

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner

v.

AUTONOMOUS DEVICES, INC.,
Patent Owner

Case IPR2023-01054
Patent 10,452,974

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	GROUND 1: GROTMOL ANTICIPATES CLAIMS 4, 5, AND 7	1
A.	Claim 4	1
B.	Claim 5	9
C.	Claim 7	12
1.	PO’s Overly Narrow Construction of “Connection” Should Be Rejected.....	13
2.	Grotmol Discloses the Contested Features of Claim 7, Including the Claimed “Connection[s]”	16
III.	GROUND 2: GROTMOL RENDERS OBVIOUS CLAIM 11	18
IV.	GROUND 3: THE GROTMOL-HICKMAN COMBINATION RENDERS OBVIOUS CLAIMS 4 AND 11.....	21
A.	PO mischaracterizes Hickman’s organization of knowledge bases....	21
B.	PO mischaracterizes Hickman’s disclosure of circumstance representation	24
C.	PO fails to rebut the Petition’s rationale for combining Grotmol and Hickman	27
D.	Claims 4 and 11 are rendered obvious by Grotmol and Hickman.....	27
VI.	PO FAILS TO IDENTIFY ANY MATERIAL DEFICIENCIES IN THE PETITION’S OBVIOUSNESS RATIONALES IN GROUNDS 2 AND 3 ..	28
VII.	CONCLUSION.....	29

EXHIBIT LIST

TESLA1001	U.S. Patent No. 10,452,974 to Cosic (“the ’974 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. 10,452,974 (“the ’974 Prosecution History”)
TESLA1008	U.S. Patent No. 11,238,344 (the “’344 patent”)
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	RESERVED
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	Patent Owner’s Response (Paper 26) in IPR2023-01055 on U.S. Patent 11,238,344

I. INTRODUCTION

The Patent Owner's Response (“**POR**”) fails to rebut Petitioner's (“**Tesla**”) showing in the Petition (“**Pet.**”) that claims 4, 5, 7, and 11 (“**Remaining Challenged Claims**”) of the '974 Patent are unpatentable. 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, 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.

For these and the reasons explained in further detail below, PO's arguments are unavailing and the Remaining Challenged Claims should be found unpatentable.

II. GROUND 1: GROTMOL ANTICIPATES CLAIMS 4, 5, AND 7

A. Claim 4

PO incorrectly contends that “Grotmol fails to disclose that the knowledgebase includes the claimed fourth correlation learned in another learning process involving the second device” because “Grotmol only discloses *one* user operating *one* device in *one* learning process.” POR, 15-19. 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. TESLA1010, ¶9.

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., 27-28. 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 second robot and loaded on a first robot would be implemented alongside the trained configurations for other controllers—i.e., controllers that Grotmol expressly discloses can be learned locally through learning processes on the first robot. TESLA1010, ¶¶10-12, 43-45. The result is a knowledgebase on the first robot that includes both first and second correlations learned in a learning process on the first robot *and* a fourth correlation learned in another learning process on the second robot. *Id.*

In more detail, Grotmol's robots implement complex tasks and behaviors using a collection of "adaptive controllers" stored in memory of the robot.

TESLA1004, FIG. 8 (depicting memory 814), 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). These adaptive controllers contain the “training sets” and correlations between images (e.g., circumstance representations) and motor control indications (e.g., instruction sets) that provide a “knowledgebase” as claimed in certain examples, as described in the Petition. *See* Pet., 12-13 (“Grotmol discloses a memory that stores a knowledgebase[□] including multiple correlations (training sets)[[□] ...”), TESLA1004, 26:5-20, 26:34-37, 27:48-55, 39:13-28, FIG. 15. For instance, the training set in a first controller may include correlations between images and motor commands learned in a first learning process while the training set in a second controller may include correlations between images and motor commands learned in a different, second learning process. This concept is illustrated in FIG. 10B, for example:

