

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner

v.

AUTONOMOUS DEVICES, INC.,
Patent Owner

Case IPR2023-01055
Patent 11,238,344

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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EXHIBIT LIST

TESLA1001	U.S. Patent No. 11,238,344 to Douglas (“the ’344 Patent”)
TESLA1002	Declaration of Jason Janet, Ph.D.
TESLA1003	Curriculum Vitae of Jason Janet, Ph.D.
TESLA1004	U.S. Patent No. 9,604,359 (“Grotmol”)
TESLA1005	U.S. Patent No. 8,639,644 (“Hickman”)
TESLA1006	Service, Robert F., <i>Minds of Their Own</i> , Sci. Magazine. Oct. 10, 2014, 346(6206):182-183, available at, https://www.usna.edu/AcResearch/_files/documents/Science_Minds_of_Their_own_182.full1.pdf
TESLA1007	Prosecution File History of U.S. Patent No. 11,238,344 (“the ’344 Prosecution History”)
TESLA1008	RESERVED
TESLA1009	<i>Autonomous Devices, LLC v. Tesla, Inc.</i> , Stipulation and Order Granting Leave to File First Amended Complaint and to Amend Scheduling Order, Case No. 22-1466-MN (D. Del.)
TESLA1010	Second Declaration of Dr. Jason Janet
TESLA1011	Transcript of Dr. Eli Saber Deposition in IPR2023-01054
TESLA1012	Transcript of Dr. Eli Saber Deposition in IPR2023-01055
TESLA1013	U.S. Pub. No. 2014/0089232 (“Buibas”)
TESLA1014	Excerpts from Merriam-Websters Dictionary
TESLA1015	U.S. Patent Apl. Pub. No. 2010/0063663 (“Tolstedt”)
TESLA1016	U.S. Patent No. 9,335,766 (“Silver”)

TESLA1017 U.S. Patent No. 9,435,653 (“Zeng”)

TESLA1018 RESERVED

I. INTRODUCTION

The Patent Owner's Response ("**POR**") fails to rebut Petitioner's ("**Tesla**") challenge to claims 3, 6-8, and 10-18 ("**Remaining Challenged Claims**") of the '344 Patent. Patent Owner ("**Autonomous Devices**" or "**PO**") relies on incorrect characterizations of the prior art references (Grotmol and Hickman), an incorrect understanding of the combination of prior art references advanced in the Petition ("**Pet.**"), irrelevant arguments regarding the Petition's stated obviousness rationales, and a range of conclusory assertions from PO's declarant (Dr. Saber) that fail to account for material evidence submitted with the Petition and related teachings in the prior art. As explained in this Reply, PO's arguments are unavailing and the Remaining Challenged Claims should be found unpatentable.

II. GROUND 1: GROTMOL ANTICIPATES CLAIMS 7, 8, AND 16

A. Claim 7

1. PO's Arguments are Based on an Incorrect Understanding of the Claimed "Modifying" Features

PO mischaracterizes Grotmol in arguing that "Grotmol only discloses that a trainer may correct or change the operation of a robot in a 'combiner' situation *by providing additional or new instruction*, ... and not that *the instruction sets that are included with the training sets are actually modified.*" POR, 12; TESLA1010, ¶9.

The Petition cited Grotmol’s teaching that during “supervised training of robots, control instructions (also referred to as corrections) produced by the trainer (e.g., human) may be combined with control instructions produced by the robot controller instructions (predictions).” TESLA1004, 34:49-55; Pet., 27. The notion that the trainer’s corrections do not modify the robot’s existing instruction set is false and inconsistent with Grotmol’s express teachings.

For example, Grotmol discloses at least two training modes where a command issued by a trainer results in a modification of existing instruction sets, namely the “override” and “correct” modes. *See* TESLA1004, 21:64-24:16, Table 3, FIGS. 4b, 18-19. In “override” mode, the robot “Executes the action in accordance with the training input” and “**Learns the association.**”¹ TESLA1004, 22:38-40, Table 3. In particular, “[i]n the override mode, the robot may execute what it has learned, unless a command is sent by the teacher.” *Id.*, 23:13-15. “[I]f the robot is turning left but the teacher wants the robot to turn right and provides a right turn command, [the robot will] perform the action, and try to **remember it for the next time the same situation occurs.**” *Id.*, 23:15-22. In other words, the robot modifies its instruction set responsive to the trainer’s input so that the instructions it originally would have applied to turn left are changed to cause the robot to turn right the next time the same situation occurs. Similarly, “[i]n the correct mode, the robot may integrate what the

¹ All emphasis added unless otherwise noted.

teacher commands with what the robot already knows” by “sum[ming] the teacher’s command with what the robot already knows to get a final motor command.” *Id.*, 23:23-29. In this mode as well, the robot “[l]earn[s] the resulting association” so that the instructions and behavior of the robot would be changed based on the trainer’s corrective input the next time the same situation occurs. *Id.*, 22:40-43, Table 3. PO’s arguments that Grotmol does not modify and then anticipate and executed the modified instruction set is inconsistent with Grotmol’s clear teachings in this regard. TESLA1010, ¶15.

Additionally, although Grotmol’s modifications are not limited to inserting or adding instruction sets, PO’s assertions that such inserting/adding is not “modifying” contradicts the ’344 patent’s description of “modifying” and the plain meaning of the term. POR, 12-17; TESLA1014, 703. In the ’344 patent, “modifying” encompasses operations including additions, deletions, or other alterations. TESLA1001, 140:8-52 (“**Modification Interface 130** comprises the functionality to access, **create, delete, modify[]** ...”), 140:53-141:40 (“**inserting additional code**, overwriting or rewriting existing code, and/or branching to a separate segment of code”), FIGS. 2, 12, 30, 31A, 31B; TESLA1010, ¶¶10-13.

2. Grotmol Discloses the “Modifying” Features Even Under PO’s Understanding of “Modifying”

PO misrepresents Grotmol’s teachings, which, in fact, describe modifying instructions by removing or editing existing instructions without necessarily adding

instructions. POR, 12; TESLA1010, ¶¶14-15. For instance, Grotmol explains that a user can trigger an UNDO operation through which “multiple behaviors (and/or multiple versions of a given behavior)” *are removed* and “[s]imilarly, providing a plurality of UNDO indicating may cause *removal of multiple learned associations*.” TESLA1004, 34:18-35:4. As described above, Grotmol also teaches that “control instructions (also referred to as *corrections*) produced by the trainer (e.g., human) may be combined² with control instructions produced by the robot controller instructions (predictions).” TESLA1004, 34:49-55. Correction inputs can operate “as a deviation from the predicted command determined by the robot.” TESLA1004, 22:1-23:29.

