

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner,

v.

AUTONOMOUS DEVICES, LLC,
Patent Owner.

IPR2024-00745
Patent 11,663,474 B1

Before ROBERT J. WEINSCHENK, TERRENCE W. McMILLIN, and
RUSSELL E. CASS, *Administrative Patent Judges*.

CASS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Tesla, Inc. (“Petitioner”) filed a Petition (Paper 2 (“Pet.”)) requesting *inter partes* review of claims 45–47, 51, 56, 57, 59, 60, 68, and 69 of U.S. Patent No. 11,663,474 B1 (Ex. 1001, “the ’474 patent”). Autonomous Devices, LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With authorization, Petitioner filed a Preliminary Reply (Paper 7 (“Prelim. Reply”)), and Patent Owner filed a Preliminary Sur-reply. Paper 8 (“Prelim. Sur-reply”).

We have authority under 35 U.S.C. § 314 and 37 C.F.R. § 42.4 to determine whether to institute an *inter partes* review. An *inter partes* review may not be instituted unless it is determined that “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314 (2018); *see also* 37 C.F.R. § 42.4(a) (2020) (“The Board institutes the trial on behalf of the Director.”). The reasonable likelihood standard is “a higher standard than mere notice pleading,” but “lower than the ‘preponderance’ standard to prevail in a final written decision.” *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 13 (PTAB Dec. 20, 2019) (precedential).

For the reasons provided below and based on the record before us, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims. Accordingly, we institute an *inter partes* review on all grounds set forth in the Petition.

II. BACKGROUND

A. Real Parties-in-Interest

Petitioner identifies itself as the real party-in-interest. Pet. 89. Patent Owner names itself as the real party-in-interest. Paper 3, 1.

B. Related Matters

The parties inform us that the '474 patent was asserted in *Autonomous Devices LLC v. Tesla, Inc.*, No. 22-cv-1466 (MN) (D. Del.). Pet. 89; Paper 3, 1. The parties also state that Petitioner has filed IPR proceedings against other patents owned by Patent Owner, including IPR2023-01054, 2023-01055, IPR2023-01169, IPR2023-01172, and IPR2023-01173. Pet. 90, Paper 3, 2.

C. The '474 Patent

The '474 patent is titled “Artificially Intelligent Systems, Devices, and Methods for Learning and/or Using a Device’s Circumstances for Autonomous Device Operation.” Ex. 1001, code (54). The '474 patent is directed to “devices, apparatuses, systems, and related methods for providing advanced learning, anticipating, decision making, automation, and/or other functionalities.” *Id.* at 1:28–32. The '474 patent describes artificially intelligent devices, systems, and methods

that enable learning a device’s circumstances including objects with various properties along with correlated instruction sets for operating the device, storing this knowledge in a Knowledgebase (i.e. neural network, graph, sequences, etc.), and operating a device autonomously.

Id. at 57:66–58:7.

Figure 2 of the '474 patent is depicted below.

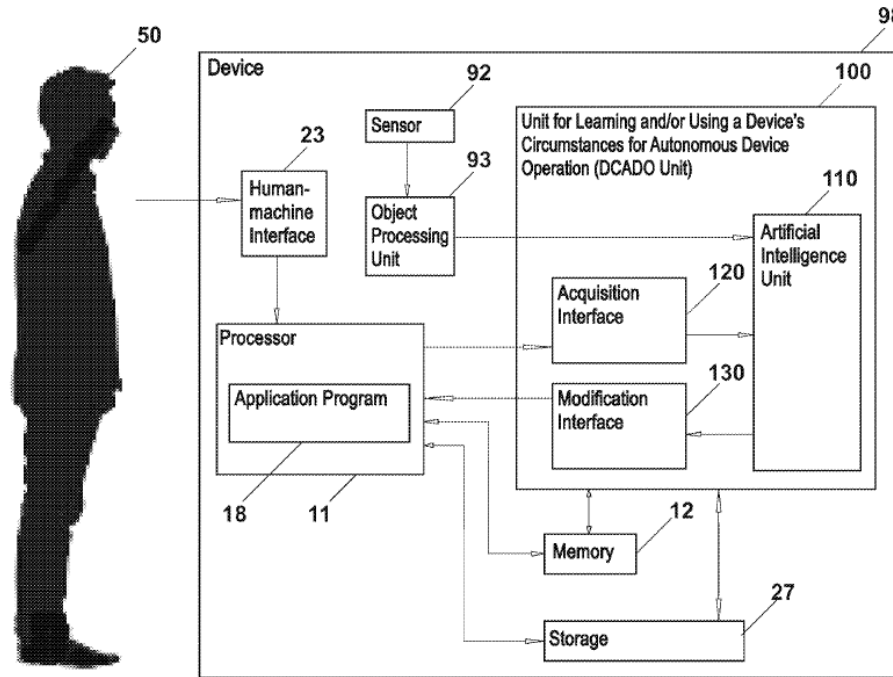


FIG. 2

Figure 2 illustrates an embodiment of device 98 comprising a “Unit for Learning and/or Using a Device’s Circumstances for Autonomous Device Operation” (DCADO Unit) 100, processor 11, human-machine interface 23, sensor 92, object processing unit 93, memory 12, and storage 27. *Id.* at 67:6–11.

Processor 11 is configured to execute instruction sets for operating the device. Ex. 1001, 67:22–25. User 50 issues an operation direction to application program 18 responsive to which application program’s 18 instructions or instruction sets are executed by processor 11 to perform a desired operation on device 98. *Id.* at 68:41–45. Sensor 92 “comprises the functionality for obtaining or detecting information about [the sensor’s] environment” and “can be used to detect objects and/or their properties” near device 98. *Id.* at 69:19–24. Object processing unit 93 “comprises the functionality for processing output from [s]ensor 92” and can be used “to

detect objects and/or their properties.” *Id.* at 71:53–58. DCADO Unit 100 comprises artificial intelligence unit 110, acquisition interface 120, and modification interface 130. *Id.* at 67:13–15. Artificial intelligence unit 110 is “configured to receive a first collection of object representations” that include “one or more representations of objects detected by the sensor.” *Id.* at 67:31–35.

Artificial intelligence unit 110 comprises functionality for learning device’s 98 operation. Ex. 1001, 96:42–43. An embodiment of this functionality is shown in Figure 32 of the ’474 patent, depicted below.

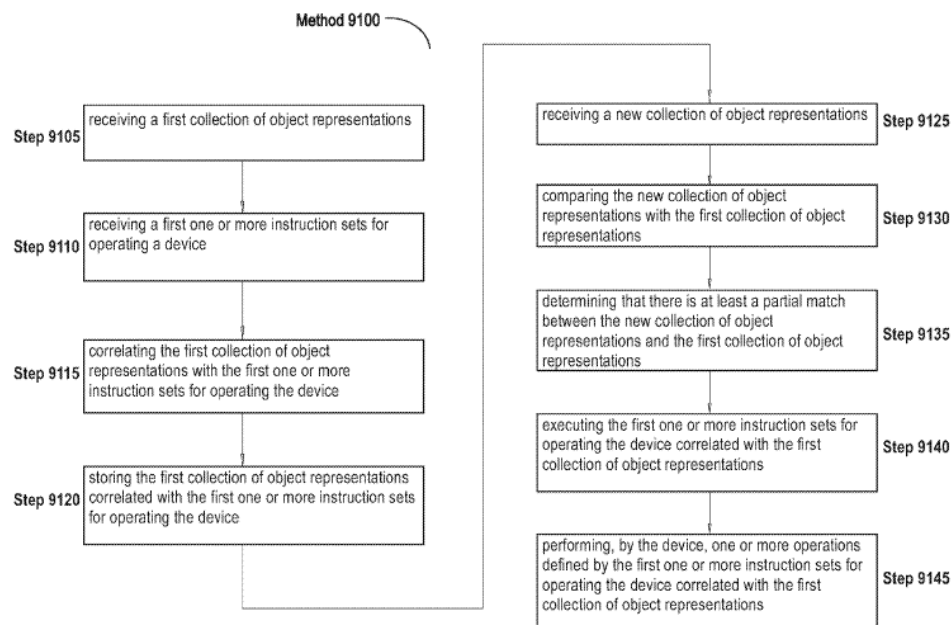


FIG. 32

Figure 32 is an illustration showing an embodiment of method 9100 “for learning and/or using a device’s circumstances for autonomous device operation.” *Id.* at 150:26–28. At step 9105 of Figure 32, “a first collection of object representations is received.” *Id.* at 150:40–41. “An object representation may include an electronic representation of an object (i.e. Object 615, etc.) detected in a device’s surrounding.” *Id.* at 150:45–47. At

step 9110, “a first one or more instruction sets for operating a device are received.” *Id.* at 152:12–13. At step 9115, “the first collection of object representations is correlated with the first one or more instruction sets for operating the device.” *Id.* at 153:34–36. At steps 9125 and 9130, a new collection of object representations is received and “compared with the first collection of object representations.” *Id.* at 154:59–64. At step 9135, “a determination is made that there is at least a partial match between” the two collections. *Id.* at 155:47–49. At step 9140, the “first one or more instruction sets for operating the device correlated with the first collection of object representations are executed.” *Id.* at 157:19–21.