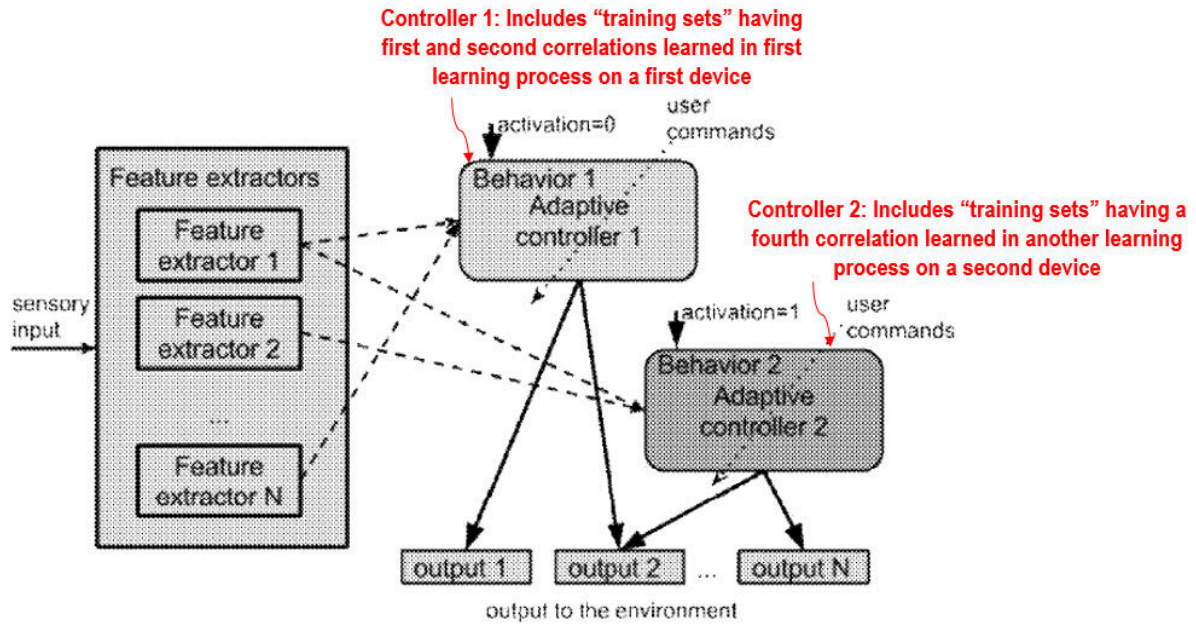


FIG. 10B

TESLA1004, FIG. 10B (annotated).

As noted above, in addressing claim 4, the Petition cites the following disclosure from Grotmol:

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, 33:21-35¹; Pet., 27-28.

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 second 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, ¶¶15-18. 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 second robot, is that the knowledgebase on the first robot would include

¹ All emphasis added unless noted otherwise.

correlated images and instruction sets learned in learning processes on both the first and second robot (e.g., a so-called “mixed” knowledgebase). TESLA1004, 33:21-30.

PO’s arguments entirely disregard that Grotmol’s robots implement multiple controllers and do not properly characterize Grotmol’s disclosure at col. 33. As Dr. Janet explains, a POSITA would have understood Grotmol’s disclosure to mean that the robots do not just share training information (e.g., correlation information) and then do nothing with the received information. TESLA1010, 12. Rather, this information is used so that the receiving (first) robot can benefit from the learning of the transmitting (second) robot and also perform “learned behaviors.” *See e.g.*, TESLA1005, 11:30-41. 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 second device. TESLA1004, 33:32-35 (“match process configuration”). There is no record evidence or suggestion in Grotmol that other controllers, and their trained configurations, are somehow deleted or removed from the knowledgebase whenever a shared training configuration is loaded on a robot. Grotmol’s architecture is instead modular and allows different controllers to be trained, loaded, modified, and run separately from other controllers and their behaviors. TESLA1010, ¶¶16, 13. All training configurations—whether learned locally on the first device or shared by another device—are stored in the same

knowledgebase (e.g., in memory 814) such that the training sets (trained configurations) are all retrievable to enable performance of different trained behaviors on the first device. TESLA1004, FIG. 8, 38:38-42, 3:35-40, 48:9-13.

While different learning processes do not necessarily require different users² (and claim 4 does not specifically refer to multiple users), PO's assertions that Grotmol only discloses "one user" is wrong. POR, 16; TESLA1010, ¶¶16-18. Grotmol in fact 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. As acknowledged by Dr. Saber during his deposition, it would have been understood by a POSITA that the 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

² Claim 11 of related U.S. Patent 11,238,344 (TESLA1008) recites "*another learning process* that includes operating the third device at least partially by: *the user, or another user.*"

certain behavior or adjust it.”) *See, e.g.*, TESLA1013, [0070]-[0071], [0181]-[0184], [0196].

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. Thus, PO’s assertion that Grotmol is limited to “**one** user operating **one** device in **one** learning process” is explicitly contradicted by Grotmol and PO’s own expert.

Dr. Saber’s testimony during his deposition highlighted the lack of support in his and PO’s arguments. For example, during his deposition, Dr. Saber was asked to identify disclosure in Grotmol that teaches that each device is operated by “**one** user” or a “single user” (as alleged by PO), but he was unable to do so. TESLA1011, 185:21-186:5; TESLA1012, 78:15-83:16. Indeed, throughout Dr. Saber’s declaration (EX2007), there is a glaring omission of citations, which reinforces that Dr. Saber and PO’s arguments are not rooted to Grotmol’s disclosure and are conclusory at best. *See e.g.*, EX2007, ¶¶[74], [75], [93], [108].

To the extent PO assumes that even an individual one of Grotmol’s controller’s would not provide the claimed mix of correlations recited in claim 4, this too is incorrect. A single controller on a first robot in Grotmol can contain a training set that includes correlated images and motor commands, a portion of which were learned in a learning process on the first robot and a portion of which were

learned in another learning process on a second robot. TESLA1010, ¶19. This would occur, for example, when the first robot loads a trained configuration shared from a second robot and a user then modifies the trained configuration through additional training on the first robot. PO's and Dr. Saber's overly rigid analyses fail to account for the reasonable inferences that a POSITA would bring to bear in reviewing Grotmol, and they hence follow an approach that is inconsistent with well-established law of anticipation. *See, e.g., In re Predai*, 401 F.2d 825, 826 (CCPA 1968) ("it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom"); *see also Eli Lilly v. Los Angeles Biomedical Research Inst.*, 849 F.3d 1073, 1074-1075 (Fed. Cir. 2017); *In re Graves*, 69 F.3d 1147, 1152 (Fed. Cir. 1995); *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

B. Claim 5

PO's efforts to discredit the Petition's showing that Grotmol anticipates claim 5 fail. To start, PO improperly attempts to import a requirement for "counting" matching portions of circumstance representations in a manner that is not required by the plain language of claim 5. *See* POR, 20-22. PO's arguments thus fail at the outset as they are based on unclaimed features that need not be met by the prior art in the first place. Indeed, the recited language "determining *that* a number [or percentage] of at least partially matching portions" does not necessarily involve

“counting” since the condition can be determined even without a affirmative counting step. TESLA1010, ¶¶21-22.

