

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

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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 Response (Paper 26) in IPR2023-01055

I. INTRODUCTION

In response to Petitioner’s Opposition (“**Opposition**,” “Opp.,” Paper 31) to Patent Owner’s Motion to Amend (“**MTA**,” Paper 28), Patent Owner (“**Autonomous Devices**” or “**PO**”) offers only conclusory attorney arguments and factually incorrect characterizations of the prior art references backed by no expert testimony to distinguish its substitute claims from the prior art. PO’s Reply (Paper 34) failed to recognize the oversights in the Preliminary Guidance (“**PG**,” Paper 32) with respect to the 35 U.S.C. §§103 and 101 grounds. As explained in more detail below, the PG erred in finding that each of the Grotmol and Hickman combination (“**GHC**”) and the Grotmol and Tolstedt combination (“**GTC**”) fails to teach that information on the same objects is included in the first and second data structures, which are respectively correlated with first and second instruction sets. Likewise, PO’s Reply (Paper 34) offered no substantive analysis of its amendments with respect to 101 case law other than conclusory statements. For these reasons, the Board should find all substitute claims unpatentable and invalid¹.

II. THE SUBSTITUTE CLAIMS ARE OBVIOUS BASED ON THE

¹ The Board has previously revised its findings in a Preliminary Guidance and should do the same in this proceeding. *Medytox, Inc. v. Galderma S.A.*, no. 22-1165 (Fed. Cir. Jun. 27, 2023), affirming *Galderma, S.A. v. Medy-Tox Inc.*, PGR2019-00062, Paper 66 (PTAB July 16, 2021).

**GROTMOL-HICKMAN COMBINATION (“GHC”) AND THE
GROTMOL-TOLSTEDT COMBINATION (“GTC”)**

The PG preliminarily determined that the asserted prior art does not render obvious the following features of claim 21: 1) “a second data structure that includes: labels indicating types of *the* multiple objects, and coordinates indicating locations of *the* multiple objects;” (referred to herein as the “first feature”); and 2) “wherein the first data structure *is correlated with* the first one or more instruction sets for operating the first device; and wherein the second data structure *is correlated with* the second one or more instruction sets for operating the first device” (referred to herein as the “second feature”). Paper 32, 10-14.

A. GHC teaches multiple data structures including information for the same multiple objects

Regarding the first feature, the PG found that “Petitioner has not sufficiently explained where or how Hickman discloses or renders obvious multiple data structures that (i) each include information (type and locations) for the *same* multiple objects (as detected at different times or time periods) and (ii) are each correlated with instruction sets for operating a device.” Paper 32, 12. However, the PG erred by focusing on Hickman alone and not fully accounting for Grotmol’s role in the combination. Indeed, *Grotmol itself discloses and renders obvious a knowledgebase having multiple data structures (e.g., training sets) that each include images representing the same set of multiple objects correlated with*

respective motor commands (e.g., first and instruction sets). Hickman does not disturb this basic aspect of Grotmol’s teachings in the GHC.

In particular, the Opposition referred to image 2000 in Grotmol’s FIG. 20A as “an example part of” the claimed “first circumstance representation” and image 2010 as “an example part of” the claimed “second circumstance representation.” Opp., 18-19; TESLA1004, 38:43-40:63, 42:37-45. Image 2000 and image 2010 each depict the *same objects*—including a tree (highlighted in blue), a circle (highlighted in green), and a rectangle (highlighted in red)—shifted, in part, because these images were taken by a camera on a moving robot at different times.