Through operations such as UNDO and other user inputs, Grotmol’s system modifies its instruction sets. As explained in the Petition, Grotmol describes training

² The word “combined” is not limited to “adding,” but can also refer to merging such that user input/instructions to edit or remove an existing instruction, can be merged with the existing instruction to generate updated instructions.

TESLA1014, 204. PO cites to Grotmol’s 34:49-55 in support of its assertion that Grotmol is limited to the addition of new instructions. Not only is there no support for PO’s position in the cited portion, but the words “additional” or “new” are not even recited in this cited portion of Grotmol.

behaviors in a robotic device by “learning of *associations* between sensory context . . . and a respective action . . . during training.” Ex. 1004, 33:59-62; Abstract (“Motor commands *associated with* a given image may be stored.”); *see* Pet., 11-22, 27-31. By removing stored behaviors or learned associations (of images and instructions), the stored instruction sets in Grotmol’s knowledgebase and memory are modified. A POSITA would have understood that these modified instructions are then anticipated and executed in the manner described in the Petition. TESLA1010, ¶¶16-18.

B. Claim 8

PO acknowledges that Grotmol discloses modifying images (circumstance representations), but nonetheless contends that the modified images are not used “in a matching.” POR, 18-19. Incorrect. TESLA1010, ¶20.

For example, the Petition (p. 30) cited Grotmol’s disclosure at col. 3:42-46 that describes “*comparing* individual *scaled* [image] features” and “based on the comparison, *determining a similarity measure for a given training set.*” TESLA1004, 3:42-46. The comparison of “scaled” image features shows that Grotmol’s images are modified to derive features and are used in a matching process.

Further, the Petition cited Grotmol’s disclosure that “pixels from individual image instances are selected, scaled, normalized, and/or equalized.” Pet., 30; *see also* TESLA1004, 30:47-31:2, 4:18-22, 30:54-31:2 31:61-32:5, 3:42-46, 4:58-63;

31:3-8. As Dr. Janet explains, normalization of the images occurs after training is complete. That is, images (circumstance representations) are correlated with instructions, and then normalized. These images are used for matching purposes. *See e.g., Pet., 31, 9, 14-15, 20-22; TESLA1010, ¶21.*

Grotmol provides several examples of how the circumstance representations (images) are modified and used in a matching process. For example, Grotmol discloses that, in performing particle filtering, a robot searches images in the training buffer and *moves individual particles* so that stored images match closely with newly arrived images. TESLA1004, 39:42-54. In the image match process, a windowing function can also be applied to individual images “to *produce [a] windowed image and reduce edge effects.*” TESLA1004, 40:20-51. Grotmol also teaches that an image may be *shifted and trimmed* before matching is performed based on a “pixel-wise difference between the overlapping regions” of the shifted/trimmed images. TESLA1010, ¶¶22-23; TESLA1004, 40:52-41:18; FIGS. 20A, 20B (reproduced below).

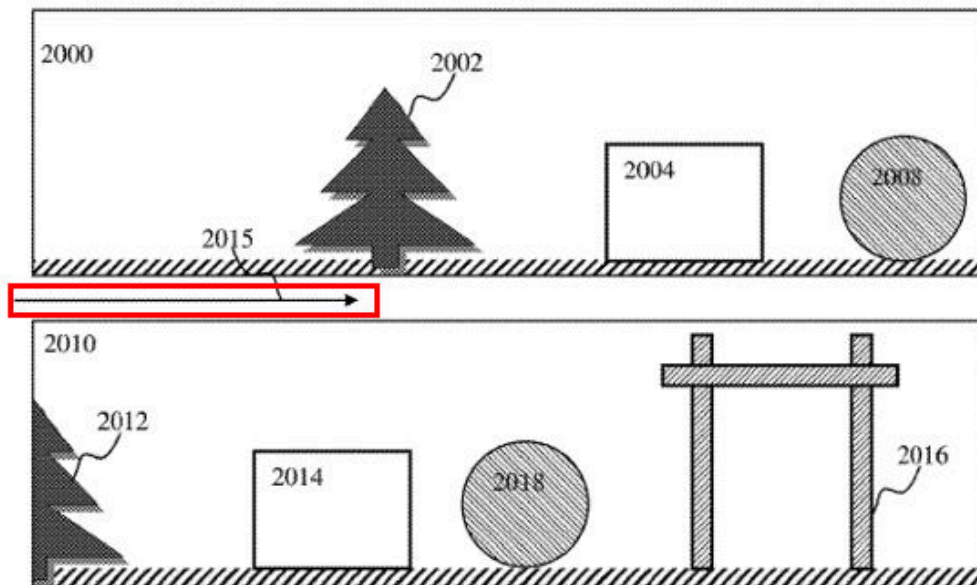


FIG. 20A

Images are shifted
and/or trimmed.

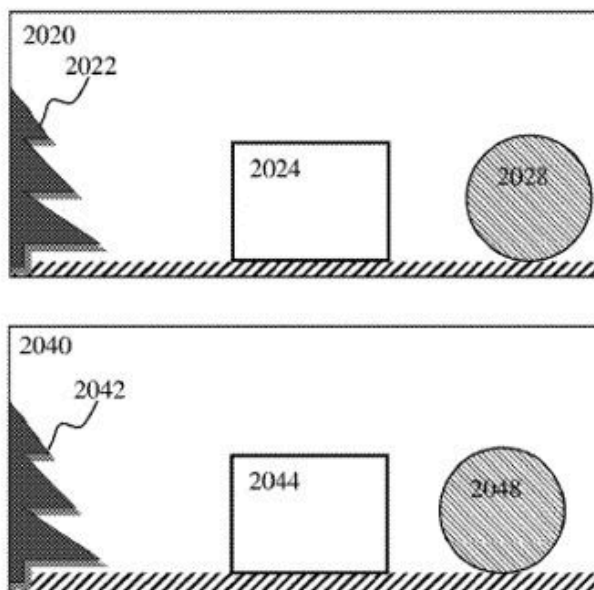


FIG. 20B

TESLA1004, FIGS. 20A, 20B (annotated).

C. Claim 16

PO's argument on claim 16 hinges on its narrow construction of "connection" as "a relationship that includes a *link*." POR, 6-10, 21-22. For the reasons described

further below, however, PO's construction is incorrect and unjustifiably departs from the plain meaning of "connection." Even so, Grotmol discloses the claimed "one or more connections" whether a link is required as argued by PO or not.