Regardless, as explained in the Petition, Grotmol discloses that “an acquired image may be compared with one or more images from the training buffer in order to determine the most likely match.” TESLA1004, Abstract, 39:23-64; Pet., 2-3, 15, 28-29. A similarity measure “may be determined by performing pixel-wise difference between the overlapping regions (e.g., the frames 2020, 2040 in FIG. 20B) of the given image and the matching image.” TESLA1004, 41:8-17, 3:50-52, 4:30-39, 47:25-27. Grotmol teaches that “[t]he similarity measure may characterize similarity between features of the subset and features of the given training set.” TESLA1004, 2:30-34. “[R]esponsive to the similarity measure breaching a threshold,” Grotmol’s system “select[s] one or more training sets from the plurality of training sets.” TESLA1004, 4:30-39, 47:4-6; TESLA1010, ¶23. As can be appreciated from the foregoing, Grotmol’s process involves comparing the similarity measure with a threshold, and when that threshold is exceeded by the similarity measure (“a number of at least partially matching portions ... exceeds a threshold number”), the system has determined that a number (e.g., 1) of at least partially matching portions of the new image (e.g., the third circumstance representation) and portions of the training set image (e.g., first circumstance representation) exceeds a threshold number (e.g., 0). TESLA1004, 4:30-39, 47:4-6; TESLA1010, ¶24.

Moreover, the Petition specifically cited Grotmol's disclosure that "shifted/trimmed" portions of a new image (corresponding to portions of a "third circumstance representation") are compared to "shifted/trimmed" portions of a subset of images from the training set (referred to in Grotmol as "the matching search set," which correspond to a "first circumstance representation") to determine a "best match" from the training set. TESLA1004, 41:8-17; Pet. 29; TESLA1010, ¶25. According to Grotmol, the "shifted/trimmed frames" for which a similarity metric is determined are "at least partially matching portions." For example, Grotmol describes how an "image correlation operation" is performed with the new image and each candidate image in the matching search set to align the new image with each candidate image before the pixel-wise difference is determined between the images. TESLA1004, 40:52-41:16, FIGS. 20A, 20B (depicting shifted/trimmed frames). Through the image correlation operation and the resulting shifting/trimming of correlated frames, a POSITA would have understood that Grotmol only selectively performs the pixel-wise difference comparison between "portions" of a new image and images in a pre-determined "matching" search set, i.e., between "*at least partially matching portions* of the third circumstance representation and portions of the first circumstance representation," as recited in claim 5. TESLA1004, 40:52-55; *see also id.*, 39:23-40:63, 40:67-41:7 ("Variability between matching images may exist."); TESLA1010, ¶26.

Grotmol also teaches that determining a “best match” between a new image and an image in the “matching search set” involves determining that a number of shifted/trimmed portions of the new image (i.e., at least partially matching portions) exceeds a threshold. The threshold that must be exceeded is either (a) zero when a “best match” is determined with a portion of an image from a “primary particle” of the matching search set or (b) one or more depending on the window size when a “best match” is determined with a portion of an image from a “secondary particle” set. TESLA1004, 31:43-42:2 (“[I]f a match search set image with the best match score (e.g., the lowest norm) belongs to the primary particle set than it may be selected as the best match. If the image with the best match score belongs to the secondary particle set than it may be selected based on an evaluation of image history parameter.”). Grotmol thus plainly discloses “determining that a number [or percentage] of at least partially matching portions of the third circumstance representation and portions of the first circumstance representation exceeds a threshold number [or percentage],” as recited in claim 5. TESLA1010, ¶27.

C. Claim 7

Claim 7 recites, *inter alia*, “wherein a **first connection** is generated to connect the first correlation with the second correlation, and wherein a **second connection** is generated to connect the second correlation with the fourth correlation.” TESLA1001, 170:63-67.

PO seeks to distinguish the claimed features over Grotmol by advancing a narrow construction of the term “connection” as a “relationship that includes a link.” POR, 10. For the reasons described further below, however, PO’s construction is incorrect and unjustifiably departs from the plain meaning of “connection.” TESLA1010, ¶¶28-29. Even so, Grotmol discloses the claimed first and second connections whether or not a link is required, as argued by PO.

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. TESLA1010, ¶¶30-35. In its POR in related proceeding IPR2023-01055 (involving a continuation of the ’974 patent), PO advanced the same construction of “connection” and conceded that its construction is *not* the plain and ordinary meaning. TESLA1018, 22-23 (“Even if Patent Owner’s proposed construction is not adopted, ... Grotmol fails to disclose the claimed connections under the 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, and tellingly, the POR never once even attempts to argue that the specification or file history contains any relevant lexicography or disavowals. They do not.