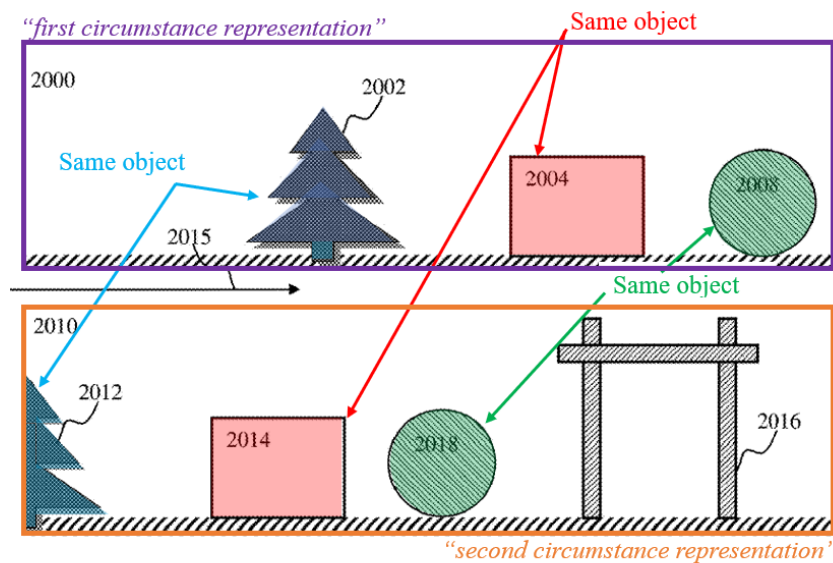


FIG. 20A

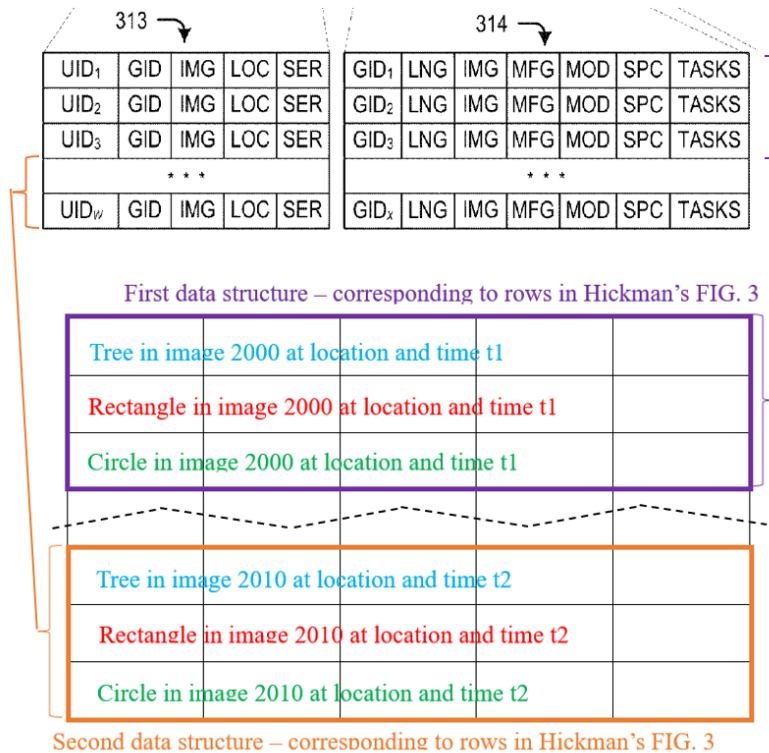
TESLA1004, FIG. 20A.

During training, Grotmol’s robot creates and stores distinct “training sets” for each image in a sequence of acquired images, e.g., images 2000 and 2010. TESLA1004, Abstract (“A robotic vehicle may utilize a camera and *stores the*

sequence of images of a visual scene ...”), 39:64-40:4 (“the primary particle set may comprise *a previously used image I0 (e.g., 2000 in FIG. 20A)*, one or more (e.g., 2) images *preceding the I0 image in time* in the training buffer, and one or more (e.g., 5) images *following the I0 image in time* in the training buffer”), 3:35-39, 38:38-42, 39:13-19, 43:5-9, FIG. 15. A training set correlates a given image with motor control commands. *Id.*, 3:35-39.

