

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner,
v.
iQAR INC.,
Patent Owner.

Case No. IPR2024-00499
U.S. Patent No. 10,829,002 B2

PATENT OWNER'S PRELIMINARY RESPONSE

I. INTRODUCTION

Patent Owner iQar Inc. submits this preliminary response to Tesla, Inc.’s Petition for *Inter Partes* Review (Paper 1, the “Petition”) of U.S. Patent No. 10,829,002 (the “’002 patent”).

The Petition has not established that there is a reasonable likelihood of success in connection with any challenged claim. There are fundamental differences between the ’002 patent’s claims and the primary prior art reference on which the petition here relies (Kudo 325). The ’002 patent discloses—and the claims require—a system and method that predicts a vehicle’s destination by analyzing sensor data collected and stored over portions or “segments” of a vehicle route. In contrast, Kudo 325 employs only sensor data—which it formats but does not analyze—associated with individual points or “nodes” through which a vehicle traveled. Because of this, multiple, required claim elements are missing from the prior art of record.

First, none of the prior art teaches “analyz[ing]” collected and stored “telemetry” and “driver-related” sensor data to “detect a pattern” as all the ’002 patent’s claims require. The purported “pattern[s]” identified in the Petition are merely the collected sensor data itself: “condition” data, such as vehicle position, time/date, and driver identity information collected by the systems of Kudo 325 and Kudo 066. The Petition never explains how this collected data is “analyz[ed],” how

“telemetry” and “driver-related” data are both used together in any purported “analys[is],” or what “pattern” is detected following any such “analys[is].” This, however, is what the ’002 patent claims at issue require.

Second, the prior art also does not teach the storage of the type of “historical data” required by the ’002 patent’s claims. Again, Kudo 325—the primary reference in the Petition—stores only information relating to particular points or locations (which it calls “nodes”) through which a vehicle previously traveled. The claims here require more: “data ... regarding” “multiple route segments” (portions of a route, not just individual points along a route) and “multiple sequences of route segments” (sequential portions of a route) must be stored.

Finally, none of the prior art teaches “predicting a destination” using the types of data required by the ’002 patent’s claims. The claimed “predict[ion]” must be based on both the detected “pattern” and the specific types of stored “historical data.” As the prior art identified in the Petition neither detects a “pattern” nor stores the required “historical data” it also cannot make the claimed type of prediction.

II. ARGUMENT

A. The ’002 Patent’s Invention

The ’002 patent relates to “methods and systems for controlling power applied to a vehicle....” (Ex. 1001, 1:15-16.). The patent explains that “FIGS. 1A and 1B compare a traditional ‘cruise control’ device (in FIG. 1A) to” the patent’s “power

management device ... (in FIG. 1B).” (*Id.*, 6:51-53.) In Figure 1A, “[a]s the vehicle moves across ... roads having different elevations ..., or through different weather conditions, the traditional cruise control device adjusts the power supplied to the vehicle[] (and thus the speed) based only on the set velocity” and the vehicle’s current condition. (*Id.*, 6:53-64.) In other words, in prior art systems, speed and power determinations are made for individual points along a travel route. (*See id.*)

This type of “velocity control ... cruise control device” is different from that of the ’002 patent shown in FIG. 1B. (*Id.*, 6:64-65.) In that figure, “the power management system receives ... information” regarding “the location and grade (e.g., steepness of any uphill/downhill portions) of the road, the distances traveled.” (*Id.*, 7:1-4.) Using this, along with “information about the state of the vehicle,” “the power management system may calculate applied power to the engine, and may derive a speed (or set of speeds) that optimizes the applied power.” (*Id.*, 7:8-17.) By tailoring the vehicle’s speed and applied power to better match variations along the route to be traveled—such as grade, wind resistance, and the like—the ’002 patent reduces power consumed by the vehicle compared to a typical “cruise control system.” (*Id.*, 7:17-21.)