D. Illustrative Claims

Claims 45–47, 51, 56–57, 59–60, and 68–69 of the ’474 patent are at issue in this proceeding. Claim 45 is illustrative of the claimed subject matter at issue and is reproduced below.

[45.pre]¹ A first device comprising:

- [45.1] a knowledgebase that includes one or more inputs for inputting at least a portion of a circumstance representation, wherein the one or more inputs are correlated with one or more instruction sets for operating a second device;
- [45.2] one or more sensors;
- [45.3] one or more processors; and
- [45.4] 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;
- [45.5] generating a circumstance representation, wherein the generated circumstance representation represents a

¹ We use Petitioner’s designations for the elements of claim 45. *See* Pet. v.

circumstance detected at least in part by the one or more sensors;

[45.6] determining one or more instruction sets for operating the second device at least by: inputting at least a portion of the generated circumstance representation into the one or more inputs, and using a correlation between the one or more inputs and the one or more instruction sets for operating the second device; and

[45.7] at least in response to the determining, executing the one or more instruction sets for operating the second device, wherein the first device autonomously performs one or more operations defined by the one or more instruction sets for operating the second device.

Ex. 1001, 176:20–46.

E. Evidence

Petitioner relies on the references summarized in the table below.

Name	Reference	Exhibit
Buibas	US 2014/0089232 A1, published Mar. 27, 2014	1005
Sinyavskiy	US2013/0325768 A1, published Dec. 5, 2013	1006
Versace	US 2017/0024877 A1, published Jan. 26, 2017	1007
Grotmol	US 9,604,359 B1, filed Jan. 27, 2015, issued Mar. 28, 2017	1008
McClure	US 5,219,264, filed Apr. 10, 1990, issued Jun. 15, 1993.	1009

Petitioner also relies on the Declaration of Jason Janet, Ph.D. (Ex. 1003) to support its contentions that the challenged claims are unpatentable.

F. Asserted Grounds

Petitioner asserts that the challenged claims of the '474 patent are unpatentable based on the following grounds summarized in the table below (Pet. 1):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
45–47, 51, 56–57, 59, 68–69	103	Buibas, Sinyavskiy
60	103	Buibas, Sinyavskiy, Versace
45–47, 51, 59, 68– 69	102	Grotmol
60	103	Grotmol, McClure
45–47, 51, 56–57, 59, 68–69	103	Grotmol, Buibas
60	103	Grotmol, Buibas, McClure

III. ANALYSIS

A. Legal Standards

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987). To establish anticipation, “all of the elements and limitations of the claim must be shown in a single prior reference, arranged as in the claim.” *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art;

(3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness, i.e., secondary considerations.² *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art, would have had at least: (1) a bachelor’s degree in electrical engineering, computer engineering, computer science, systems engineering, or equivalent course work with two to three years of work experience in computer vision, image/video processing, and/or machine learning; or (2) a master’s degree in electrical engineering, computer engineering, computer science, systems engineering, or equivalent course work with a focus in computer vision, image/video processing, and/or machine learning.

Pet. 7 (citing Ex. 1003 ¶¶ 44–46). At this stage in the proceeding, Patent Owner adopts Petitioner’s proposal. *See* Prelim. Resp. 4.

Considering the subject matter of the ’474 patent, the background technical field, and the asserted prior art, we agree with Petitioner’s proposed qualifications for the person of ordinary skill in the art, except we decline to adopt “at least,” as that language is vague and open-ended. Otherwise, Petitioner’s proposed definition is consistent with the level of skill reflected in the specification of the ’474 patent and the asserted prior art references. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Accordingly, for purposes of this Decision, and based on the current record, except as noted above, we adopt Petitioner’s assessment of the level of skill for one of ordinary skill in the art.

² Patent Owner does not present objective evidence of nonobviousness at this stage of the proceeding.

C. Claim Construction

We construe the challenged claims by applying the standard used in federal courts, in other words, “the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b),” which is articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2020). Under this standard, the words of a claim generally are given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner states that, at this stage of the proceeding, “no formal constructions are presently necessary,” and that it “maps the prior art in this Petition in a manner consistent with Patent Owner’s allegations of infringement before the district court.” Pet. 8 (citing Ex. 1017; Ex. 1003 ¶¶ 21–25. Patent Owner does not propose a claim construction at this stage of the proceeding. *See* Prelim. Resp.

For purposes of this Decision, we determine that it is not necessary to provide an express construction of any claim terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

D. Ground 1A: Unpatentability of Claims 45–47, 51, 56–57, 59, and 68–69 Over Buibas in View of Sinyavskiy

Petitioner asserts that claims 45–47, 51, 56–57, 59, and 68–69 are unpatentable over Buibas in view of Sinyavskiy. Pet. 8–45. Patent Owner disagrees. Prelim. Resp. 9–21.

We begin with an overview of Buibas and Sinyavskiy. We then turn to the parties’ contentions.

1. Overview of Buibas (Ex. 1005)

Buibas is directed to an “[a]pparatus and methods for learning and training in neural network-based devices.” Ex. 1005, code (57). These devices “each comprise multiple spiking neurons, configured to process sensory input.” *Id.* “In one approach,” Buibas explains, “alternate heterosynaptic plasticity mechanisms are used to enhance learning and field diversity within the devices,” and the “selection of alternate plasticity rules is based on recent post-synaptic activity of neighboring neurons.” *Id.* Buibas further discloses that “[a] data representation of the neural network may be imaged and transferred to another computational environment, effectively copying the brain.” *Id.*

2. Overview of Sinyavskiy (Ex. 1006)

Sinyavskiy is directed to a “stochastic spiking network learning apparatus and methods.” Ex. 1006, code (54). In this system, “[a] framework may be used to enable [an] adaptive spiking neuron signal processing system to flexibly combine different learning rules (supervised, unsupervised, reinforcement learning) with different methods (online or batch learning).” *Id.* at code (57). The generalized learning framework “may employ time-averaged performance function as the learning measure,” thereby “enabling modular architecture where learning tasks are separated

from control tasks, so that changes in one of the modules do not necessitate changes within the other.” *Id.* According to Sinyavskiy, “[s]eparation of learning tasks from the control tasks implementations may allow dynamic reconfiguration of the learning block in response to a task change or learning method change in real time.” *Id.* Sinyavskiy further discloses that the generalized spiking neuron learning apparatus “may be capable of implementing several learning rules concurrently based on the desired control application and without requiring users to explicitly identify the required learning rule composition for that task.” *Id.*

3. Motivation to Combine Buibas and Sinyavskiy

Petitioner argues that “it would have been obvious to partition Buibas’[s] spiking networks according to the specific techniques disclosed in Sinyavskiy” for multiple reasons. Pet. 13 (citing Ex. 1005 ¶¶ 71, 72, 85, 92, 179–203; Ex. 1006 ¶¶ 12, 185, 188, 191, Fig. 6A; Ex. 1003 ¶ 63). First, Petitioner asserts, one of ordinary skill “would have been motivated to partition Buibas’[s] spiking neural network as suggested by Sinyavskiy to parallelize task execution on the robot and improve learning capabilities (e.g., through faster learning, greater computing efficiency, and task-specific learning models) of the Buibas mobile robotic apparatus as described by Sinyavskiy and discussed by Dr. Janet.” *Id.* (citing Ex. 1003 ¶ 64). Second, Petitioner contends, “partitioning Buibas’[s] robotic brain as suggested by Sinyavskiy would have beneficially expanded the range of tasks that the robot could perform by dedicating partitions to specialized tasks.” *Id.* at 13–14 (citing Ex. 1006 ¶¶ 12, 185, 188, Fig. 6A; Ex. 1005 ¶¶ 71, 72, 85, 92, 179–205; Ex. 1003 ¶ 65). Third, Petitioner argues, one of ordinary skill “would have been motivated to partition Buibas’[s] spiking neural network

as suggested by Sinyavskiy to permit unused partitions or unused resources in the partitions to be reassigned for different tasks,” which would allow for a network processing apparatus that has increased processing capability for the same network capacity while also having a lower cost, size and power consumption. *Id.* at 14 (citing Ex. 1006 ¶¶ 190–192, 105, 34, code (57); Ex. 1003 ¶ 66).