PO instead 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. EX2007, ¶¶55-62; POR, 11. But even these examples are not specifically described in terms of “connections.” TESLA1010, ¶¶30-31. For example, PO turns to FIGS. 17 and 18A, which are described as “embodiments,” and which do not impose a limiting effect. TESLA1001, 56:17-23. The ’974 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, 103:42-51. 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, 106:11-14. The ’974 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, 15:58-60. 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 “connection.” The specification also broadly describes “connections”—both “direct” and otherwise—at col. 66:3-23 without every referring to or mandating that a connection include a “link” as proposed by PO. TESLA1001, 66:3-23.

In addition to the lack of support, PO’s construction is problematic because PO’s construction includes the term “link”—the meaning of which is unclear. The ’974 patent does not define a link, and during his deposition, PO’s expert likewise failed to define or clarify what the meaning of “link” over almost 40 minutes of questioning. TESLA1012, 12:12-36:5; TESLA1010, ¶¶32-33.

PO cites two dictionary definitions (EX2012, EX2013) as allegedly supporting its construction, each of which provide numerous definitions for “connection.” POR, 14. 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 ’974 patent does not even use the word “link” to describe a “connection.”* Even if a connection may include a link in some contexts, there is no basis in the specification, file history, or otherwise for limiting a connection to a “relationship that includes a link” as PO contends.

Based on the broad description of the term “connection” in the ’974 patent (see e.g., TESLA1001, 15:58-60, 66:3-23), 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 intrinsic record is “an association or a relationship.” EX2012, 399-400, EX2013, 481; TESLA1001, 15:58-60, 66:3-23; TESLA1010, ¶¶34-35.

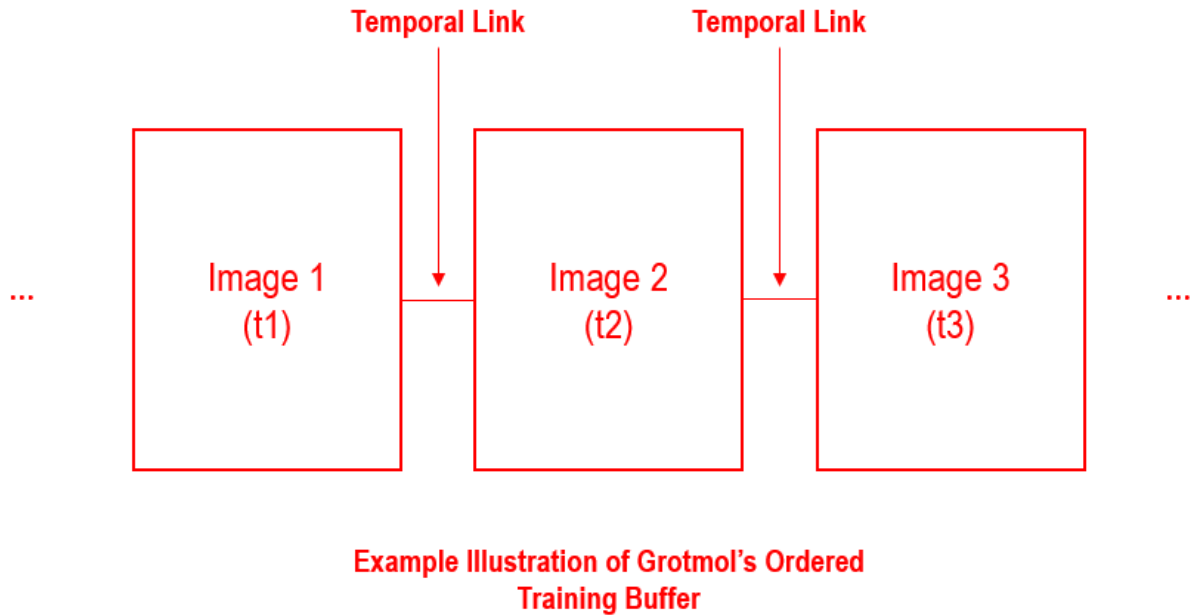
2. Grotmol Discloses the Contested Features of Claim 7, Including the Claimed “Connection[s]”

Grotmol discloses the claimed connections. TESLA1010, ¶¶36-40. As explained in the Petition, Grotmol describes storing correlations including sequences of images with their corresponding instruction sets (i.e., a sequence of knowledge cells), and that the training buffer may be ordered temporally, according to when the images were acquired. Pet., 32-33, TESLA1004, Abstract, 38:21-42, 39:17-40:19. Because storing data in a sequential manner in a memory creates an association or relationship between the stored data, e.g., based at least on the sequential storage locations, Grotmol discloses the claimed “first connection” and “second connection.”