1. PO's Overly Narrow Construction of "Connection" Should Be Rejected

PO's construction of "connection" as requiring a "link" should be rejected as unsupported by the intrinsic record of the '974 patent and an unjustified departure from the term's plain and ordinary meaning. *TESLA* 1010, ¶¶24-29. PO admits that its construction is not the plain and ordinary meaning. POR, 22-23 ("Even if Patent Owner's proposed construction is not adopted, moreover, Grotmol fails to disclose the claimed connections under that term's plain and ordinary meaning."). But the record is devoid of any basis for PO's proposed departure from plain meaning. The Federal Circuit has emphasized that "[t]here are only two exceptions" to the "general rule" that "[t]he words of a claim are generally given their ordinary and customary meaning": namely, "1) when a patentee sets out a definition and acts as his own lexicographer," and "2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). Neither condition is satisfied here. Tellingly, PO never argues that the specification or file history contains any relevant lexicography or disavowals. They do not.

PO attempts to import a requirement for a “connection” to include a “link” by mere reference to *examples* in the specification where a “link” is disclosed. POR, 6, 21. For example, PO turns to FIGS. 17 and 18A, which are described as “embodiments.” TESLA1001, 56:29-34; POR, 6-9. But these “embodiments” do not impose a limiting effect. TESLA1010, ¶25. The ’344 patent explains that Model A in FIG. 17 “*may* include a network of Nodes 852 ... and Connections 853 similar to that of a brain.” TESLA1001, 103:49-67. In FIG. 18A, “[e]ach of Connection 853z1 and Connection 853z2 *may* include or be associated with occurrence count, weight, *and/or other parameter or data.*” TESLA1001, 106:19-22. The ’344 patent also states that a “connection *may include or be associated* with at least one of: an occurrence count, a weight, a parameter, or a data.” TESLA1001, 16:5-6. These descriptions include a permissive “may,” and are precisely the type of non-limiting language that does not limit the scope of a claim term. *Aventis Pharma S.A. v Hospira, Inc.*, 675 F.3d 1324, 1330 (Fed Cir. 2012). Notably, the textual description of FIGS. 17 and 18A does not once use the word “link,” which PO seeks to import into the construction of “connections.” TESLA1010, ¶¶26-27; TESLA1012, 12:12-36:5. The specification also broadly describes “connections”—both “direct” and otherwise—at col. 66:13-33 without ever referring to or mandating that a connection include a “link” as proposed by PO. TESLA1001, 66:13-33.

PO cites two dictionary definitions (EX2012, EX2013) as allegedly supporting its construction, each of which provide numerous definitions for “connection.” POR, 10. But PO offers no explanation as to why it cherry-picked one definition involving the word link from the various other available definitions, *particularly when the description in the ’344 patent does not even use the word “link” to describe a “connection.”* TESLA1010, ¶28.

Based on the broad description of the term “connection” in the ’344 patent (see e.g., TESLA1001, 16:5-6, 66:13-33), Petitioner submits that no construction is necessary and that the plain and ordinary meaning should apply. The meaning that most closely aligns with the breadth of this term in the specification is “an association or a relationship.” EX2012, 399-400, EX2013, 481; TESLA1001, 16:5-6, 66:13-33; Pet. 39 (citing TESLA1002, ¶208); TESLA1010, ¶29.

2. Grotmol Discloses the Contested Features of Claim 16, Including the Claimed “Connections”

Under the plain meaning of “connection” as an association or relationship, Grotmol discloses the features recited in claim 16 for the reasons addressed in the Petition. Pet., 38-39. Even PO concedes that Grotmol discloses an “association” between images and instruction sets. POR, 21 (“Grotmol’s disclosure of associations between images and instruction sets ...”), 23 (“An image is ... associated with the motor control command[] ...”).

Even if “connection” were narrowly construed as PO proposes, Grotmol still anticipates claim 16. TESLA1010, ¶32. For example, PO argues that Grotmol does not disclose a relationship that includes a link between an image of an object (such as a ball) and a motor command, and instead teaches “that ‘an acquired image may be compared with one or more images from the training buffer’ *to cause a motor command to be issued.*” POR, 22. PO’s argument does not follow, however, because the motor command would not issue if there was not a connection between such commands (“at least a portion of the first one or more instruction sets for operating the first device”) and the images in the training buffer (“portion of the first one or more object representations”). TESLA1010, ¶¶30-32. Grotmol discloses storing object representations connected to instruction sets as trained behaviors. Ex. 1004, 33:24-27 (“The trained controller of the robot may comprise a trained configuration configured to enable autonomous operation (e.g., without user input) by the robotic device.”), Ex. 1003, 3:27-39 (“[a] given training set may comprise an instance of the video frame[] ... and an instance of a motor control indication configured to cause the robot to execute an action”). TESLA1002, ¶¶ 184-188. The trained behaviors “may be configured based on learning of *associations* between sensory context (e.g., presence of an obstacle in front of the robotic vehicle) and a respective action (e.g., right turn) during training.” *Id.*, 33:59-62, 29:37-30:19, FIGS. 14-15 (depicting connected sets of image features ‘X’ and motor control commands

‘Y’ in training sets of RKNN classifier). Grotmol’s training sets thus clearly connect, and indeed link, images to motor control commands to permit the lookup of such commands based on a matched image. *Id.*

III. GROUND 2: GROTMOL IN VIEW OF THE KNOWLEDGE OF A POSITA RENDERS OBVIOUS CLAIMS 10 AND 11

A. Claim 10

PO argues that “Grotmol fails to disclose the claimed ‘another user’ and ‘another learning process,’” as recited in claim 10, because “Grotmol only discloses *one* user operating *one* device in *one* learning process.” POR, 24-29; TESLA1001, 170:16-37. Not so. PO’s arguments fail at least because they are inconsistent with Grotmol’s teachings and the understanding a POSITA would have of Grotmol’s disclosure, as further corroborated by Dr. Saber during deposition. TESLA1010, ¶34.

The Petition explained that “Grotmol discloses a memory that stores a knowledgebase^[1] including *multiple correlations (training sets)*, where each correlation includes a ‘circumstance representation’^[1] (image of scene from a robot vehicle’s operation) correlated with an ‘instruction set for operation of a first device’^[1] (motor control indication configured to cause the robot to execute an action).” Pet., 12-14, 53; TESLA1004, 3:31-39, Abstract, 8:66-9:3, 10:23-26, 38:36-58, 39:13-22; TESLA1010, ¶35.

Grotmol also discloses that a robot can receive training from different users. For instance, as explained with respect to FIGS. 9, 10A, and 10B (reproduced below), a user can provide inputs to manage robot behavior, e.g., Behavior 1 through Adaptive Controller 1 and Behavior 2 through Adaptive Controller 2. TESLA1004, 25:10-26:48; TESLA1010, ¶36.