Fourth, Petitioner argues that “Buibas briefly mentions that its spiking neural networks can be partitioned but discloses little detail about the partitioning,” which would invite one of ordinary skill to turn to other references, such as Sinyavskiy, for additional detail on how to implement partitioning. Pet. 14–15 (citing Ex. 1005 ¶ 92; Ex. 1003 ¶ 67). Fifth, Petitioner asserts, combining Buibas and Sinyavskiy would merely “involve[] the application of known techniques (e.g., Sinyavskiy’s partitioned network) to a known system (e.g., Buibas’[s] mobile robot and robotic brain) to yield predictable results (e.g., Buibas’[s] robot using a spiking neural network partitioned as taught in Sinyavskiy),” particularly because “the partitioning of the Buibas neural network is reminiscent of Recurrent Fuzzy Neural Networks (RFNNs) that were already commonplace at the end of the 1990’s.” *Id.* at 15 (citing Ex. 1003 ¶ 68). Finally, Petitioner contends, the proposed combination merely involves “use of known techniques (e.g., Sinyavskiy’s partitioned neural network) to improve a similar system (e.g., Buibas’[s] mobile robot and robotic brain).” *Id.* (citing Ex. 1003 ¶ 69).

Petitioner further argues that one of ordinary skill “would have reasonably expected success implementing the combination, especially as Buibas and Sinyavskiy describe highly similar systems involving spiking

neural networks used for training/operating robots.” Pet. 15–16 (citing Ex. 1005 ¶ 92; Ex. 1003 ¶ 70). Indeed, Petitioner contends, “Buibas itself confirms that its spiking neural network can be partitioned, while Sinyavskiy provides the details for doing so.” *Id.* at 16 (citing Ex. 1005 ¶ 92; Ex. 1003 ¶ 70).

In response, Patent Owner argues that Petitioner’s obviousness analysis is flawed because “there is no articulated reasoning regarding what specific element of claim 45 Buibas . . . does not disclose.” Prelim. Resp. 19–20. In other words, according to Patent Owner, Petitioner “failed to perform a proper obviousness analysis because Petitioner has failed to identify anything in the claims that Buibas lacks disclosure of for Ground 1A.” *Id.* at 20.

Based on the present record, we determine that Petitioner has set forth sufficient reasoning to support a motivation to combine Buibas and Sinyavskiy for purposes of institution, as well as sufficient reasoning to support the conclusion that one of ordinary skill would have had a reasonable expectation of success in making the combination. We do not agree with Patent Owner’s argument that Petitioner’s obviousness analysis is flawed because it fails to identify what is lacking in Buibas’s disclosure. To the contrary, Petitioner explains that Buibas “broadly suggests” that its spiking neural networks “can be partitioned into modules for different tasks or behaviors” but “discloses little detail about the partitioning,” and that Sinyavskiy’s more detailed disclosure of partitioning spiking neural networks would fill in these details. *See* Pet. 12–13, 14–15, 24. Petitioner also relies on Sinyavskiy’s more detailed disclosures concerning partitioning the network to satisfy limitations [45.1] and [45.6]. *Id.* at 23–27, 35. Thus,

Petitioner has sufficiently identified what is missing in Buibas (a detailed disclosure of partitioning spiking neural networks) and how that missing information is provided by Sinyavskiy (by disclosure of specific techniques for partitioning spiking networks).

4. *Independent Claim 45*

a) *[45.pre] (preamble) “A first device comprising:”*

Petitioner argues that, to the extent the preamble is limiting, the Buibas-Sinyavskiy combination renders it obvious. Pet. 16 (citing Ex. 1005 ¶¶ 69, 130, 230, Fig. 7; Ex. 1003 ¶ 71). For example, Petitioner asserts, Buibas describes “autonomous” robotic vehicles including “rovers, unmanned air vehicles, underwater vehicles, smart appliances (e.g. ROOMBA), etc.” *Id.* (citing Ex. 1005 ¶ 230). These robots, according to Petitioner, “include ‘brain images’ that are configured through training procedures to autonomously control movements and actions of the robot,” and these brain images can “be shared with other robots.” *Id.* (citing Ex. 1005 ¶¶ 71, 72, 85, 179–203). For example, Petitioner contends, Buibas discloses that “a user may extract the state of a neural network (or other useful training-related information) directly from the device” and “the artificial mind and its traits may be copied, stored, [] later retrieved,” and “shared with other users.” *Id.* (citing Ex. 1005 ¶¶ 70, 71, 182) (alteration in original). Thus, Petitioner argues, “the claimed ‘*first device*’ corresponds to a robot in Buibas that includes at least a portion of a brain image that was trained on another robot (and shared with the first robot). *Id.* at 16–17 (citing Ex. 1003 ¶ 71).

Patent Owner does not present arguments concerning the preamble at this stage of the proceeding. *See* Prelim. Resp. 9–20.

Petitioner's contentions are supported by the cited portions of Buibas. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Buibas discloses the preamble of claim 45 for purposes of institution.³

- b) *[45.1] a knowledgebase that includes one or more inputs for inputting at least a portion of a circumstance representation, wherein the one or more inputs are correlated with one or more instruction sets for operating a second device;*

Petitioner argues that “Buibas teaches that the robotic device (*first device*) can operate autonomously to perform tasks or implement behaviors defined in ‘brain images,’” and that a “brain image” stores information that the robot can use to carry out a particular task or implement a particular behavior. Pet. 17–18 (citing Ex. 1005 ¶¶ 71, 72, 85, 179–203). Petitioner also asserts that “[t]he ‘brain image’ provides at least one *knowledgebase*,” as required by limitation [45.1]. *Id.* More specifically, Petitioner maps “the portion of a brain image (e.g., a partition) dedicated to a particular task or behavior to the claimed ‘*knowledgebase*’” and explains that, as discussed earlier, the Buibas-Sinyavskiy combination allows the brain image to be “partitioned into multiple sections each dedicated to a different task or behavior.” *Id.* at 18 n.2. Petitioner notes that the ’474 patent defines the “knowledgebase 530” broadly by explaining that it “may be or include any data structure or arrangement capable of storing the knowledge of a device’s operation in circumstances including objects with various properties.” *Id.* (citing Ex. 1001, 101:66–102:29).

³ Because Petitioner sufficiently shows that Buibas teaches the preamble, we need not determine whether the preamble is limiting at this stage of the proceeding.

Petitioner argues that Buibas further teaches that “the brain image is loaded onto a ‘brain stem’ (bSTEM) that controls the robotic device,” where “[t]he bSTEM . . . is the hardware component on which the brain image is executed.” Pet. 18 n.3 (citing Ex. 1005 ¶ 202) (alterations in original). According to Petitioner, Buibas also uses the term “robotic brain” to refer to “a trained network or collection of networks.” *Id.* (citing Ex. 1005 ¶ 85). Thus, Petitioner contends, “[a] robotic brain and/or a bSTEM executing a brain image provide related/alternative mappings for the claimed ‘knowledgebase.’” *Id.* (citing Ex. 1003 ¶ 72). Petitioner includes an annotated version of Figure 7 showing the “robotic brain” 712 within a “robotic apparatus” 610, reproduced below.