Fundamental to the ’002 patent’s power management system is the ability to “deduce[] information about the” vehicle’s destination and “route.” (*Id.*, 7:4-8.) Once determined, the route “may be broken up into segments that may be used by

[the] power management device to optimize the power needed to travel th[e] segment.” (*Id.*, 14:2-5.) “The more segments that the route is split into, the more accurate” the power optimization. (*Id.*, 14:30-34.)

According to the ’002 patent, the vehicle’s destination—and thus the route it will travel—may either be “explicitly provided by the operator ... or it may be derived” to determine the vehicle’s “most likely destination[.]...” (*Id.*, 11:51-12:17; *see also id.*, 2:65-3:3 (noting that the system is able to “infer the driver’s destination based on ... the information inputs to the system”).) As part of this, the system receives various “inputs” or “information” relating to the operator, the vehicle, and the vehicle’s environment. (*Id.*, 7:27-38.) This “information” “may be directly measured (e.g., by sensors or other inputs) ... or it may be derived from other information inputs....” (*Id.*, 7:38-41.) “The power management device may” also “refer to a record of historical route information” when determining the vehicle’s route and destination. (*Id.*, 17:31-35.) This record can include a “memory or data structure that holds information on routes or segments [of] routes that the vehicle has previously travelled.” (*Id.*, 17:32-35.) Importantly, data regarding portions or “segments” of routes is stored, not just data regarding individual points or locations. (*See id.*) This enhances the system’s ability to “determine a probable optimal speed at each point along a route.” (*Id.*, 17:56-59.)

B. The Petition Has Failed to Establish a Reasonable Likelihood of Success

Independent claims 1, 15, and 16 are the only independent claims at issue. Petitioner makes the same general argument in connection with each of these claims. Kudo 325 is cited for most claim elements. In particular, according to Petitioner, Kudo 325 purportedly teaches a system that collects sensor data and predicts a vehicle destination using that sensor data and stored historical data. (*See* Petition at 5-11.) Petitioner relies on another reference—Kudo 066—for its teachings of vehicle position determination via GPS and storage of position information using a server. (*Id.* at 11-12.)

As explained below, this combination of art does not teach what claims 1, 15, and 16 of the '002 patent require. The art fails to disclose multiple, required claim elements. Thus, Petitioner has not carried its burden to show that there is a reasonable likelihood that it will prevail with respect to any of the challenged claims.

1. *“analyz[ing] said sensor data samples ... to detect a pattern”*

Claims 1, 15, and 16 all require “analyz[ing] said sensor data samples ... to detect a pattern.” The claims also include additional elements specifying the origin and nature of the “sensor data” that must be “analyz[ed].” In particular, the collected (and later analyzed) “sensor data” must include at least “telemetry data” and “driver-related” data. And it must be “stor[ed] ... for different points in time along a route” or “route segment.” (Ex. 1001, Claims 1, 15, 16.) In sum, it is ***not enough*** to simply

collect sensor data. The claimed *types* of data must be collected, and then *this* data must *also* be “analyz[ed]” to “detect a pattern.” The Petition fails to explain how Kudo 325 and Kudo 066 teach this.

As noted in the Petition, the systems of Kudo 325 and Kudo 066 collect various types of sensor data. This includes “information about the vehicle’s current trip, including ‘a route from departure to the current node,’ current position (e.g., node ID), and time/date” information. (*See, e.g.*, Petition at 38; *see also id.* at 27-31.) Other examples include “driver identity information ... e.g., from a camera.” (*Id.* at 31-32.)

The Petition also references certain formatting of this collected sensor data performed by Kudo 325. For instance, collected “position sensor data samples are converted into node IDs for more convenient processing and storage.” (*Id.* at 27 (citing Ex. 1005, [0068].) And other information—like collected “[t]ime and date information”—can also be “received in a form that is readily decipherable to a human or as raw data....” (Petition at 30.) In one example, Kudo 325 explains that more specific time/date information can be “processed” to change its “abstraction degree.” (Ex. 1004, [0114], [0118]-[0119].) For example, a collected “time condition” can be abstracted or generified by converting it to “morning,” “afternoon” or “evening.” (*Id.*, [0129], [0137].) According to the Petition, regardless of its form,

this “[t]ime and date information” constitutes “sensor data samples.” (Petition at 30.)