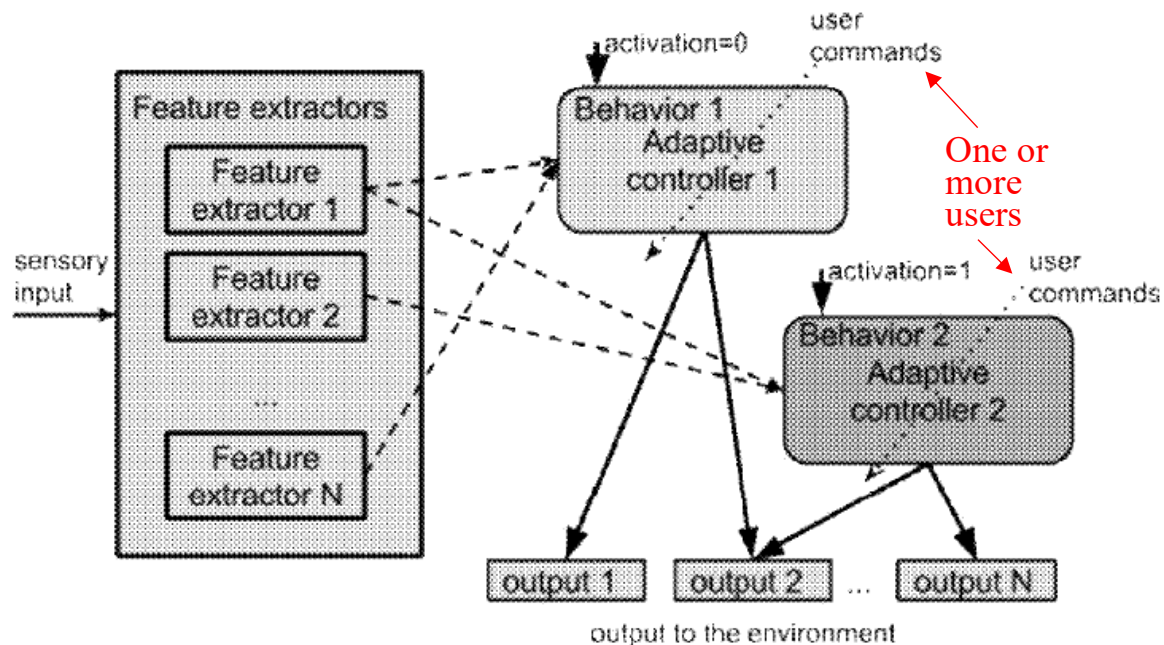


FIG. 10B

TESLA1004, FIG. 10B.

During his deposition, Dr. Saber acknowledged that it would have been understood by a POSITA that user commands can be provided by multiple users such that a robot could be trained by one or more users. TESLA1011, 166:12-18 (“Question: And so these adaptive controllers can receive commands *from different users* and then have the outputs; is that right? [Answer] That's correct. I mean, *you*

receive commands from different users to change a certain behavior or control a certain behavior or adjust it.”) Indeed, Grotmol explicitly discloses that its “BrainOS software platform may be configured to *enable users* to selectively remove a learned behavior.” TESLA1004, 34:18-21; TESLA1010, ¶¶37, 40.

Moreover, Grotmol explains that learning is user dependent. In particular, Grotmol discloses that:

Training of the robot’s controller *may be based on the user observing robot’s actions and sending one or more target control commands to the robot via the training handset. ... The trained configuration may be stored.* A saved configuration may be loaded into the robot being trained thereby *providing one or more trained behaviors to the robot.*

TESLA1004, 33:21-35.

Since Grotmol’s learning is user dependent and Grotmol’s robots can be trained/operated by multiple users, it would have been obvious to a POSITA to implement Grotmol such that multiple users would operate a single robot and train the robot differently according to the users’ instructions. TESLA1010, ¶¶38-39. Indeed, as described in the Petition, it would have been obvious to a POSITA that different trainers could be used to train behaviors involving different levels of complexity to take advantage of the varying skills and knowledge of trainers. Pet.,

53-54; TESLA1002, ¶233; *see also* TESLA1013, [0070]-[0071], [0194]-[0198] (corroborating that a POSITA would have known how to train different robots with different users); *In re Carlson*, 983 F.2d 1032, 1037-38 (Fed. Cir. 1993) (a POSITA “is charged with knowledge of all the contents of the relevant prior art” and “is presumed to know all the pertinent prior art”); *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998).

B. Claim 11

PO incorrectly contends that Grotmol fails to disclose a knowledgebase that includes “instruction sets for operating the third device learned in another learning process,” and “a third circumstance representation correlated with a second one or more instruction sets for operating a third device” because, allegedly, “Grotmol only discloses *one* user operating *one* device in *one* learning process.” POR, 29-34 (emphasis in original); TESLA1010, ¶42. Not so. PO’s argument is premised on an incomplete—and ultimately mistaken—understanding of Grotmol, and fails to place the disclosures cited from Grotmol in the Petition in their proper context.

Contrary to PO’s arguments, Grotmol’s teaching that “[a] trained configuration may be loaded to one or more other robots in order to provide learned behaviors” does not mean that the knowledgebase on a first robot that loads the trained configuration from a second robot would contain *only* the learned behaviors from the second robot. TESLA1004, 33:27-32; Pet., 54-55. Grotmol’s robots

instead use a collection of controllers, each of which provides a trained configuration for one or more different tasks or behaviors learned in a respective learning process. Against this background, a POSITA would have understood Grotmol's disclosure at col. 33:30-32 to mean that a trained configuration containing behaviors learned on a third robot and loaded on a first robot would be implemented alongside the trained configurations for other controllers on the first robot—i.e., controllers that Grotmol expressly discloses can be learned locally through learning processes on the first robot. The result is a knowledgebase on the first robot that includes both correlations learned in a learning process on the first robot *and* correlations learned in another learning process on the third robot (with images (circumstance representations) detected by sensors of the third robot. *See* TESLA1004, FIG. 8 (depicting memory 814 for controllers in knowledgebase), 38:38-42, 3:35-40, 48:9-13, 26:1-2 (“After [the] user is done training a particular behavior, he may create another module and activate it.”), 24:17-25:5 (describing “hierarchical learning”), 26:5-27:42 & FIGS. 9-11 (describing learning processes for multiple behaviors and controllers).