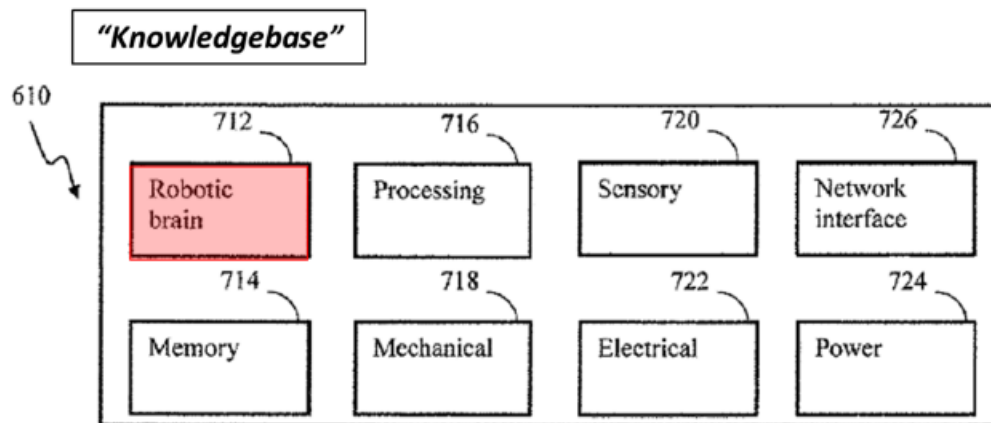


FIG. 7

Petitioner’s annotated version of Buibas’s Figure 7 depicting the claimed “knowledgebase,” including robotic brain 712 (red) within robotic apparatus 610. Pet. 19 (citing Ex. 1005, Fig. 7).

Petitioner argues that Buibas’s “brain image” can be implemented using “any number of different artificial intelligence models and paradigms” including, for example, an “artificial spiking neural network.” Pet. 18–20 (citing Ex. 1005 ¶ 72, Figs. 10, 11B). According to Petitioner, “Buibas teaches that the partition of a ‘brain image’ (*knowledgebase*) for a particular

task or behavior of the robot includes an ‘interface’ or ‘connections’ (*one or more inputs*) that allow the brain image to receive encoded sensory signals and information about the environment, thereby allowing the robot to react appropriately based on the circumstance.” *Id.* at 21 (citing Ex. 1005 ¶¶ 58, 74, 136, 137, 152, Figs. 10, 11B; Ex. 1003 ¶ 73). Petitioner includes annotated versions of Figures 10 and 11B of Buibas, reproduced below, to show these interfaces.

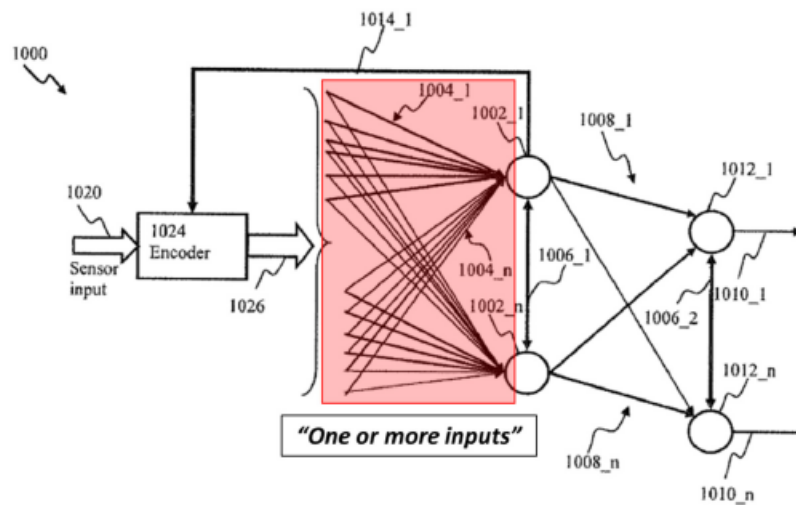


FIG. 10

Petitioner’s annotated version of Figure 10 of Buibas showing the input interface in red. Pet. 22 (citing Ex. 1005 ¶ 136, Fig. 10).

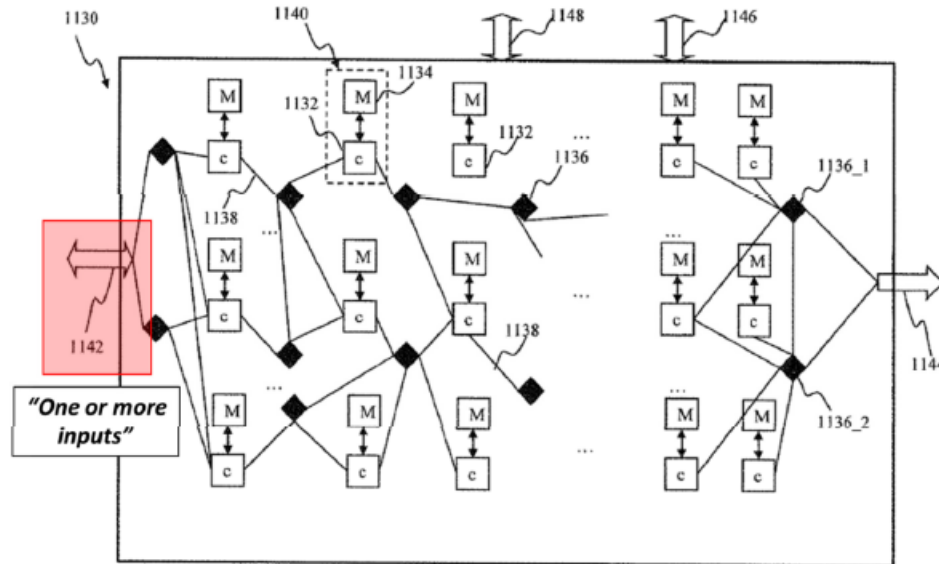


FIG. 11B

Petitioner’s annotated version of Figure 11B of Buibas showing the input interface in red. Pet. 22 (citing Ex. 1005 ¶ 152, Fig. 11B; Ex. 1003 ¶ 73).

Additionally, Petitioner argues that Buibas’s “brain image” for a particular task or behavior “is configured, when executed, to issue ‘commands’ (*one or more instruction sets*) to motors and other components of the robot that cause the robot to carry out a task/behavior defined by the brain image.” Pet. 23 (citing Ex. 1005 ¶¶ 130, 131, 153, 157–159, 161). For example, Petitioner contends, Buibas shows a “neuromorphic apparatus” with an output “interface 1144” that “provide[s] output (e.g., an indication of [a] recognized object or a feature, or a motor command, e.g., to zoom/pan the image array),” which constitutes “one or more instruction sets,” (*id.* (first alteration in original)), as shown in the annotated version of Buibas’s Figure 11B, reproduced below.

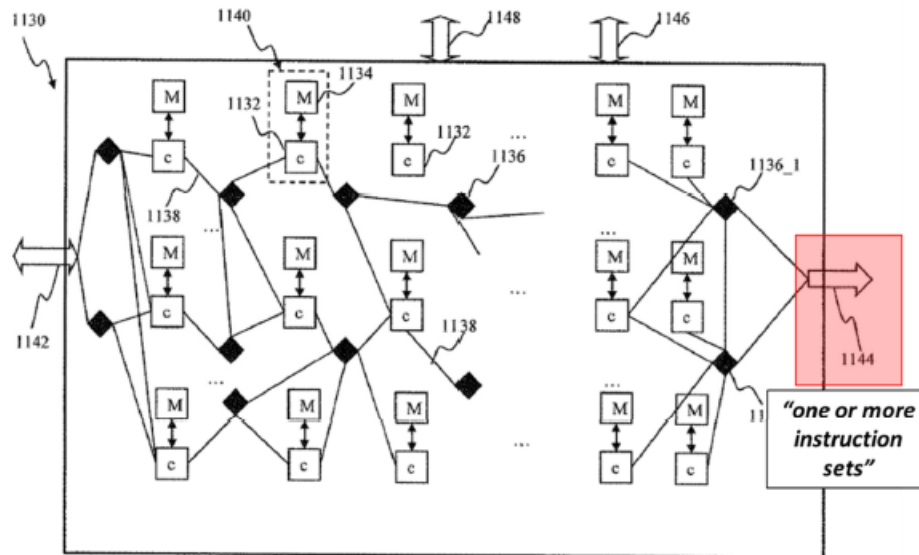


FIG. 11B

Petitioner's annotated version of Figure 11B of Buibas showing output interface 1144 in red. Pet. 23 (citing Ex. 1005 ¶¶ 152, 153, Fig. 11B; Ex. 1003 ¶ 74).