Again, the ’002 patent’s claims require not just the collection and storage of “sensor data samples,” but also that these samples be “analyz[ed]” “to detect a pattern.” The Petition falls short when it attempts to explain how the systems of Kudo 325 and Kudo 066 allegedly detect a “pattern.” Each of the Petition’s arguments will be discussed in turn below.

The Petition first argues that Kudo 325’s ability to accumulate “date and time conditions” “for [a] current trip”—for instance by recording that it is a “weekday”—somehow constitutes “detect[ing] a pattern.” (*See, e.g.*, Petition at 39.) But the Petition previously identified the time/date information stored by Kudo 325’s system as the claimed “sensor data samples.” (*See id.* at 30-31.) The ’002 patent similarly explains that time/date information is simply sensor data, not a pattern. (*See, e.g.*, Ex. 1001, 8:23-27 (“directly” received “sensor[] ... inputs” include “a pre-set clock (e.g., for the current time and date)”).) While Kudo 325 does explain that its system can render collected time/date information more “abstract[]” (*e.g.*, Ex. 1004, [0118]), this does not transform the sensor data into a “pattern.” Whether or not the vehicle is passing through a node on a “weekday,” “afternoon,” or “evening” is simply more abstract, less specific time/date information. The format of the time/date information has changed. But no pattern has been detected.

In any event, even if one did consider Kudo 325's formatting and abstraction of time/date information into something more generic like "weekday" to be "detect[ing] pattern" (it is not), the '002 patent's claims would still not be satisfied. The claimed "pattern" must be detected by analyzing both driver-related data and telemetry data. Kudo 325 determines that it is a "weekday" using only time/date information. (*See, e.g.*, Ex. 1004, [0129].) The Petition fails to identify any role played by the "telemetry data" or "driver-related ... data" separately collected by Kudo 325's and Kudo 066's systems in the determination that it is a "weekday." This is understandable because whether it is a "weekday" depends only on time/date, not on who is driving the vehicle, where it is located along a route, or other vehicle sensor measurements.

Next, the Petition similarly argues that "conditions including 'weekday,' 'afternoon,' 'summer,' 'C9,' and 'L6 to C9'" are "a pattern." (Petition at 41.) But this is also simply time/date, position, and information that the Petition previously identified as "sensor data samples." (*See id.* at 27-31, 38.) Again, the mere fact that Kudo 325 has abstracted the time/date information does not transform it into a "pattern." Similarly, Kudo 325's "conver[sion]" of position information "into node IDs for more convenient processing and storage" (*id.* at 27) also does not constitute "detect[ing] a pattern." While formatted differently, the node IDs continue to be nothing more than position information.

Petitioner relatedly argues in a footnote that the “set of sensor data samples” assembled by Kudo 325’s system can itself be the claimed “pattern.” (*See id.* at 40 n.6.) But this cannot be. The ’002 patent’s claims separately require (1) collection and storage of “sensor data samples” and (2) “analyz[ing]” the collected and stored “sensor data samples ... to detect a pattern.” (Ex. 1001, claims 1, 15, 16.) The mere collection of a set of sensor data samples cannot itself constitute “detect[ing] a pattern.” Otherwise, the further requirement that the samples be “analyz[ed]” to “detect a pattern” would be read out of the claims. *See Power Mosfet Techs., L.L.C. v. Siemens AG*, 378 F.3d 1396, 1410 (Fed. Cir. 2004) (explaining that claim “interpretations that render some portion of the claim language superfluous are disfavored”).

Consistent with this, the ’002 patent itself recognizes that there is a distinction between information that is “directly measured” or obtained from sensors, and information “derived from other information inputs” (*See, e.g.*, Ex. 1001, 7:38-41; *see also* 3:66-4:4 (similarly noting that information can be directly detected or derived); 4:47-52 (discussing both “operational parameters” and “derived ... information”); 12:47-58 (distinguishing “information inputs” from “information derived from these inputs” like “driver identity, driving habits, etc.”).) The claims here—via their requirement that sensor data be “analyz[ed]” to “detect a pattern” —

likewise require more than simply directly collecting and using sensor data. That data must be analyzed after it is collected, and a pattern must be detected.