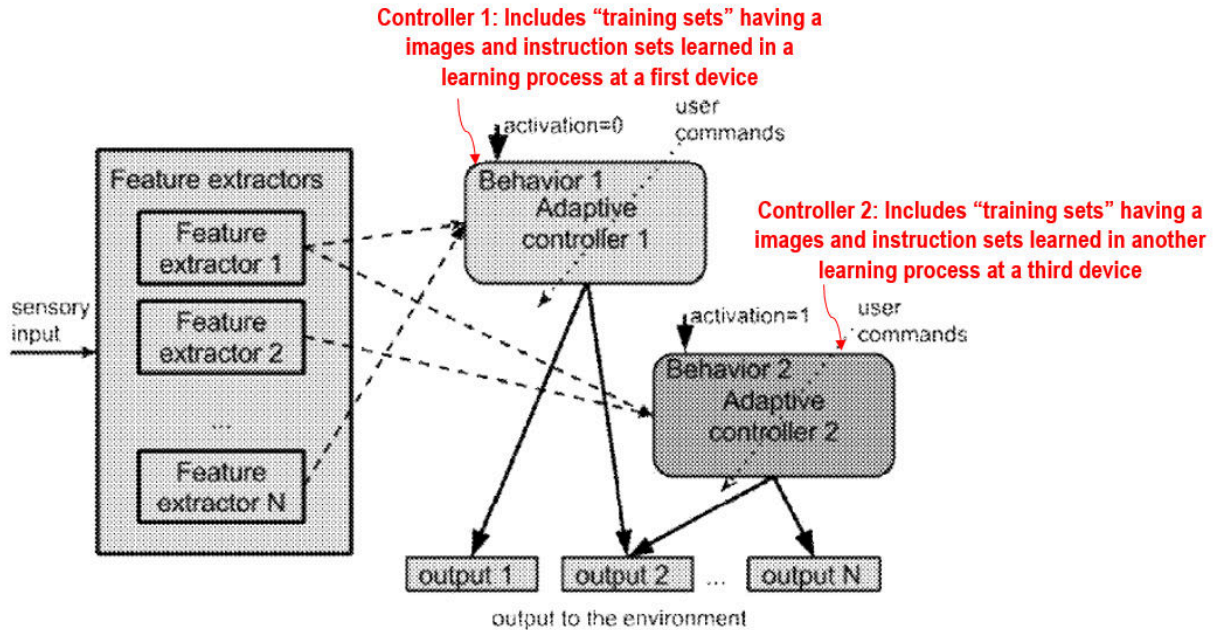


FIG. 10B

TESLA1004, FIG. 10B (annotated).

“Grotmol discloses a memory that stores a knowledgebase^[1] including multiple correlations (training sets), where each correlation includes a ‘circumstance representation’^[1] (image of scene from a robot vehicle’s operation) correlated with an ‘instruction set for operation of a first device’^[1] (motor control indication configured to cause the robot to execute an action).” Pet., 12-14, 53; TESLA1004, 3:31-39, Abstract, 8:66-9:3, 10:23-26, 38:36-58, 39:13-22; TESLA1010, ¶43. Grotmol also discloses that:

Training of the robot’s controller may be based on the user observing robot’s actions and sending one or more target control commands to the robot via the training handset. The trained controller of the robot may

comprise a trained *configuration configured to enable autonomous operation* (e.g., without user input) by the robotic device. *The trained configuration may be stored.* A saved configuration may be loaded into the robot being trained thereby *providing one or more trained behaviors to the robot.* In some implementations, the trained configuration may be loaded *to one or more other robots in order to provide learned behaviors.* *Subsequent to loading* of the saved configuration, *the controller learning process may match process configuration* being present during saving of the configuration.

TESLA1004, 33:21-35.

Grotmol is thus clear that the “trained configuration” that can “be loaded to one or more other robots in order to provide learned behaviors” is a configuration of a “controller.” As discussed, Grotmol’s robots are not limited to a single controller, but instead leverage the capabilities of a hierarchy of controllers to implement a variety of behaviors and perform complex tasks. TESLA1004, 26:1-27:42, 24:17-25:5, FIGS. 9-11. Accordingly, when the trained configuration for a controller learned on a third robot is loaded on a first robot, that trained configuration is provided by a controller that is itself situated among other controllers in the hierarchy utilized by Grotmol’s first robot. TESLA1010, ¶44. Grotmol also teaches that other controllers can be learned in a learning process on the first robot itself such that the

result of loading a trained configuration on a first robot, which has been shared by a third robot, is that the knowledgebase on the first robot would include correlated images and instruction sets learned in learning processes on both the first and third robot (e.g., a so-called “mixed” knowledgebase). TESLA1004, 33:21-30. PO’s arguments entirely disregard these teachings from Grotmol.

Moreover, a POSITA would have understood that the robots do not just share training information (e.g., correlation information) and then do nothing with the received information. Rather, this information is used so that the receiving robot (first device) can benefit from the learning of the transmitting robot (third device) and also perform “learned behaviors.” *See e.g.*, TESLA1005, 11:30-41. Such sharing of learning processes was, in fact, well-known and understood in the art, e.g., as corroborated by Hickman, at least because it allowed “robots to benefit from the collective information learned by many other robots.” TESLA1005, 11:30-41; TESLA1013, [0070]-[0071], [0194]-[0198]. Consistent with this understanding, Grotmol teaches that matching is performed by the first device after performing the loading of the training information received from the third device. TESLA1004, 33:21-35 (“match process configuration”); TESLA1010, ¶¶45-48.

Further, PO’s arguments are based on misrepresentations of Dr. Janet’s testimony. For example, the POR states that “[a]t his deposition, Petitioner’s expert

confirmed that he and Petitioner failed to perform a proper obviousness analysis regarding claim 10 for Ground 2.” POR, 28. False. TESLA1010, ¶49.

In the sections cited by PO, Dr. Janet’s comments are with respect to Ground 3, not Ground 2. EX2008, 93:3-96:9, 99:9-14. In these comments, he certainly did not confirm “that he and Petitioner failed to perform a proper obviousness analysis.” *Id.* Similarly, PO misrepresents 94:20-97:20, 98:16-23 of Dr. Janet’s deposition transcript as evidence that “Dr. Janet stated that he does not believe Grotmol lacks disclosure of any limitations of claim 10.” In this section of the transcript, and in contrast to PO’s characterization, Dr. Janet describes the disclosure of Hickman that he was relying upon in the Grotmol-Hickman combination. TESLA1010, ¶50.

In multiple instances during his deposition, Dr. Janet explained the features of Hickman that he had turned to in the combination Grotmol and Hickman, but PO does not seem to have given Dr. Janet’s answer any weight. *See e.g.*, EX2008, 95:19-24 (“I believe I provided that answer to you just a minute ago, but I will reiterate. So, Hickman has more clarity on the -- this server based knowledge base that can be accessed by multiple robots and multiple users ...”); 97:12-16. At no point did Dr. Janet change his testimony regarding the obviousness challenge to claims 10 and 11. TESLA1010, ¶51.

