

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner

v.

AUTONOMOUS DEVICES, INC.,
Patent Owner

Case IPR2023-01055
Patent 11,238,344

**PETITIONER'S SUR-REPLY TO PATENT OWNER'S REPLY TO
OPPOSITION TO MOTION TO AMEND**

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EXHIBIT LIST

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

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

The Board should find the Substitute Claims presented in Patent Owner's Motion to Amend ("MTA," Paper 28) unpatentable under 35 U.S.C. §§ 101 and 103 for each of the reasons described in the Opposition (Paper 31) and this Sur-Reply.

II. The Substitute Claims are Obvious Based on the Grotmol-Hickman Combination ("GHC") and the Grotmol-Tolstedt Combination ("GTC")

A. GHC renders obvious elements [21.10]-[21.11] and [21.13]-[21.14]

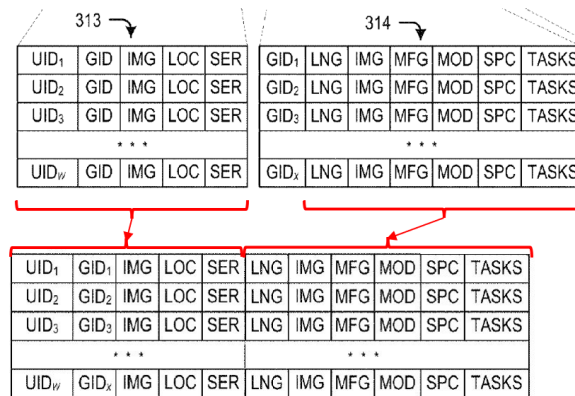
The Preliminary Guidance ("PG") determined that the Opposition had not sufficiently shown that the asserted prior art discloses or renders obvious (1) "processing one or more digital pictures to detect . . . a size of a [first]/[second] object" as recited in elements [21.10] and [21.13] and (2) "generating the [first]/[second] data structure that includes . . . a computer model indicating the detected size of the [first]/[second] object" as recited in elements [21.11] and [21.14]. Paper 32, 7. PO's Reply adopts the findings of the PG and further argues that the prior art does not disclose detected object locations or data structures that include a coordinate indicating the detected location.

For the reasons explained below, Petitioner respectfully submits that the conclusions in the PG, and PO's Reply arguments, are incorrect.

1. GHC renders obvious object sizes and locations "detected" by processing digital pictures (elements [21.10], [21.13])

Hickman's cloud system 102 analyzes images, learns about objects in the images, and stores the learned information in one or more knowledge bases.

Opposition, 20-21, TESLA1005, FIG. 3, 6:60-67, 10:41-56, 11:9-24:64, 13:25-20:20, FIG. 3; TESLA1010, ¶¶88. Hickman provides significant flexibility in the design and arrangement of data in its knowledge bases, and Hickman describes how the disparate knowledge bases 307-309 shown in FIG. 3 can even be combined into a single knowledge base in some embodiments. TESLA1005, 10:57-11:7. Thus, whether a particular data field is part of knowledge base 307, 308, or 309 is not relevant, because separate knowledge bases can be combined into one, as shown in the example illustration below. Opposition, 14; TESLA1010, ¶¶74-75.



Derived from TESLA1005 (Hickman), FIG. 5.

In the GHC, a row in Hickman's knowledge base(s) that store information for a first object depicted in Grotmol's image 2000 (FIG. 20A) provides the claimed "first data structure" and a row in Hickman's knowledge base(s) that store information for a second object in Grotmol's image 2000 provides the claimed "second data structure." TESLA1010, ¶¶88-94; Opposition, 19-23.

The fields in Hickman's knowledge bases 307-309 having corresponding data structures 313-315 include location data (LOC), model data (MOD), specification data (SPC), and task data (TASK) for objects. TESLA1005, FIG. 3 (reproduced below), 14:61-20:20. "The specification data (SPC) may include physical attributes associated with the particular 'type' of object corresponding to the general object identifier (GID)" including "e.g., physical dimensions (height, width, depth, shape, volume, area, etc.)." TESLA1005, 18:4-14, 2:65-3:21, 12:5-18, 14:1-30.