The Opposition explained how it would have been obvious to apply Hickman’s teachings to Grotmol, thereby implementing a knowledgebase in the cloud that would “facilitate the sharing of knowledge between[] various client devices” and further modifying “Grotmol’s storage structure to include one or more knowledge bases with Hickman’s data structures.” Opposition 12-13. The relevant differences between Grotmol’s solution and the GHC are simply that Grotmol’s training sets in the GHC are accessible to multiple devices by the cloud and are stored in data structures like those described in Hickman. Pet., 63-64 (“the shared knowledge base[] would include training sets”). In this context, it would have been obvious that the first data structure in the GHC would predictably stores information about the multiple objects in image 2000 at time t1 and would have included *at least some objects*, such as the tree, rectangle, and circle, *that are the same* as objects in image 2010 (at time t2) for which information is stored in the second data structure, consistent with Grotmol’s teachings. Opp., 24-25.

Relatedly, the Opposition cited Dr. Janet’s explanation that “[i]t would have been obvious to a POSITA that, in the GHC, a row or set of rows in Hickman’s structure 314 (or 313) that include Grotmol’s image 2000 and objects therein may correspond to the ‘first data structure,’ and a row or set of rows in Hickman’s structure 314 (or 313) that include Grotmol’s image 2010 and the same objects therein may correspond to the ‘second data structure.’” TESLA1010, ¶87; Opp., 22. One example of this is provided in the illustration below.



B. In GHC, the first and second data structures are *correlated with* the first and second one or more instruction sets, respectively

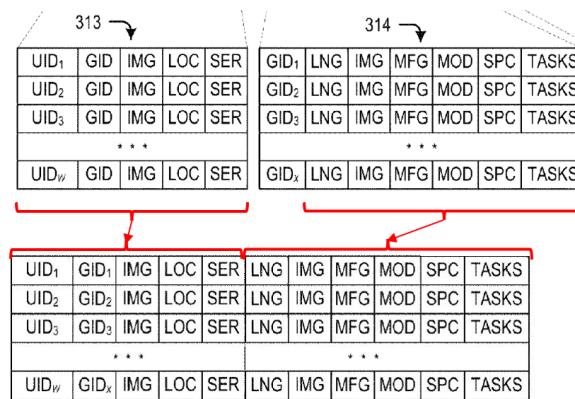
As discussed above, in the GHC, a first one of GHC’s training sets corresponds to the “first data structure” and a second one of GHC’s training sets

corresponds to the “second data structure.” Pet., 58-64; Opp., 12-22. Grotmol’s training sets themselves correlate circumstance representations (e.g., images of a robot’s environment) with instruction sets (e.g., motor commands). Pet., 12-15; TESLA1004, 3:35-39, 39:13-19, Abstract. Thus, the images 2000 and 2010 as depicted in FIG. 20A, including the representations of objections depicted therein, are correlated in different training sets with respective motor control commands (i.e., first and second instruction sets). *Id.* Even when Hickman’s data structures are applied to Grotmol’s training sets, the correlations remain and therefore meet the limitations of the substitute claims. PO’s Reply contends that Hickman’s data structure (313) does not correlate the object location (e.g. LOC) and type (e.g., GID) data provided in that data structure with the TASKS data in data structure 314 where instruction sets are stored. Reply, 6. Not so. Data structure 313 specifically links each unique object to a corresponding general object in data structure 314 via the general object identifier (GID), and each general object entry in data structure 314 includes corresponding TASKS data. TESLA1005, 12:5-67, 12:54-55, 14:61-15:56, 18:44-20:20, FIG. 3. Each row in data structure 313 is therefore correlated with TASKS data from data structure 314.