IV. GROUND 3: THE GROTMOL-HICKMAN COMBINATION RENDERS OBVIOUS CLAIMS 6, 11, AND 12

A. PO Mischaracterizes Hickman’s Organization of Knowledge Bases

PO argues that Hickman would not have been combined with Grotmol because Hickman “stor[es] instruction sets and images *separately in separate knowledgebases* (images in Unique Object Knowledge Base 307 and instructions in Task Knowledge Base 309, *see* Ex. 1005, Fig. 3), which a POS[IT]A would have found to be incompatible with Grotmol’s disclosure of training sets or correlations with images and instruction sets correlated and stored *together*.” POR, 35. Incorrect. TESLA1010, ¶52.

As a preliminary matter, the organization of knowledgebases is not relevant to the combination of Grotmol and Hickman, which integrates Hickman’s teaching of sharing knowledge between different robots through a cloud computing system, and not the organization of various knowledgebases in Hickman. Pet., 55-65. PO’s reliance on other features of Hickman to argue non-obviousness is without merit because “[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference....” *Allied Erecting v. Genesis Attachments*, 825 F.3d 1373, 1381 (Fed. Cir. 2016). Thus, PO’s argument is irrelevant to the asserted combination. TESLA1010, ¶53.

To the extent PO's argument (instruction sets and images are stored *separately in separate knowledgebases*) is considered, PO incorrectly describes Hickman. TESLA1010, ¶54. As shown below, Hickman's FIG. 3 discloses a datastructure 314 for a general object knowledge base 308 (both highlighted in yellow). TESLA1005, 15:28-37. The datastructure 314 includes, among other data, object identifier (GID), image data (IMG), and task data (TASKS). TESLA1005, 15:28-37.

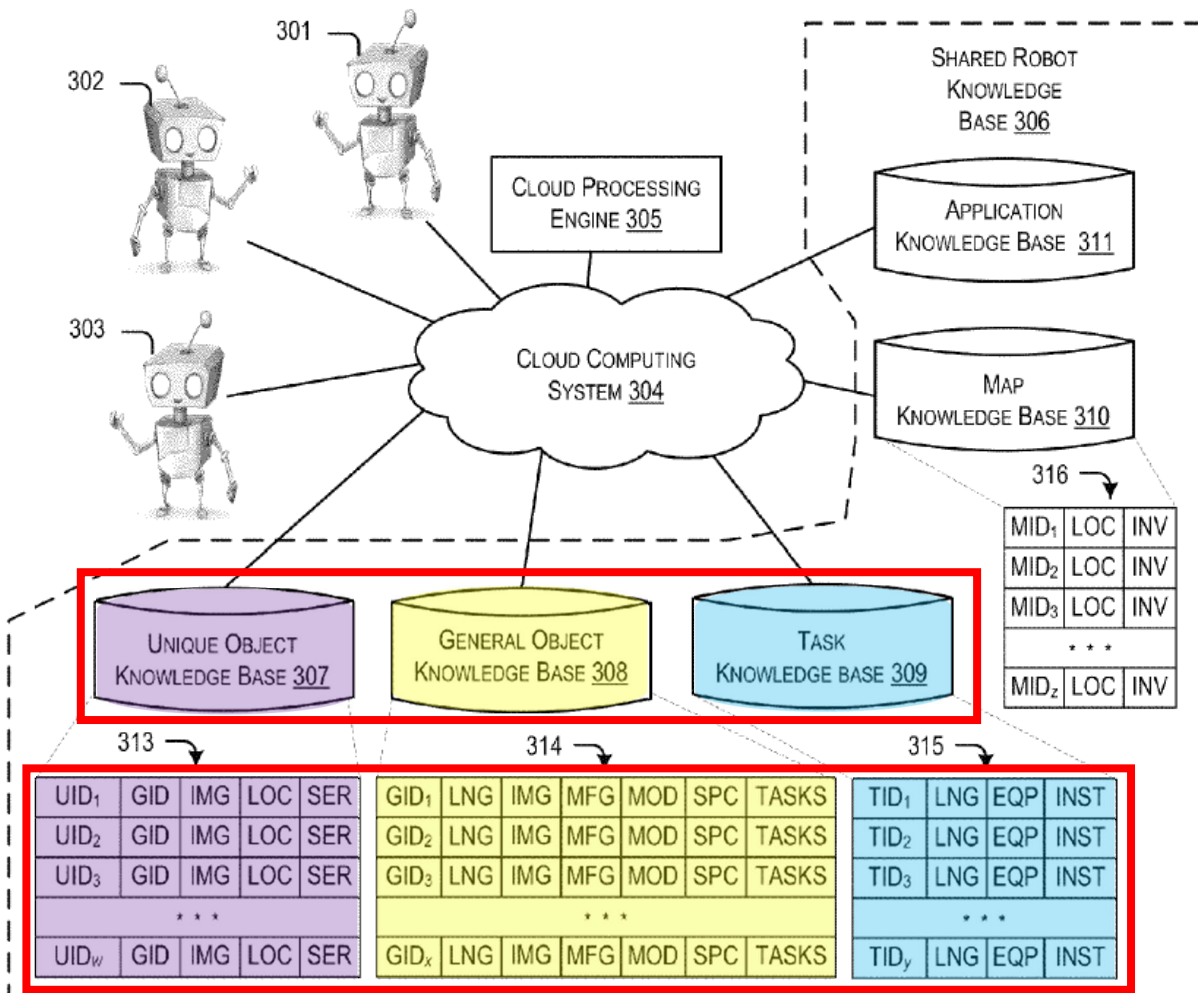


FIGURE 3

TESLA1005, FIG. 3.

The tasks data (TASKS) “may correspond to tasks that can be performed with the object corresponding to the general object identifier (GID);” “defines the types of interactions that a robot may execute with the physical object corresponding to the general object identifier (GID);” and may “include instruction code for controlling and operating” a robot.” TESLA1005, 18:34-19:34. Hickman explains that “[i]n some embodiments where the task data (TASKS) includes robot instruction code for performing tasks, the shared robot knowledge base 304 ***may not require a separate task knowledge base 309***,” but, in other embodiments, the task data “can be looked up in a separate task knowledge base 309.” Thus, Hickman clearly discloses different implementations in which the task data can optionally be included or excluded in the same knowledge base as the images. PO’s argument that Hickman is somehow limited to “storing instruction sets and images separately in separate knowledgebases” contradicts Hickman’s disclosure. TESLA1010, ¶55.