GHC further discloses and renders obvious that the object size ("physical dimensions") provided by the SPC field and the object coordinates provided by the LOC field can be "detected" by processing digital pictures. For example, Hickman explains that data in its knowledge bases can be entered and updated automatically by authorized robots. TESLA1005, 3:8-11, 3:16-26, 3:46-55, 5:7-12, 10:53-56, 11:20-30. Hickman's cloud system receives images from robots or information about objects detected in images and uses that information to update its knowledge bases. TESLA1005, 25:24-46, FIG. 4. Further, in the combination, Grotmol's robots share images and their features and training sets with Hickman's cloud system. Opposition, 13-16. Grotmol expressly teaches that the image features that would be sent to Hickman's cloud include locations and sizes of objects detected in images acquired by the robot. TESLA1004, 10:31-32 ("object size, location"), 39:13-17, 28:19-25, 4:9-11, 10:26-32, 31:23-27, 48:65-67, FIG. 10A (depicting

image feature extractors). Detecting the size and location of objects from digital pictures is thus expressly disclosed in Grotmol and would have been straightforward and obvious to implement in the GHC. Hickman similarly confirms that its robots too can detect the information that it sends to the cloud system, including object location and size information for updating the knowledgebases.¹ TESLA1005, FIG. 3, 6:60-67, 10:41-56, 11:9-24:64.

2. GHC renders obvious generating data structures that include computer models indicating detected object sizes and locations (elements [21.11], [21.14])

In addressing elements [21.11] and [21.14], the Reply reiterates PO's erroneous assumption that GHC does not "detect" object sizes or locations and therefore concludes that GHC cannot meet the limitations in these claim elements because no "detected" information is stored as claimed. Reply, 5-6. The Reply does not otherwise dispute, however, that the data stored in Hickman's LOC field provides a coordinate indicating the location of an object or that the data stored in

¹ Whether robots in GHC locally analyze digital pictures to detect object attributes or whether the detection occurs in the cloud is immaterial to the Substitute Claims, which do not specify where the detection must occur. Even if cloud-based processing were required, Hickman also teaches this option. TESLA1005, 25:28-46 ("cloud processing engine 402 may analyze the image data"), FIG. 4.

Hickman's SPC field (in conjunction with data stored in the model data (MOD) field) provides a computer model indicating the size of an object. *Id.*; Opposition, 20-22. PO is mistaken, however, because as described in the preceding section, GHC *does* disclose and render obvious processes for "detecting" the size and location of an object from digital pictures and updating/storing the detected object size and location in Hickman's knowledge bases. Elements [21.11] and [21.14] are thus rendered obvious by GHC for each of the reasons described in the Opposition.

3. GHC's first and second data structures are both *correlated with the first one or more instruction sets*

PO's argument that GHC does not render element [21.15] obvious because GHC's first and second data structures are allegedly not correlated with the same first one or more instruction sets is wrong. Reply, 6-8. As an initial matter, the Opposition explained that an image like that depicted in Grotmol's FIG. 20A "comprise[s] representations of one or more objects" and provides an example part of a "first circumstance representation," where any two objects depicted in the image provide a "first object representation" and a "second object representation," respectively. Opposition, 19-20; TESLA1004, FIG. 20A, 28:43-39:12. Grotmol further teaches that an image including its multiple object representations can be stored in a training set and correlated with the *same* motor command indications (e.g., a first one or more instruction sets). Pet., 12-16; TESLA1004, Abstract, 3:35-

39, 39:13-19, 43:5-9, 38:38-42. Accordingly, in GHC, each of the data structures that store data for different objects depicted in the same image for the same training set also would be correlated with the same motor command indications (or other types of instructions like those stored in Hickman's TASKS field) ***consistent with Grotmol's express disclosure***. Opposition, 13-16. Nothing about Hickman's role in the proposed combination disturbs this fundamental aspect of Grotmol's teachings, and the Reply identifies nothing to the contrary.