Further, Hickman provides that TASKS data can be included in the same data structure as data from other fields in *both* data structures 313 and 314 that characterize the location and type of objects. Opp., 24-25. In some implementations,

the TASKS data is correlated with the data structure of which it is a part (which is not disputed in either PO's Reply or the PG). *Id.*; TESLA1010, ¶90. Even though Hickman's FIG. 3 illustrates one example where the TASKS data in structure 314 is stored apart from data structure 313, Hickman contemplates other configurations that provide a merged data structure including object location, type, *and* task fields. TESLA1005, 10:57-11:7; TESLA1010, ¶67; Opp., 13, 15.

To illustrate an example of a “single common knowledge base” as taught in Hickman, consider the following figures in which data structures 313 and 314 are combined by directly linking each entry in data structure 313 with the corresponding fields in data structure 314 associated with the same GID.



Derived from TESLA1005 (Hickman), FIG. 5.

In this straightforward implementation, Hickman's consolidated data structure provides an entry for each object that includes a unique identification (UID), an image, a label indicating a type of the object (e.g., GID or other “type” information (TESLA1005, 14:63-67), a label indicating coordinates for a location

of the object (e.g., LOC), and additional information. This arrangement of data is not only expressly within the scope of Hickman's teaching of a "single common knowledgebase," but is also a simple matter of design choice well within the skill of a POSITA. TESLA1005, 10:57-11:7; TESLA1010, ¶68.

C. GTC teaches multiple data structures including information for the *same* multiple objects

In GTC, like GHC, the "first circumstance representation" and "second circumstance representation" correspond to images 2000 and 2010, respectively in Grotmol's FIG. 20A. Opp., 18-19. The first and second data structures correspond to two respective thematic maps that include labels and coordinates of multiple objects around a vehicle at two different times and locations. Opp., 22-23.

Returning to Grotmol's images 2000 and 2010 in FIG. 20A, as explained above, the same objects are explicitly apparent because between times t1 and t2, the same tree, rectangle and ball can still be seen. TESLA1004, FIG. 20A. A POSITA would have understood that when thematic maps based on these two images are created and the location and type of information is provided in the maps, the two data structures would have included information on the same multiple objects.

D. In GTC, the first and second data structures are *correlated with* the first and second one or more instruction sets, respectively

As explained in the Opposition, Tolstedt's system determines which actions ("one or more instruction sets for operating the first device") for a vehicle to take in

association with a detected object (e.g., performing object avoidance). TESLA1015, ¶¶83-88; Opp., 24. For example, Tolstedt's knowledge base provides information to a machine control process 602 to "determine which commands [{"instruction sets"}] to send to the vehicle's steering, braking, and propulsion components." TESLA1015, ¶84. A thematic map, including classified objects, is then used to "plan actions for the vehicle." TESLA1015, ¶83. Accordingly, it would have been obvious to a POSITA that the first thematic map ("first data structure") would have been correlated to the vehicle commands/actions ("the first one or more instruction sets for operating the first device") for the object and location shown in Grotmol's image 2000, and the second thematic map ("second data structure") would have been correlated to the vehicle commands/actions ("the second one or more instruction sets for operating the first device") for the same object and location shown in Grotmol's image 2010. For instance, the instructions in the second data structure would also include instructions to avoid objects such as the tree, circle, rectangular, and event object 2016.

E. In GTC, a thematic map is a data structure

The '974 patent describes a "data structure" in a 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). Tolstedt discloses a thematic map that contains a pattern of attributes that include classified objects. The objects

include dimensional information, such as location, height, width, and color. TESLA1015, ¶¶83, 84. Thus, a thematic map is a data structure that includes data fields with attribute information consistent with the description of a "data structure" in the '974 patent. And with this understanding, it would have been obvious to a POSITA that a thematic map is a data structure, contrary to PO's assertions.

III. The Claims Recite Patent Ineligible Subject Matter

PO's §101 arguments hinge on the notion that the claimed subject matter lies "*exclusively in the realm of computers and control systems.*" Paper 34, 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 performance, PO’s Reply 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, 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 the 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 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 strongly suggest that the 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 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 representations, 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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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:

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