To the extent PO argues that only the unique object knowledge base 307 should be considered in the Grotmol-Hickman combination (which Petitioner does not argue and Petitioner’s combination is not limited to), Hickman teaches that “[v]arious embodiments of the unique object knowledge base 307 may contain more or less data corresponding to a particular unique object identifier (UID). For example, in some embodiments, the unique object knowledge base 307 may have many more additional categories of data 15 than the categories shown in conceptual

data structure 313.” TESLA1005, 12: 5-18. Thus, Hickman’s disclosure, even if limited to the use of the unique object knowledge base 307, would not have taught against the combination of Grotmol and Hickman because Hickman contemplates the addition of other fields to the unique object knowledge base 307 and does not exclude the addition of task data. TESLA1010, ¶56.

B. PO Mischaracterizes Hickman’s Disclosure of Circumstance Representation

PO also argues that “Hickman must disclose the circumstance representations and correlations in order to be combinable with Grotmol” and that “Hickman teaches away from the claimed “circumstance representations” because Hickman focuses on manipulating a single object and single object information and such information is not a circumstance representation.” POR, 35-37, 40.

Again, PO’s argument is irrelevant because the Petition does not rely on Hickman’s disclosure of circumstance representation. TESLA1010, ¶¶57-58.

To the extent PO’s argument is considered, PO’s assertion that Hickman is focused on manipulating a single object is unsupported and unclear³. Hickman, for instance, discloses that “the shared robot knowledge base includes data about a *vast*

³ Consistent with almost all of PO and Dr. Saber’s arguments, there are no citations indicating evidentiary support for their positions. Neither PO nor Dr. Saber explain what a “single object” information and manipulation entails.

number of various objects that robots may encounter and/or interact with in their everyday environments. The shared robot knowledge base *may also include robot instructions for interacting with the objects.*” TESLA1005, 2:48-64, 6:53-57, 4:66-5:2, 8:36-44. Thus, Hickman clearly discloses robot interactions with multiple objects, not just one. TESLA1010, ¶59.

Simply because Hickman organizes its knowledge base by listing objects individually does not mean that Hickman is somehow limited to only interacting with a single object. TESLA1010, ¶¶60-61. In fact, Hickman’s organization of identified objects is similar to the organization of objects in the ’344 patent, which lists individual objects in the Collection of Object Representations 525 (horizontally as opposed to vertically), as shown below in FIG. 4B of the ’344 patent. TESLA1001, 79:58-80:56; *see also* Pet., 11-22, 58-65.

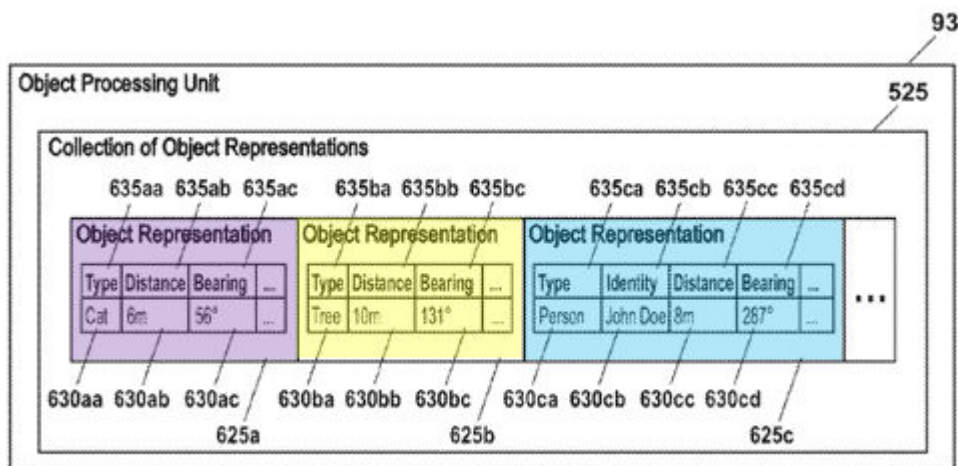


FIG. 4B

TESLA1001, FIG. 4B.