To be sure, the connections generated by storing sequences of images with their corresponding instruction sets in a temporally ordered training buffer allow Grotmol’s control process to efficiently identify an image stored in the training buffer as a “best match” to a new image captured during autonomous operation. *See* TESLA1004, 39:23-48. The sequence of images stored in Grotmol’s ordered training buffer serve to connect images that are temporally proximate to a limited number of “particle” images. *Id.* Grotmol’s control process uses these temporal

connections to narrow the search space and more efficiently identify a matching image from the training set. *Id.* The training buffer also connects the correlations in Grotmol since Grotmol's images are correlated with motor control indications (e.g., instruction sets). *See* Pet., 12-15; TESLA1010, ¶¶39-40.

Further, even if a “connection” required a link as urged by PO (which it does not), a POSITA would have understood the connections provided by Grotmol's ordered training buffer to link temporally proximate images (e.g., to a particle image). TESLA1010, ¶40. If the images in the buffer were not linked, temporally proximate images would not be identified as they are in Grotmol. As noted above, Dr. Saber was unable to offer any clear description of what a “link” actually is under cross-examination (TESLA1012, 12:12-36:5) or how it allegedly must be manifested in practice, but one can easily “draw” a link to conceptually illustrate the connection between images in Grotmol's ordered buffer similarly to the conceptual links that PO contends exist in the figures of the '974 patent:



III. GROUND 2: GROTMOL RENDERS OBVIOUS CLAIM 11

As a preliminary matter, PO's arguments regarding claim 11 are similar to PO's arguments for claim 4, and thus fail for similar reasons as noted above with respect to claim 4. POR, 26-34; TESLA1010, ¶42. For example, to the extent not expressly disclosed, it further would have been obvious to a POSITA reviewing Grotmol that sharing a trained configuration of a controller would provide the mix of first, second, and fourth correlations learned by at least two learning processes as recited in claim 11. *Supra*, Section II.A.

PO further contends that claim 11 is not obvious due to the "at least partially by another user" limitation. POR, 26-27; TESLA1011, 166:12-18. Wrong. TESLA1010, ¶43. Dr. Saber conceded during his deposition that it would have been understood to a POSITA for user commands in Grotmol to 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.”) See, e.g., TESLA1013, [0070]-[0071], [0181]-[0184], [0196].

Further, as explained above in Section II.A, Grotmol teaches that a second device can provide training information and learned behaviors for loading onto the first device. TESLA1004, 33:21-35. Grotmol discloses that different types of robots (e.g., rovers, bi-pedaling robots, wheeled vehicles, aerial drones, robotic limbs, and/or other robotic devices) can be used, and that each robot has a trainer/user. TESLA1004, title, 34:49-39:22, 16:4-8, 18:33-37, FIG. 1. Grotmol also discloses that a “trainer may be provided with the control of the robot during training.” TESLA1004, 34:49-62, 23:3-11, 39:13-22. It would therefore have been obvious to a POSITA that when there are multiple robots, particularly different types of robots, they can be trained by different trainers. TESLA1004, 18:33-37, 35:5-25, 34:18-21; TESLA1010, ¶¶44-45.

PO attacks Dr. Janet’s testimony by alleging that he did not perform a proper obviousness analysis. POR, 33-35. These attacks are based on misrepresentations of Dr. Janet’s testimony. TESLA1010, ¶46.

In his declaration, Dr. Janet presented his opinion on the obviousness of claim 11 in view of Grotmol. TESLA1002, ¶[140]. Instead of focusing on his obviousness remarks, PO's counsel asked him why claim 11 was not anticipated. EX2011, 61:7-62:15. Dr. Janet responded by indicating that at the time of drafting his declaration, he felt that Grotmol should "be supplemented by what a person of ordinary skill would know," e.g., the role a different user would play. EX2011, 61:7-62:15. Dr. Janet explicitly stated, "to me it's [(claim 11)] comfortably in this second ground [(obviousness)], but I think plausibly in the first [(anticipation)]." EX2011, 63:1-7. Simply because Dr. Janet considered an anticipation ground as "plausible," does not mean that his obviousness analysis provided in his first declaration is incorrect.

Moreover, Dr. Janet explained to PO's counsel that "even if it [(Grotmol)] has to be elaborated on by what a person of ordinary skill in the art would know, yes, I believe that Grotmol discloses the elements of limitations of claim 11." EX2011, 63:18-23. Thus, Dr. Janet, who is not a legal expert, was attempting to explain to PO's counsel that he believed Grotmol was a strong reference and that in combination with the knowledge that a POSITA has, would render claim 11 obvious by disclosing all its claimed features. TESLA1010, ¶¶46-47; *See e.g.*, EX2011, 69:13-20. At no point did Dr. Janet change his testimony regarding the obviousness challenge to claim 11 or the mapping of Grotmol applied to claim 11. EX2011, 72:22-73:2 ("I'm relying on obviousness in Ground 2, yes.").

IV. GROUND 3: THE GROTMOL-HICKMAN COMBINATION RENDERS OBVIOUS CLAIMS 4 AND 11

A. PO mischaracterizes Hickman's organization of knowledge bases

PO errs in arguing that Hickman is incompatible with Grotmol because Hickman “stor[es] instruction sets and images *separately in separate knowledgebases*, ... 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; ; TESLA1010, ¶48.

As a preliminary matter, the organization of knowledgebases is not relevant to the combination of Grotmol and Hickman, which more generally applies Hickman's teachings of facilitating knowledge sharing among different robots through a cloud computing system and does not rely on the specific organization of knowledgebases in Hickman. Pet., 58-61. 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, ¶49.