Moreover, and even if Grotmol's correlated training sets are not necessarily carried into the combination as PO's argument assumed (which is not correct), element [21.15] would still be rendered obvious at least when the first and second object representations represent two objects of the same type. This would quite evidently and commonly occur, for example, whenever the robot acquires an image that depicts two or more instances of the same type of object in its environment (e.g., two doors, two cups, two walls, etc.). TESLA1004, 38:43-39:12, FIGS. 20A-20B. In this case, the general object identifier (GID) for the two objects would be the same and the data structures for each object representation would include and be correlated with the same TASKS data (i.e., the same first one or more instruction sets) as each other. TESLA1005, 12:54-55 (the GID "defines a 'type' of object"), 15:28-37 ("an individual general object identifier (GID) may have the following corresponding data: ... task data (TASKS)"), 18:34-65, 19:1-20:20, FIG. 3.

Finally, the Reply fails to explain why even different TASKS data in Hickman's first and second data structures also would not collectively provide the first one or more instructions sets as claimed. In this case, the first data structure would be correlated with the first one or more instruction sets since the first data structure includes a first portion of TASKS data from the first one or more instruction sets and the second data structure likewise would be correlated with the first one or more instruction sets since the second data structure includes additional TASKS data from the first one or more instruction sets.

B. GTC renders obvious elements [21.10]-[21.11] and [21.13]-[21.14]

1. GTC renders obvious object sizes and locations "detected" by processing digital pictures (elements [21.10], [21.13])

Like in the GHC grounds, Petitioner respectfully submits that the Preliminary Guidance reached an incorrect conclusion with respect to the GTC grounds. And in adopting the analysis from the Preliminary Guidance, PO's Reply fails to appreciate that identifying attributes such as location, height, width, and dimension information when processing images would necessarily involve detecting these attributes. TESLA1015, ¶¶83-88. The Preliminary Guidance appears to require Petitioner to explain how the detection is done, but the claim does not recite features directed to how the detection is done. Thus, the Preliminary Guidance imposes a burden on the Petitioner that is not required by the claims.

Moreover, Tolstedt explains that different techniques can be used to classify objects in an image. For example, an autonomous classification or input from a user can be received to detect the size of an object. TESLA1015, ¶84. A user can input a size, and the computer detects the size upon processing the user input. Location can be detected using lidar, sensors, and other algorithms. TESLA1015, ¶84. Thus, to the extent how detection is performed is required, Tolstedt teaches several possible methods to detect a size and location of an object

To the extent, PO questions whether Tolstedt discloses digital images, Tolstedt teaches that its images are acquired through a machine that controls the camera. TESLA1015, ¶82. Acquired camera images are processed for object classification (e.g., using sensor processing algorithms) in a computer system. *Id.* The images processed in Tolstedt's system would have been digital pictures because such processing and classification would only be possible if the images were digital pictures.

2. GTC renders obvious generating data structures that include computer models indicating detected object sizes and locations (elements [21.11], [21.14])

PO alleges that, in GTC, a first data structure including a computer model is not generated. PO Reply, 9-10. But, in GTC, a thematic map is generated based on the classified objects. TESLA1015, ¶83. The '344 patent describes a "data structure" in an exceedingly broad manner. TESLA1001, 65:45-57 ("any variety of

data structures can be used”, “any other type or form of a data structure including a custom one” can be used). Consistent with this definition, Toldstedt’s data structure includes a thematic map that contains a pattern of attributes. TESLA1015, ¶¶83, 84.

PO’s arguments for [21.12]-[21.14] rise and fall with the above arguments.

3. GTC’s first and second data structures are both *correlated with the first one or more instruction sets*

As explained above in Section II.A.3, the set of instructions provided in the first and second data structures can collectively provide the “first one or more instruction sets,” and both data structures are correlated with the first one or more instruction sets.

