the first 3D object, and
N/A	“[SUB.4]” [21.k] [22.k] [23.k] [24.k] [25.k] [26.k]	21-36	comprises a label indicating the processed type of the first 3D object and a coordinate indicating the processed location of the first 3D object, and

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
	[27.k] [28.k] [29.k] [30.k] [31.k] [32.n] [33.n] [34.h] [35.h] [36.k]		
N/A	“[SUB.5]” [21.l] [22.l] [23.l] [24.l] [25.l] [26.l] [27.l] [28.l] [29.l] [30.l] [31.l] [32.o] [33.o] [34.i] [35.i] [36.l]	21-36	wherein the second object representation includes a second data structure, and

Element number in the Petition	Element number in the Substitute Claims	Claims	Claim Language
N/A	“[SUB.6]” [21.m] [22.m] [23.m] [24.m] [25.m] [26.m] [27.m] [28.m] [29.m] [30.m] [31.m] [32.p] [33.p] [34.j] [35.j] [36.m]	21-36	wherein the first data structure and the second data structure are correlated with the first one or more instruction sets for operating the first avatar of the application.