To the extent PO's argument is considered, PO incorrectly describes Hickman. TESLA1010, ¶50. As shown below, Hickman's FIG. 3 discloses a data structure 314 for a general object knowledge base 308 (both highlighted in yellow).

TESLA1005, 15:28-37. The data structure 314 includes, among other data, object identifier (GID), image data (IMG), and task data (TASKS). TESLA1005, 15:28-37.

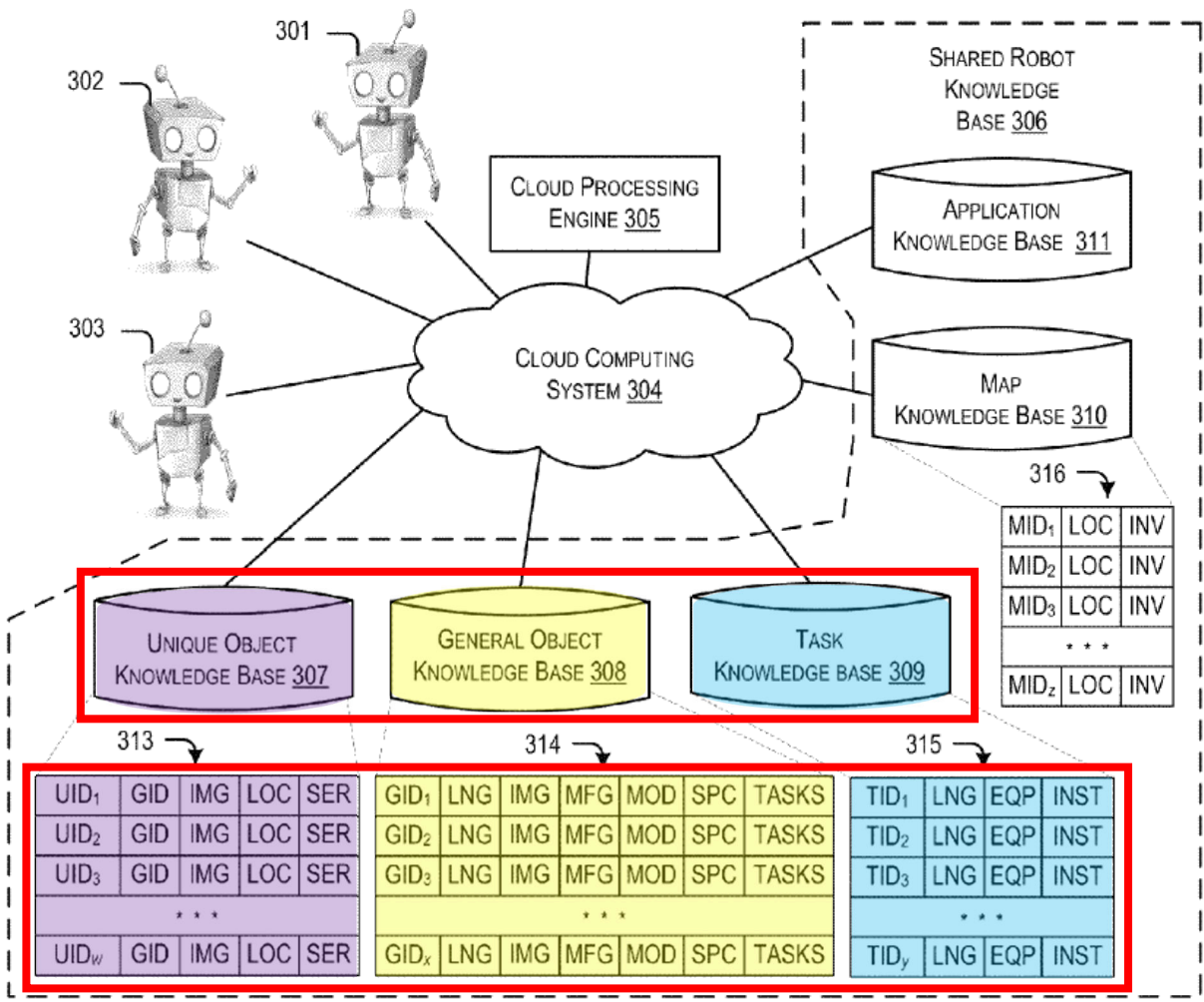


FIGURE 3

TESLA1005, FIG. 3 (annotated).

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, ¶51.

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, ¶52.

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 circumstance representations “by disclosing single object information (the information about the single object being manipulated in Hickman), which is not a circumstance representation.” POR, 35-37; TESLA1010, ¶53.