Petitioner also argues that Buibas teaches implementing its “robotic brain” as “a partitioned network,” and that Sinyavskiy provides more details about such a “partitioned network configuration.” Pet. 24 (citing Ex. 1005 ¶¶ 92, 96; Ex. 1006 ¶¶ 12, 185, 188, Fig. 6A). For example, Petitioner asserts, “Sinyavskiy discloses how different portions of a spiking neural network can be partitioned into sections dedicated to different tasks,” as shown in Petitioner’s annotated version of Sinyavskiy’s Figure 6A, reproduced below.

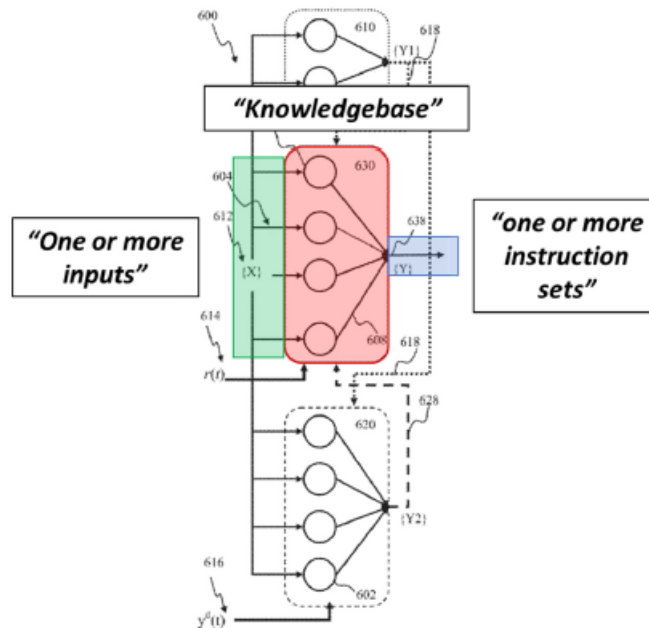


FIG. 6A

Petitioner’s annotated version of Sinyavskiy’s Figure 6 showing the inputs in green, the “knowledgebase” in red, and the “one or more instruction sets” in blue. Pet. 24 (citing Ex. 1006 ¶¶ 185–192, Figs. 6A–6B; Ex. 1003 ¶ 75).

Petitioner further contends that Buibas “teaches that brain images defining different tasks or behaviors can be combined (e.g., ‘merged’) to create an ‘offspring’ brain image with enhanced capabilities, where the original (‘parent’) brain images persist as partial brain images (e.g., partitions) in the combined (‘offspring’) image.” *Id.* at 25 (citing Ex. 1005 ¶¶ 94–104, 188, 189, 220, 225, Figs. 4–5; Ex. 1003 ¶ 76).

“In the Buibas-Sinyavskiy combination,” Petitioner argues, “a partition of a brain image for a particular task or behavior provides the claimed ‘*knowledgebase*,’” and “[t]he input interface or connections to an individual partition (*one or more inputs*) are correlated with the control commands (*one or more instruction sets*) produced by that partition.” Pet. 25–26 (citing Ex. 1005 ¶¶ 92–104, 188, 189, 220, 225, Figs. 4–5; Ex. 1006 ¶¶ 12, 185, 188, Fig. 6A). For example, Petitioner asserts, in

Sinyavskiy's Figure 6A reproduced above, "the inputs (*one or more inputs*) of partition 630 (*knowledgebase*) are correlated with the outputted motor commands '{Y}' (*one or more instruction sets*)," the "inputs of partition 610 are correlated with output '{Y1}'[,]" and the inputs of partition 620 are correlated with output '{Y2}' (*the one or more inputs are correlated with one or more instruction sets*)." *Id.* at 26 (citing Ex. 1006 ¶¶ 185–188, Fig. 6A). The correlation, according to Petitioner, "relates the inputs of an individual partition to the outputs produced by that partition," and the inputs of a given partition "are not correlated to the outputs of other partitions." *Id.* (citing Ex. 1003 ¶ 77).

Additionally, Petitioner argues that Buibas teaches that "brain images can be shared and loaded on robots other than the robot on which the brain image was originally trained." Pet. 27 (citing Ex. 1005 ¶¶ 70, 71, 85, 184, 188, 201, Fig. 14). "When a first robot (*first device*) 'loads' a brain image (containing a *knowledgebase*)," according to Petitioner, "either in full or as a partial image combined with other images, which was trained on a second robot (*second device*), the commands produced by that brain image constitute *one or more instruction sets for operating a second device*, as claimed." *Id.* (citing Ex. 1003 ¶ 78). In this context, Petitioner contends, Buibas's brain image "provides instruction that were learned on a second device" but are "applied to operate a first device." *Id.* at 27–28 (citing Ex. 1003 ¶ 78). Petitioner points to its annotated version of Buibas's Figure 14, reproduced below, to illustrate "an example 'cloud-based training system' that can download stored brain images to a robot." *Id.* at 28.

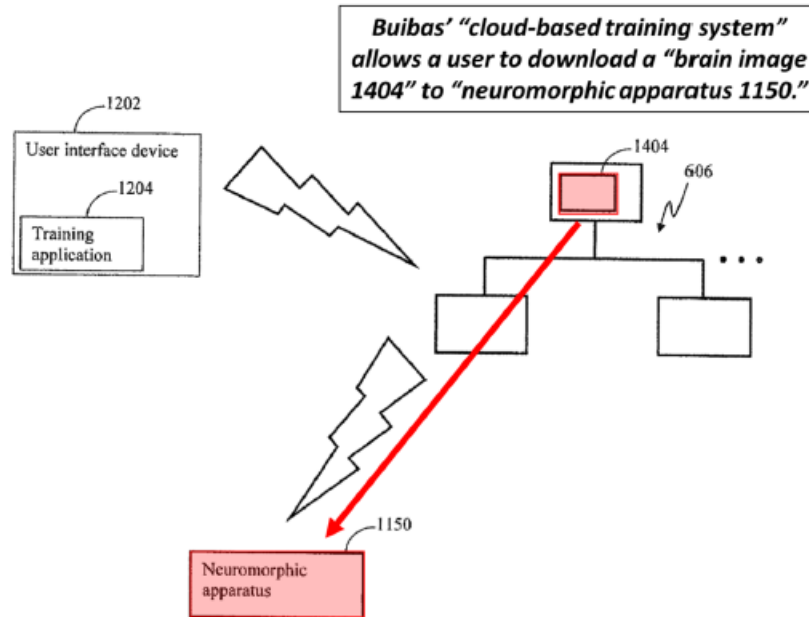


FIG. 14

Petitioner's annotated version of Buibas's Figure 14 showing a "cloud based training system" that allows a user to download a "brain image 1404" (red) to "neuromorphic apparatus 1150" (red). Pet. 28 (citing Ex. 1005, Fig. 14).