The Petition also references one final purported “pattern” supposedly detected by Kudo 325’s and Kudo 066’s systems. In particular, “[i]nformation on a driver” can be used as “[k]ey information serving as a condition for retrieval” ... “in addition to position and time/date.” (Petition at 41.) Once again, this is simply the sensor data collected with Kudo 325’s system. (*See id.* at 26-28 (identifying “position” information as “sensor data”); 30-31 (identifying “time/date” information as “sensor data”); 31-32 (identifying “driver identity information” as “sensor data”).) The fact that this sensor data is used as a “key” to access data stored in Kudo 325’s various data structures does not make it a “pattern.” The nature of the sensor data remains the same: it is still position, time/date, and driver information data. It is simply used to match other sensor data stored by Kudo 325’s data structures. (*See, e.g.*, Ex. 1004, [0093]-[0094] (explaining that collected “state information” like position and time/date can be used as a “retrieval key” to locate a matching node in Kudo 325’s “transition state information”).) The claims require more than the mere use of a sensor data to locate matching entries in a database. Once again, the sensor data must be “analyz[ed]” “to detect a pattern.” Then, it is this “pattern”—along with “historical data”—that must be employed for purposes of “predict[ing] a destination.” (*See* Ex. 1001, claims 1, 15, and 16.) Patent Owner, however, re-

writes the claims to require use of only the collected sensor data itself to predict a destination. This is not what the claims require.

In sum, the Petition identifies no “pattern” in Kudo 325 and Kudo 066, let alone a “pattern” that is “detect[ed]” by “analyz[ing]” both “telematics” and “driver-related” data as all the ’002 patent’s claims require. The Petition points only to collections of sensor data that Kudo 325 uses to access its database of stored information. Petitioner’s expert adds nothing to this deficient analysis. Instead, the expert merely repeats the Petition’s arguments almost verbatim. (See Ex. 1003, ¶¶ 127-133)

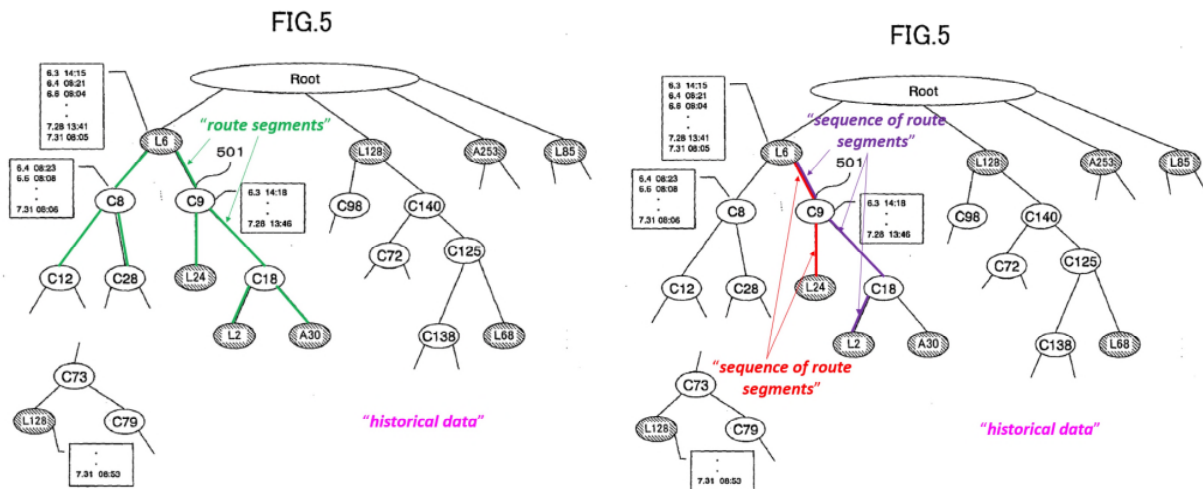
2. ***“historical data compris[ing] ... data, regarding multiple route segments ... data, regarding multiple sequences of route segments”***

Next, claims 1, 15, and 16 all also require storage (and then use) of specific types of “historical data.” This “historical data” must include “data ... regarding multiple route segments” and “data ... regarding multiple sequences of route segments.” In other words, data regarding ***portions*** of a route (and not just ***individual points*** along a route) must be stored. The Petition also failed to establish that the prior art teaches what this element requires.