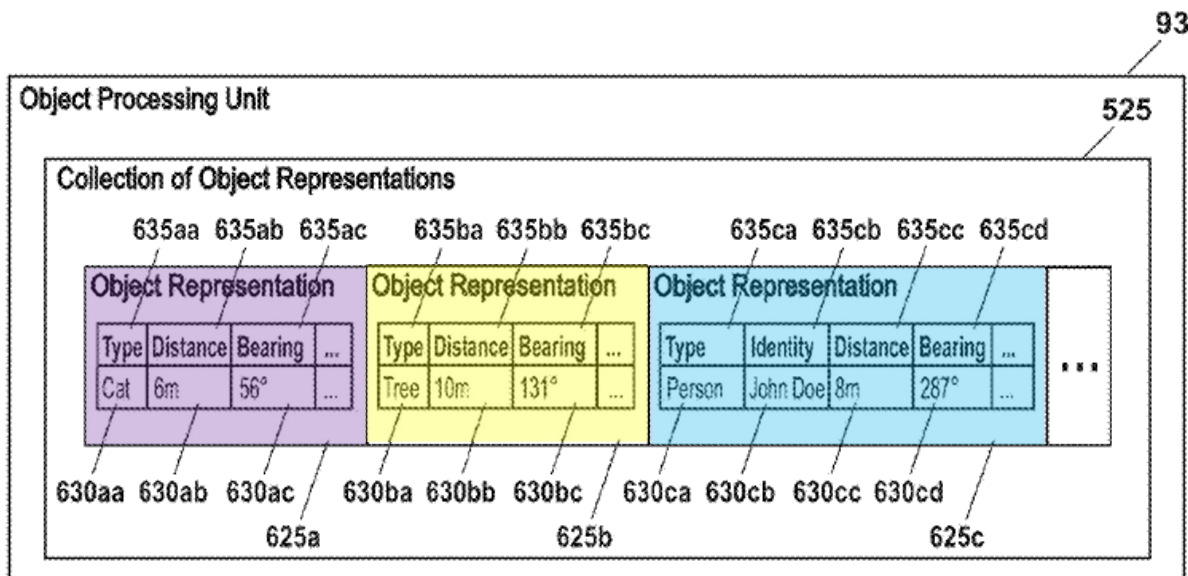
Again, PO’s argument is immaterial because the Petition does not rely on Hickman’s disclosure of circumstance representation. TESLA1010, ¶54.

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 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*

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.

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, ¶55.

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. In fact, Hickman’s organization of identified objects is similar to the organization of objects in the ’974 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 ’974 patent. TESLA1001, 71:38-73:12; TESLA1010, ¶56.



TESLA1001, FIG. 4B.