Petitioner argues that these examples from Buibas "are similar to examples given in the '474 Patent, for example, in which 'a Device 98 . . . having access to a combined Knowledgebase 530 can use the collective knowledge learned from multiple Devices 98 for the Device's 98 autonomous operation.'" Pet. 28 (citing Ex. 1001, 103:35–39) (alteration in original). Petitioner also asserts that this mapping is "consistent with the limitations in dependent claim 51" of the '474 patent, which recite that "at least a portion of the one or more instruction sets for operating the second device is learned in a learning process that includes operating the second device at least partially by a user." *Id.* at 28–29 (citing Ex. 1001, claims 51, 52; Ex. 1003 ¶ 79). "As another example," according to Petitioner, "Buibas discloses that 'multiple mechanical, sensory, or electrical units may be controlled [by] a single robotic brain via network/radio connectivity.'" *Id.* at 29 (citing Ex. 1005 ¶ 130). Thus, Petitioner contends, Buibas "discloses or

plainly suggests that the motor commands issued by a robotic brain can be used to operate not only a local robot (*first device*) on which the brain is installed, but can also be applied to operate a remote robot (*second device*) which receives the operating instructions from the first robot over a wireless connection.” *Id.* Likewise, according to Petitioner, “[t]he control outputs (e.g., motor commands) provided to remotely operate the second device in this example” constitute “one or more instruction sets for operating a second device” as claimed. *Id.*

Patent Owner responds that Buibas and Sinyavskiy fail to disclose or suggest “one or more inputs for inputting at least a portion of a circumstance representation,” as required by claim 45. Prelim. Resp. 10; Prelim Sur-reply 3–5. Patent Owner acknowledges that Petitioner maps Buibas’s “encoded sensory signals and information about the environment,” as well as Buibas’s “data,” to the claimed “at least a portion of a circumstance representation,” but argues that Petitioner “has not explained how these signals, information, and data are circumstance representations.” Prelim. Resp. 10 (emphasis omitted). Patent Owner also asserts that Dr. Janet’s statement that the “encoded sensory signals and information” are received by Buibas’s brain images is wrong because “a brain image in Buibas is a collection of weights that inherently and by Buibas’s explicit disclosure do not receive any input.” *Id.* at 10–11 (citing Ex. 1005 ¶¶ 179, 183) (emphasis omitted). Additionally, Patent Owner acknowledges that “Buibas does disclose an ‘input interface configured to receive an input sensory signal,’ but argues that “Petitioner has not explained, and Buibas does not disclose, how that input sensory signal is the claimed circumstance representation.” *Id.* at 11 (citing Ex. 1004 ¶ 73) (emphasis omitted). According to Patent Owner, Buibas’s brain image

“is a collection of weights that inherently and by Buibas’s explicit definition does not include any interface or connections.” *Id.* at 12 (citing Pet. 21) (emphasis omitted).

Patent Owner also argues that “Buibas and Sinyavskiy do not disclose or suggest the claimed first device comprising a knowledgebase including inputs correlated with instruction sets for operating a second device.”

Prelim. Resp. 13. Patent Owner asserts that Petitioner points to Buibas’s “brain image,” but this “brain image” “is a collection of weights” that “does not include any inputs, any instruction sets, or anything other than weights.” *Id.* (citing Ex. 1005 ¶¶ 89, 90, 123, 179, 183) (emphasis omitted). Patent Owner acknowledges that “Buibas discloses loading this collection of weights (brain image) from one robot to another robot,” but argues that Buibas “never discloses instruction sets for operating another robot *since the brain image does not include any instruction sets.*” *Id.* As a result, Patent Owner contends, Buibas fails to disclose or suggest the claimed first device comprising a knowledgebase including inputs correlated with instruction sets for operating a second device. *Id.*

Petitioner responds that Patent Owner fails to address the full extent of the Petition’s mappings of Buibas to the claimed “knowledgebase” by narrowing its focus to Buibas’s “brain image” and “weights.” Prelim. Resp. 5 (citing Prelim. Resp. 13–16; Pet. 18–20). To the contrary, Petitioner argues, “Buibas’[s] ‘robotic brain’ and ‘brain stem (bSTEM)’ are also within Petitioner’s mapping of the claimed ‘knowledgebase,’” and “[t]he brain and brain stem are clearly not limited to a mere collection of ‘weights,’ but further include entire neural networks and hardware components.” *Id.* (citing Pet. 17–20; Ex. 1005 ¶¶ 79, 85, 202). Pointing to its annotated

versions of Buibas's Figures 10 and 11B (reproduced above), Petitioner also asserts that these figures "further confirm that Petitioner's mapping was not limited to 'weights,' but rather encompassed the inputs, neurons, and network edges or interconnections that are also part of the structure of Buibas's robotic brain." *Id.*

Based on the present record, we preliminarily determine that Petitioner has sufficiently shown that the combination of Buibas and Sinyavskiy teaches this limitation for purposes of institution. At this early stage of the proceedings, we do not agree with Patent Owner's argument that Petitioner has not sufficiently explained how the "encoded sensory signals and information about the environment" disclosed in Buibas are the claimed "at least a portion of a circumstance representation." *See* Prelim. Resp. 10. The Petition states that the "one or more inputs" of claim 45 "encompass interfaces to the knowledgebase configured to receive data (e.g., 'at least a portion of a circumstance representation') from which operating instructions can be determined." Pet. 21 n.4 (emphasis omitted). In connection with limitation 45.4, the Petition further explains that Buibas's sensory input 120 "represent a circumstance detected at least in part by the one or more sensors," and can include "circumstances of the robot, including for example, 'gestures, voice, posture, face, etc.,' types of objects around the robot and events occurring around the robot." *Id.* at 32–33 (citing Ex. 1005 ¶¶ 117, 137, 232) (emphasis omitted). The Petition further asserts that this sensory input "can be encoded to generate an 'encoded signal' (*a circumstance representation*)."*Id.* at 33 (citing Ex. 1005 ¶ 137). Specifically, Petitioner points to paragraph 137 of Buibas, which explains that "[t]he apparatus 1000 may comprise an encoder 1024 configured to

transform the input signal into an encoded signal,” and that this encoded signal may “comprise[] a plurality of pulses . . . configured to model neuron behavior.” *Id.* (third alteration in original). At this stage of the proceeding, Petitioner’s mapping of this “encoded signal” to the claimed “circumstance representation” is sufficient for purposes of institution. We note that Patent Owner has not provided any explanation of why this encoded signal would not be a “circumstance representation” as claimed.

Based on the present record, we also do not agree with Patent Owner’s argument that Buibas’s “brain image” cannot be the claimed “knowledgebase that includes one or more inputs correlated with one or more instruction sets for operating a second device” because this “brain image” is merely a “collection of weights” that “does not include any inputs, any instruction sets, or anything other than weights.” *See* Prelim. Resp. 13 (citing Pet. 17–23; Ex. 1005 ¶¶ 89, 90, 123, 179, 183) (emphasis omitted). To the contrary, we agree with Petitioner that its mapping of Buibas to the claimed “knowledgebase” includes more than simply the “collection of weights” in the brain image, but also includes the input interface to the knowledgebase (as shown in red in Petitioner’s annotated versions of Buibas’s Figures 10 and 11B reproduced above), and commands correlated to the inputs received (shown in red as reference 1144 in Figure 11B). *See* Pet. 22–23. Petitioner further points to the “robotic brain” and/or “bSTEM” of Buibas, which executes a brain image, and includes more than simply a “collection of weights.” *Id.* at 18 n.3, 19; Prelim. Reply 3–5. Petitioner also identifies inputs and outputs as part of the knowledgebase in its annotated version of Sinyavskiy’s Figure 6A, reproduced above. Pet. 24. We find that, for purposes of institution, these arguments by Petitioner are sufficient

to show a knowledgebase having inputs correlated with instruction sets for operating a second device, as claimed.

Consequently, we find that Petitioner has sufficiently shown at this early stage of the proceeding that this limitation would have been obvious over the Buibas-Sinyavskiy combination.

*c) [45.2] one or more sensors;
[45.3] one or more processors; and*

Petitioner argues that Buibas discloses that its robotic device includes one or more “sensory devices” and “sensory information,” which meet the claim language requiring “one or more sensors.” Pet. 29 (citing Ex. 1005 ¶¶ 132, 136). According to Petitioner, Buibas discloses examples of sensory devices, including “video, audio, haptic, capacitive, radio, vibrational, ultrasonic, infrared, and temperature sensors[,] radar, lidar and/or sonar.” *Id.* at 30 (citing Ex. 1005 ¶¶ 132, 136). Petitioner also contends that Buibas’s Figure 7 shows an example robotic apparatus that includes “sensory devices 720.” *Id.* (citing Ex. 1005 ¶ 132, Fig. 7).