III. The Claims Recite Patent Ineligible Subject Matter

PO’s arguments appear to hinge on the notion that the claimed subject matter lies “*exclusively in the realm of computers and control systems.*” Paper 34, 1-2. But merely applying an abstract idea to computers is not sufficient to render the claims patentable. Indeed, “[a]n abstract idea does not become nonabstract by limiting the invention to a particular field of use or technological environment, such as the Internet [or] a computer.” *Intellectual Ventures I LLC v. Capital One Bank (USA), N.A.*, 792 F.3d 1363, 1366, 115 USPQ2d 1636, 1639 (Fed. Cir. 2015).

The 2024 Guidance Update on Patent Subject Matter Eligibility, Including on Artificial Intelligence, Fed. Reg., Vol. 89, No. 137 (July 17, 2024) (“**2024 Guidance**”) explains that a claim is not patent eligible merely by reciting additional

elements that amount to no more than a recitation of the words “apply it” (or an equivalent) or are no more than instructions to implement a judicial exception on a computer. 2024 Guidance, 58137. Yet, PO’s substitute claims are guilty of the same by simply applying an abstract idea to a computer. PO has offered no evidence of how the claims “reflect[] an improvement to a computer or other technology” or are significantly more than an abstract idea. While PO claims certain improvements in computer and autonomous device performance, PO does not explain how such improvements are realized, offers no corroborating evidence, and even failed to offer expert testimony, which PO could have and has done so earlier in the proceedings. Paper 34, 3-4.

A. The Claims Are Directed to an Abstract Idea

The 2024 Guidance provides several examples of claims that do and do not recite an abstract idea under (Step 2A, Prong One). The substitute claims are similar to examples of abstract ideas. For instance, the 2024 AI Guidance provides the following two examples of a method of organizing a human activity:

- Claims to “collect[ing] information on a user's movements and location history [and] electronically record[ing] that data;” and
- A claim to “monitoring the location of a mobile thing and notifying a party in advance of arrival of that mobile thing []. 2024 Guidance, 58135.

The proposed substitute claims recite similar features that are directed to collecting circumstance and object representations (when a user is moving) to determine which instruction sets to apply when a user encounters similar circumstances. The “notifying a party in advance of arrival” language is also remarkably similar to the “anticipating” features of the substitute claims. The similarities between the examples and the claimed features at issue here strongly suggest that the substitute claims are not patent eligible.

B. The Claims Recite Well-understood, Routine, Conventional Activity and No Features Amounting to “Significantly More” than the Abstract Idea

As noted above, the evidentiary record in this IPR with respect to subject matter eligibility is woefully lopsided. PO only offers attorney arguments that broadly assert alleged improvements in a computer. PO fails to provide any evidence or explanations of how the improvements are accomplished. In contrast, Petitioner has offered detailed testimony from its expert explaining the routine, conventional nature of the substituted claims. TESLA1010, ¶¶62-64.

Setting aside the lopsided evidentiary record, a quick glance at the substitute claims also confirms that the claims recite well-understood, routine, conventional activity. For instance, the claims recite accessing a memory, circumstance detection (e.g., images of objects) by sensors, generating or receiving circumstance representations, anticipating instruction sets, generating or receiving object

representations, detecting a type, location, and size of an object, and data structures that include labels and coordinates and are correlated with instruction sets. All of these features are well-understood, routine, conventional activity. For instance, using a sensor, such as a camera, to detect circumstances (images) has been well-known routine, conventional activity. Similarly, accessing a memory or database is a notoriously well-known operation of a computer or a human brain. Even a data structure with labels and coordinates is effectively part of any map data structure.

Respectfully submitted,

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/Nicholas W. Stephens/
W. Karl Renner, Reg. No. 41,265
Nicholas Stephens, Reg. No. 74,320
Usman A. Khan, Reg. No. 70,439
Matthew Colvin, Reg. No. 75,201
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
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 August 22, 2024, a complete and entire copy of this Petitioner's Sur-Reply to Patent Owner's Reply to Opposition to Motion to Amend 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