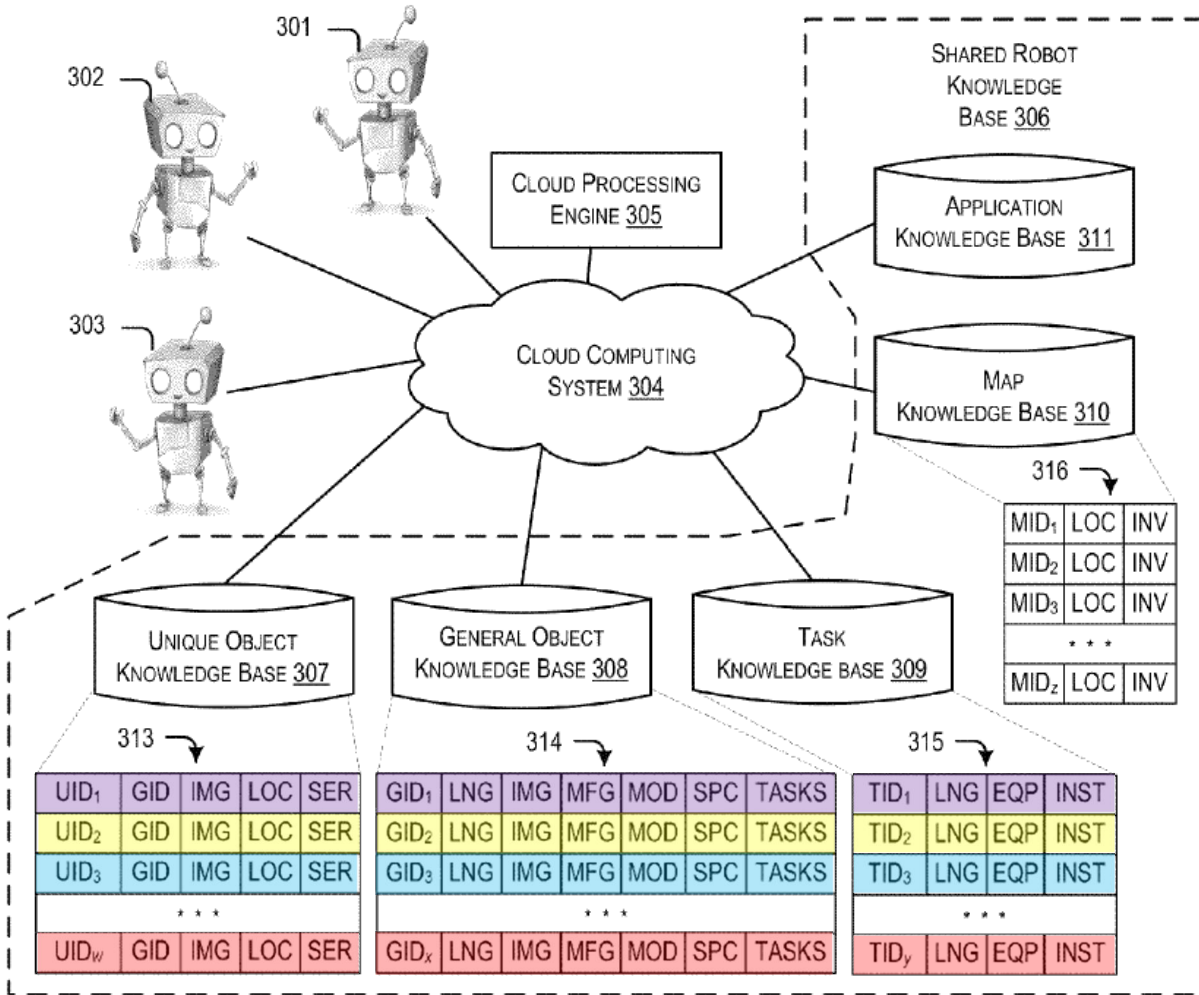


FIGURE 3

TESLA1005, FIG. 3.

PO makes blanket assertions (without evidentiary support) that Hickman does not teach circumstance representations, but fails to explain how Hickman's various knowledge bases that include object identification information, images, tasks, and more, as explained above and shown in FIG. 3, do not disclose circumstance representation (notwithstanding Grotmol's disclosure of circumstance

representation, as described in the Petition). POR, 35-37; Pet., 11-20, 25-28; TESLA1010, ¶51.

C. PO fails to rebut the Petition’s rationale for combining Grotmol and Hickman

PO does not rebut or provide any evidence that the Petition’s combination rationale was incorrect or unsupported. TESLA1010, ¶58. 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., 58-61. For instance, Petitioner 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., 58-61. These benefits, which are motivations for a POSITA to combine Grotmol and Hickman, are entirely unrebutted by PO. As such, PO has no basis for its “hindsight” accusations against Petitioner. POR, 39.

D. Claims 4 and 11 are rendered obvious by Grotmol and Hickman

PO’s arguments challenging the obviousness of claims 4 and 11 in Ground 3 are substantially the same as those that have already been addressed above in Grounds 1 and 2. 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, 41-56. These two and other arguments that PO relies on to argue against the obviousness of claims 4 and 11 have been rebutted above. TESLA1010, ¶59.

VI. PO FAILS TO IDENTIFY ANY MATERIAL DEFICIENCIES IN THE PETITION’S OBVIOUSNESS RATIONALES IN GROUNDS 2 AND 3

PO’s criticisms of the obviousness rationales in Grounds 2 and 3 are unfounded. Contrary to PO’s allegations that the Petition does not specify which elements of claims 4 and 11 are not disclosed by Grotmol for purposes of the obviousness analysis (POR, 56-61), the Petition clearly identifies the features it deems are rendered obvious by reference to a POSITA’s knowledge or the teachings of Hickman under Grounds 2 and 3. *See* Pet., 56-57, 61, 64-65. There is no ambiguity in Petitioner’s positions and grounds. Petitioner (and Dr. Janet) believe claim 4 can be anticipated by Grotmol alone, hence claim 4 is challenged under Ground 1. To the extent PO believes Grotmol does not anticipate claim 4, Petitioner offers a second ground that renders claim 4 obvious.

A similar rationale applies to claim 11. Petitioner (and Dr. Janet) believe Grotmol in view POSITA knowledge renders obvious claim 11. To the extent PO believes Grotmol does not render obvious claim 11, Petitioner offers a Grotmol-Hickman ground that renders claim 11 obvious.

VII. CONCLUSION

For all the foregoing reasons, Petitioner respectfully submits that the Board should find the Remaining Challenged Claims unpatentable.

Respectfully submitted,

Dated May 30, 2024

/Usman Khan/
W. Karl Renner, Reg. No. 41,265
Nicholas Stephens, Reg. No. 55,402
Usman A. Khan, Reg. No. 70,439
Matthew Colvin, Reg. No. 75,201
Fish & Richardson P.C.
3200 RBC Plaza, 60 South Sixth Street
Minneapolis, MN 55402
T: 202-783-5070
F: 877-769-7945

Attorneys for Petitioner

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 5,578, which is less than the 5,600 allowed under 37 CFR § 42.24.

Respectfully submitted,

Dated May 30, 2024

//Usman Khan/
W. Karl Renner, Reg. No. 41,265
Nicholas Stephens, Reg. No. 55,402
Usman A. Khan, Reg. No. 70,439
Matthew Colvin, Reg. No. 75,201
Fish & Richardson P.C.
3200 RBC Plaza, 60 South Sixth Street
Minneapolis, MN 55402
T: 202-783-5070
F: 877-769-7945

Attorneys for Petitioner

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:

Arvind Jairam Reg. No. 62,759
John Holley Reg. No. 65,683
Stuart McCommas Reg. No. 71,834
MCKOOL SMITH, P.C.
1999 K St. NW, Suite 600
Washington, DC 20006
Telephone: (202) 370-8300
Facsimile: (202) 370-8344

George Fishback Reg. No. 76,345
MCKOOL SMITH, P.C.
303 Colorado Street, Suite 2100
Austin, TX 78701
Telephone: (512) 692-8700
Facsimile: (512) 692-8744

E-mail: Autonomous_IPRs@mckoolsmith.com

/Crena Pacheco/

Crena Pacheco
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
pacheco@fr.com