Petitioner further argues that Buibas’s robotic device includes “processing capacity 716” and “processing devices,” which meet the claim language requiring “one or more processors.” Pet. 30 (citing Ex. 1005 ¶¶ 130, 149, Fig. 7). Petitioner asserts that Buibas discloses examples of processing devices, including “a single core/multicore CPU, DSP, FPGA, GPU, ASIC, combinations thereof, and/or other processors.” *Id.* (citing Ex. 1005 ¶ 149).

Patent Owner does not present arguments directed to these limitations at this stage of the proceeding. *See* Prelim. Resp. 9–20.

Petitioner's contentions are supported by the cited portions of Buibas. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Buibas discloses these claim elements for purposes of institution.

- d) [45.4] 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;*

Petitioner argues that Buibas discloses that its robotic device includes “memory” and/or “a nonvolatile storage device 1106, comprising, inter alia, computer readable instructions.” Pet. 31 (citing Ex. 1005 ¶¶ 130, 146, 154, Fig. 7). Petitioner also asserts that Buibas discloses that this media is used to “implement various aspects of spiking neuronal network operation (e.g., sensory input encoding, connection plasticity, operation model of neurons, etc.).” *Id.* (citing Ex. 1005 ¶ 146).

Patent Owner does not present arguments directed to this limitation at this stage of the proceeding. *See* Prelim. Resp. 9–20.

Petitioner's contentions are supported by the cited portions of Buibas. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Buibas discloses this claim element for purposes of institution.

- e) [45.5] generating a circumstance representation, wherein the generated circumstance representation represents a circumstance detected at least in part by the one or more sensors;*

Petitioner argues that Buibas describes how the robot's sensors can detect information representative of a circumstance. Pet. 32 (citing Ex. 1005 ¶¶ 88, 117, 137, 188, 232, Fig. 10). Specifically, Petitioner points to

Buibas’s disclosure that sensory devices 720 can include “video, audio, haptic, capacitive, radio, vibrational, ultrasonic, infrared, and temperature sensors[,] radar, lidar and/or sonar,” each of which detects information about the environment or other circumstances of the robot. *Id.* According to Petitioner, “Buibas discloses that information detected by the robot’s sensors are representative of circumstances of the robot, including for example, “gestures, voice, posture, face, etc.” *Id.* (citing Ex. 1005 ¶¶ 117, 232). Petitioner also contends that Buibas teaches “that sensory inputs (e.g., sensory input 1020) (***represent[ing] a circumstance detected at least in part by the one or more sensors***) can be encoded to generate an ‘encoded signal’ (***a circumstance representation***) representative of a circumstance of the robot.” *Id.* at 33 (citing Ex. 1005 ¶ 137) (alteration in original). Petitioner further argues that Buibas’s Figure 10 illustrates an example “input interface configured to receive an input sensory signal,” and that Sinyavskiy also discloses a partition 610 that “adapt[s] raw sensory input of a robot apparatus to [the] internal format of the network.” *Id.* (citing Ex. 1005 ¶ 136; Ex. 1006 ¶ 188; Ex. 1003 ¶¶ 85–86) (first alteration in original).

Patent Owner does not present arguments directed to this limitation at this stage of the proceeding. *See* Prelim. Resp. 9–20.

Petitioner’s contentions are supported by the cited portions of Buibas. After consideration of the contentions and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently that Buibas discloses this claim element for purposes of institution.

- f) [45.6] *determining the one or more instruction sets for operating the second device at least by: inputting at least a portion of the generated circumstance representation into the one or more inputs, and using a correlation between the*

one or more inputs and the one or more instruction sets for operating the second device; and

Petitioner argues that the Buibas-Sinyavskiy combination renders this limitation obvious. Pet. 34. Petitioner asserts that, for example, “Buibas discloses that, in operation, at least a portion of the robot’s ‘encoded [sensory] signal’ (*at least a portion of the generated circumstance representation*) is inputted into the ‘interface’ or input ‘connections’ (*one or more inputs*) of the robot’s brain.” *Id.* (citing Ex. 1005 ¶¶ 130, 131, 153, 159; Ex. 1006 ¶ 110, Fig. 6A). “In the Buibas-Sinyavskiy combination,” according to Petitioner, “the encoded sensory signal is predictably provided to the input interface/connections (*one or more inputs*) of an individual partition of the brain (*knowledgebase*) configured to produce control outputs (e.g., motor commands) (*one or more instruction sets*) for a particular task or behavior of the robot.” *Id.* Petitioner provides an annotated version of Sinyavskiy’s Figure 6A, reproduced below, to illustrate an example of a “partitioned neural network” that generates an “output {Y}” from an “input {X}.” *Id.*

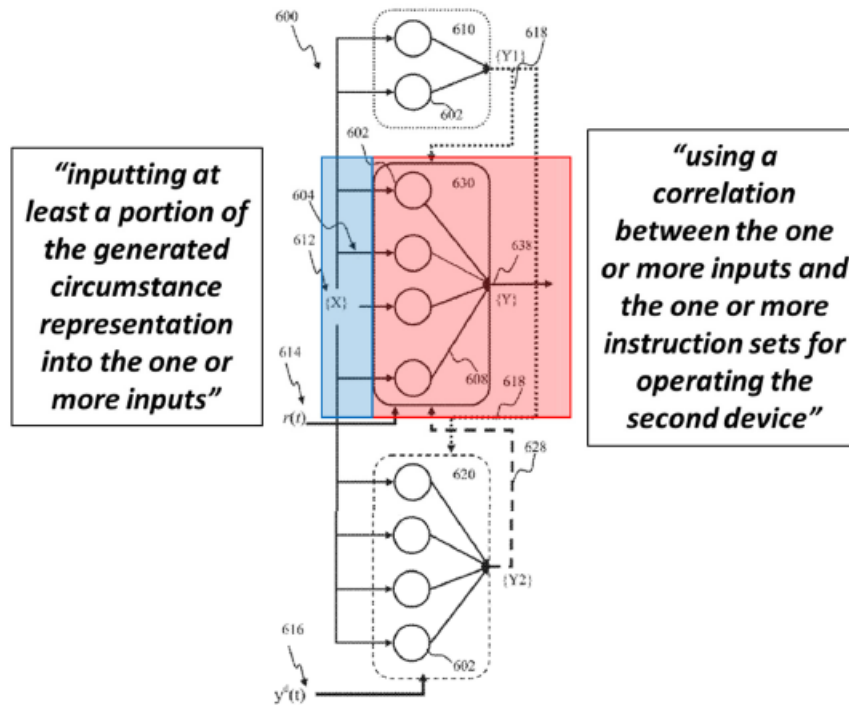


FIG. 6A

Petitioner’s annotated version of Sinyavskiy’s Figure 6A showing the “inputting of at least a portion of the generated circumstance representation into the one or more inputs” in blue and “using a correlation between the one or more inputs and the one or more instruction sets for operating the second device” in red. Pet. 35 (citing Ex. 1006, Fig. 6A).

Petitioner argues that, as discussed above for limitation [45.1], “the input interface/connections (*one or more inputs*) of a partition of a brain image for a particular task or behavior are correlated with the commands produced by that brain image (*using a correlation between the one or more inputs and the one or more instruction sets for operating the second device*).” Pet. 35–36 (citing Ex. 1003 ¶ 88). “When the robot (*first device*) operates autonomously to perform a particular task or behavior implemented by the partition,” Petitioner contends, “it uses this correlation to determine one or more commands (*one or more instruction sets*) appropriate to carry out that particular task or behavior in view of the inputted encoded sensory

signal (*at least a portion of the generated circumstance representation*).”
Id.

Petitioner further argues that, as discussed with respect to limitation [45.1], “the commands (*one or more instruction sets*) produced by a brain on a first robot (*first device*) can be learned in a training procedure performed on a second robot (*second device*) such that the commands determined based on the input encoded sensory signal (*at least a portion of the generated circumstance representation*) are commands for operating the second robot (*one or more instruction sets for operating the second device*).” Pet. 36. “As another example,” Petitioner asserts, “the brain image on the first robot can determine motor commands to operate both the first robot and a remote, second robot.” *Id.* (citing Ex. 1003 ¶¶ 89–90).