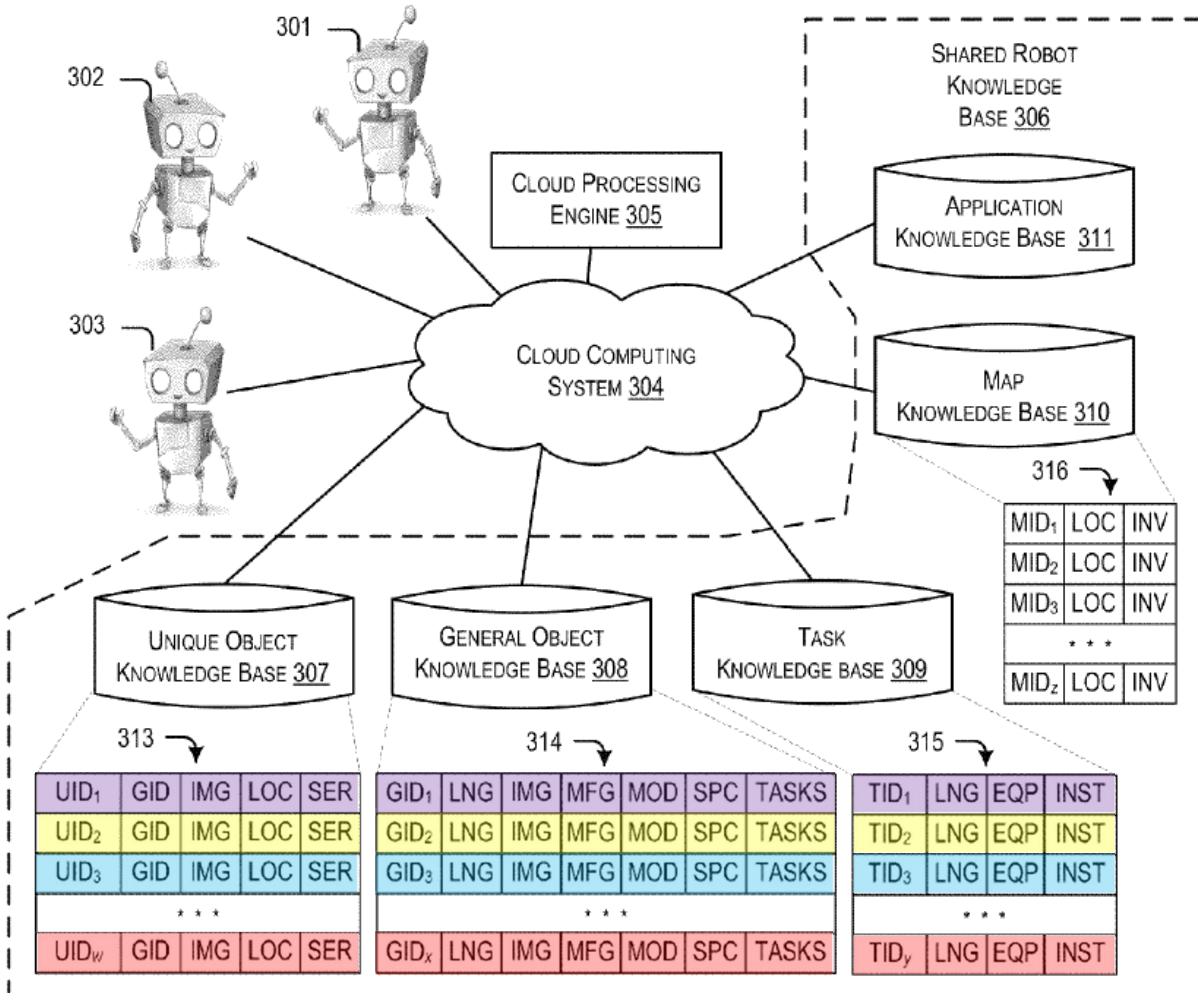


FIGURE 3

TESLA1005, FIG. 3.

C. PO Fails to Rebut the Petition’s Rationale for Combining Grotmol and Hickman

As the Supreme Court held in *KSR Int’l Co. v. TeleflexInc.*, 550 U.S. 398 at 424, 82 USPQ2d 1385 at 1399 (2007), “[t]he proper question to have asked was *whether a pedal designer of ordinary skill*, facing the wide range of needs created by developments in the field of endeavor, *would have seen a benefit* to upgrading

Asano with a sensor.” Similarly, the question here is whether a POSITA would have seen any benefit to combining Grotmol and Hickman.

The Petition provided several reasons why a POSITA would have combined Grotmol and Hickman, and points to explanations in Hickman and a 2014 Science Article that explain the benefits of the Grotmol-Hickman combination. Pet., 55-58. For instance, the Petition explains that shared robot learning would “allow far-flung robots to share those lessons and skills” and distribute computer processing across a cloud computing system, among various other benefits. Pet., 55-58. ***These benefits are entirely un rebutted by PO.*** Indeed, the combination of Grotmol and Hickman is the predictable result of combining prior art elements according to the known methods disclosed in Grotmol and Hickman. PO has no basis for its “hindsight” accusations against Petitioner. POR, 36, 38, 39; TESLA1010, ¶62.

V. CLAIMS 6, 11, AND 12 ARE RENDERED OBVIOUS BY GROTMOL AND HICKMAN

PO’s arguments challenging the obviousness of claims 6, 11, and 12 are deficient for substantially the same reasons addressed above. For instance, PO incorrectly argues that Grotmol is limited to “one user operating one device in one learning process” and that Hickman “discloses only a single object information (not a circumstance representation) and separate (i.e., uncorrelated) instructions that do not disclose a correlation.” POR, 38-59. These two and other PO arguments against

the obviousness of claims 6, 11, and 12 have been rebutted above. TESLA1010, ¶63.

Regarding claim 6, PO also argues that it would not have been obvious for the second device to receive the first circumstance representation or first instruction set for the first device and then perform operations defined by that instruction set because “this requires a sophisticated approach where knowledge is stored and processed using instruction sets correlated with a circumstance representation in a specific manner and ultimately transferred from one device to be used on another device.” POR, 43; TESLA1010, ¶64.

PO’s argument is misplaced because Petitioner’s combination focuses on applying, to Grotmol, Hickman’s suggestion for a cloud computing system that facilitates sharing of information between different robots. The combination does not involve particular types of circumstance representation data being incorporated into Grotmol’s system. And while PO makes a general assertion of “sophistication” implemented in a “specific manner,” neither PO nor its expert provide any description of what that “specific manner” of “sophistication” is. POR, 43. On the contrary, as evidenced by Hickman, the sharing of learned behaviors and instructions was well-known in the art. TESLA1005, 11:30-41. The storage and sharing of circumstance representation along with instruction sets is disclosed by both Grotmol and Hickman. *See e.g.*, TESLA1004, FIGS. 2, 4A, 4B, 3:27-39, Abstract, 8:66-9:3,

10:23-26, 38:36-58, 39:13-22; TESLA1005, FIGS. 3, 4, 13:35-24:64. For the reasons already explained above, PO's statement that "*Hickman fails to disclose any circumstance representations at all*" is incorrect. TESLA1010, ¶¶65-66; Pet., 58-61.

Regarding claim 12, PO's arguments related to the fourth device and fourth circumstance representation mirror the above noted arguments (e.g., arguments related to the third device and third circumstance representation features), and thus fail for the same reasons noted above. POR, 53-59 ("Grotmol and Hickman especially fail to disclose the fourth circumstance representation represents a fourth circumstance detected at least in part by one or more sensors of a fourth device *for similar reasons* and because it requires an additional fourth device."). TESLA1010, ¶67.

VI. THE PETITION CLEARLY SET FORTH THE OBVIOUSNESS RATIONALE FOR GROUNDS 2 AND 3

PO also finds fault in Grounds 2 and 3 because the Petition allegedly does not specify which elements of claims 6, 10, 11, and 12 Grotmol does not disclose, and because Petitioner allegedly failed to provide an articulated reason to support obviousness. POR, 59-62. On the contrary, the Petition sets forth articulated rationales for obviousness in Grounds 2 and 3. *See* Pet., 53-65 (particularly 55, 57, 62). For example, the Petition explains that it would have been obvious to a POSITA

(based on Grotmol in view of the knowledge) to have a second user perform an additional training resulting in an additional correlation stored in the knowledgebase and that the training process involving operation of the different robot could be done by different users. POR, 53-54.

There is no ambiguity in Petitioner's positions. Petitioner (and Dr. Janet) believes Grotmol in view POSITA knowledge renders obvious claims 10 and 11, and claims 6, 10, and 11 are rendered obvious by the Grotmol-Hickman combination. To the extent PO believes claim 11 is not obvious under Ground 2, Petitioner offered a Grotmol-Hickman ground that also renders claim 11 obvious.

Respectfully submitted,

Dated May 30, 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' Reply to Patent Owner's Response totals 5,577, which is less than the 5,600 allowed under 37 CFR § 42.24.

Respectfully submitted,

Dated May 30, 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 May 30, 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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