Patent Owner responds by pointing to its argument for limitation [45.1] that Buibas only “discloses sharing weights or brain images among robots” which “has no relevance to the claimed instruction sets for operating the second device,” and “nothing in Sinyavskiy even contemplates the claimed instruction sets for operating the second device.” Prelim. Resp. 16–17. Because “the references do not disclose or suggest the claimed instruction sets for operating a second device,” Patent Owner asserts, they necessarily cannot “disclose or suggest determining the instruction sets for operating the second device by using a correlation between the inputs and the instruction sets for operating the second device.” *Id.* at 17. Patent Owner also takes issue with Petitioner’s assertion that the combination provides an encoded sensory signal to the input interface/connections of a partition of the brain configured to produce outputs for a particular task or behavior, arguing that this assertion is “conclusory” and “unsupported by

either reference,” and “does not say anything about the claimed instruction sets for operating a second device.” *Id.* (citing Pet. 34) (emphasis added).

Based on the present record, Petitioner has sufficiently shown that the combination of Buibas and Sinyavskiy teaches this limitation. As discussed above with respect to limitation [45.1], we do not agree with Patent Owner’s argument that that Buibas only “discloses sharing weights or brain images among robots that has no relevance to the claimed instruction sets for operating the second device.” *See* Prelim. Resp. 16. To the contrary, Petitioner relies on more than simply “weights” in the knowledgebase, such as the robotic brain and/or bSTEM that includes an input interface and outputs a series of commands, which correspond to the claimed “one or more instruction sets.” *See* § III.D.3(b), *supra*. As further discussed above, Buibas also discloses that a first device may load a brain image that was trained on a second robot. *Id.* This brain image would correlate particular inputs used in the training of the second robot with commands (instruction sets) corresponding to those inputs and thus, when this brain image was loaded into the first device, it would correlate similar inputs to the first device with these commands or instruction sets. *Id.*

We also do not find persuasive Patent Owner’s contention that “noting in Sinyavskiy even contemplates the claimed instruction sets for operating the second device,” because Petitioner relies on Buibas, not Sinyavskiy, for the loading of the brain image of the second device into the first device. *See* Prelim. Resp. 16–17. Finally, we disagree with Patent Owner’s contention that Petitioner’s argument that “the inputs (one or more inputs) of partition 630 (knowledgebase) are correlated with the output motor control commands” in Sinyavskiy is “conclusory” and “unsupported by

Sinyavskiy.” *See id.* at 15. To the contrary, Petitioner has set forth sufficiently detailed contentions on this point for purposes of institution, and points to portions of Sinyavskiy to support its argument. *See* Pet. 26–27.

Consequently, we find that Petitioner has sufficiently shown at this early stage of the proceeding that this limitation would have been obvious over the Buibas-Sinyavskiy combination.

g) Conclusion as to Claim 45

For the reasons discussed above, and based on the present record, Petitioner has demonstrated a reasonable likelihood that claim 45 would have been obvious over the combination of Buibas and Sinyavskiy.

5. Dependent Claims 46, 47, 51, 56, 57, 59, 68, and 69

Petitioner presents arguments that dependent claims 46, 47, 51, 56, 57, 59, 68, and 69 would have been obvious over the combination of Buibas and Sinyavskiy. Pet. 68–72. Patent Owner does not present arguments as to these claims at this stage of the proceeding. *See* Prelim. Resp. 20–21. On this record, we determine that Petitioner has demonstrated a reasonable likelihood that these dependent claims would have been obvious over the Buibas-Sinyavskiy combination.

E. Remaining Grounds

As discussed above, Petitioner has demonstrated a reasonable likelihood that claims 45–47, 51, 56, 57, 59, 68, and 69 would have been obvious over the combination of Buibas and Sinyavskiy. We have authority to institute an *inter partes* review where “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C.

§ 314 (2018). We therefore institute trial on all challenged claims and grounds raised in the Petition. *See PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (indicating that a decision whether to institute an *inter partes* review “require[s] a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

To provide guidance to the parties, we provide below our preliminary thoughts on Patent Owner’s arguments concerning the remaining grounds.

1. Ground 2A: Anticipation of Claims 45–47, 51, 59, 68–69 by Grotmol (Ex. 1008)

The parties’ dispute concerning Ground 2A centers on whether Grotmol discloses a first device comprising “a knowledgebase that includes one or more inputs for inputting at least a portion of a circumstance representation, wherein the one or more inputs are correlated with one or more instruction sets for operating a second device.” Pet. 56–60, 65–68; Prelim. Resp. 22–26.

Petitioner argues that Grotmol discloses an “adaptive controller” (knowledgebase) that stores “classifiers” or “modules” for controlling operations of a robot, including an input interface that correlates the input with motor commands (instruction sets) produced by the adaptive controller. Pet. 56. Petitioner also asserts that Grotmol discloses that training data can be shared between robots. *Id.* at 59. In particular, according to Petitioner, Grotmol discloses that the “trained configuration” of an adaptive controller “may be loaded to one or more other robots in order to provide learned behaviors,” which satisfies the claim language requiring “one or more instruction sets for operating a second device.” *Id.* at 59–60. Petitioner argues that, when the trained configuration of one of Grotmol’s adaptive controllers is learned on a second robot and loaded onto a first robot, the

control outputs used and produced in that controller applied to the first robot are also instruction sets for operating the second robot. *Id.*

Patent Owner argues that “Grotmol discloses nothing about the adaptive controller on a robot having any instruction sets for operating another robot,” and that Grotmol does not disclose loading the adaptive controller from one robot to another to enable the first device to comprise instruction sets for operating a second device. Prelim. Resp. 23 (emphasis omitted). Patent Owner asserts that Grotmol’s disclosure that a trained configuration from one robot may be loaded to one or more other robots does not help Petitioner because “the saved/trained configuration is a distinct entity from the adaptive controller,” and Petitioner has mapped Grotmol’s adaptive controller (rather than the trained configuration) to the claimed knowledgebase. *Id.*

Petitioner responds that “Grotmol makes clear that ‘trained configurations’ are provided in the ‘trained controllers’ (‘adaptive controllers,’ as said elsewhere in Grotmol), and that these trained configurations are shared between devices.” Prelim. Reply 3.

Based on the present record, we preliminarily determine that Petitioner has made a sufficient showing at this stage of the proceeding that Grotmol’s “trained configuration” that is loaded from one robot to another is part of a “trained controller,” which corresponds to Grotmol’s “adaptive controllers.” For example, Grotmol explains that “[t]he 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. 1008, 33:24–27. We also determine that Petitioner has sufficiently shown at this stage that the “trained configuration” loaded from one robot to

another would include inputs correlated with instruction sets. The parties may further develop their arguments as to this issue during the trial.

2. *Ground 2C: Unpatentability of Claims 45–47, 51, 56, 57, 59, 68, and 69 Over Grotmol in View of Buibas*

Patent Owner’s arguments in this ground are similar to those made in Grounds 1A and 2A. Specifically, Patent Owner argues that Grotmol never discloses that the “adapted controller” is loaded from one robot to another to enable the first device to comprise a knowledgebase that includes instruction sets for operating a second device, similar to its argument for Ground 2A. Prelim. Resp. 27. Patent Owner also argues that Buibas only discloses loading a collection of weights from one robot to another, which does not include any instruction sets, similar to its argument for Ground 1A. *Id.* at 27–28. For the reasons discussed above with respect to Grounds 1A and 2A, we determine that Petitioner has made a sufficient showing as to these issues at this stage of the proceeding.

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated that there is a reasonable likelihood that it would prevail in proving the unpatentability of at least one of the challenged claims of the ’474 patent. We thus institute an *inter partes* review of all of the challenged claims of the ’474 patent on all grounds asserted in the Petition. *See* 37 C.F.R. § 42.108(a).

Any findings or conclusions in this Decision are made only for the purposes of institution and are not dispositive of any issue. We have not made a final determination with respect to the patentability of any challenged claim. Our final determination will be based on the record as

fully developed during trial, including any evidence or argument timely presented by the parties under our Rules.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 45–47, 51, 56, 57, 59, 60, 68, and 69 of the '474 patent is hereby instituted on all grounds of unpatentability set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial commencing on the entry date of this decision.

IPR2024-00745
Patent 11,663,474 B1

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