To begin, a “route segment” is plainly more than a single point along a route. The ’002 patent explains that a “segment” “may comprise any distance to be traveled, including the entire route, or small portions of the route.” (Ex. 1001, 14:2-

8.) In one example, “[t]he entire route ... may be divided up into N segments.” (*Id.*, 14:30-34; 18:24-27 (similar).) Put another way, a “route segment” is some portion or fraction of the “route” being traveled by a vehicle. Such a route “segment” is different from single points along a route, which the ’002 patent alternatively refers to as “segment destination[s],” “intermediate” destinations, “intersection[s],” or “junctions.” (*Id.*, 5:21-25; 12:65-13:12.)

The Petition seems to agree that this is what the term “route segment” means in the ’002 patent’s claims. Rather than identifying the “nodes” stored by Kudo 325 as “route segments” (the nodes represent individual points along a route), the Petition instead highlights the *space* between these nodes. An example of this is shown in the below annotated versions of Figure 5 of Kudo 325 in the Petition:



(Petition at 54-56.) According to the Petition, green annotated “connections between nodes” in the figure to the left are purportedly stored “route segment[s]” because they “represent[] a portion (e.g., segment) of a route extending from a starting node

to a destination node.” (*Id.*) The red and purple annotations in the figure to the right purportedly show stored “sequences of route segments.” (*Id.* at 55-56.) So, per Petitioner, only “portion[s]” of a route—not individual points or locations—constitute “segments.”

While the Petition is of course correct that a “route segment” must span a “portion” of a route, it mischaracterizes the data that Kudo 325 actually stores. Kudo 325 stores only two types of data, neither of which are the types of “historical data” the ’002 patent’s claims require.

First, as shown in Figure 3, Kudo 325’s system stores a record of an entire route. (*See, e.g.*, Ex. 1004, Fig. 3; *see also id.*, [0087] (noting that “travel history” can be stored in “segments” “from engine start (travel start) to engine stop (travel end),” “from departure from home to going back home,” or for an entire “day”).) The Petition does not allege that this constitutes storing “data ... regarding route segments” or “data ... regarding multiple sequences of route segments.” Instead, the Petition points only to Figure 5 when attempting to explain why the prior art teaches the storage of the types of “historical data” the claims here require. (*See* Petition at 54-56.)

Figure 5 depicts the storage of the second type of data referenced in Kudo 325. Kudo 325 calls this “transition state” data. (Ex. 1004, [0093].) Here, a collection of “nodes” (intersections, landmarks, or specific areas through which a

vehicle has passed) are stored in a tree-like data structure. (*See id.*, ¶¶ [0081]-[0085], [0093].) Each node includes “state information” like “dates and times” “indicating that the automobile departs from, passes through or arrives at the node (data indicated in rectangular areas in FIG. 5)...” (*Id.*, [0093]-[0094].) While Kudo 325 is not entirely clear on exactly what form this data takes, the data structure also includes “transition state” data for each node. (*See id.*) This can include “histories of past node transition[s] from the respective nodes as base points.” (*Id.*, [0093].) This appears to essentially be—for any given node—a list of (or pointers to) all other nodes to which the vehicle previously traveled from that node. (*See id.*) Thus, example node C9 in Figure 5 will list both nodes L24 and C18, as the vehicle traveled to both these nodes from C9 at some point. (*See id.* at Fig. 5.) “[I]nformation relating to the degree of transition” from one node to another can also apparently be stored. (*See id.*, [0093].)

This is not the type of “historical data” required by the ’002 patent’s claims. No “data ... regarding multiple route segments” (*i.e.*, portions of a route) is stored. Instead, Kudo 325 simply stores data relating to individual **points** along a route. Again, each of Kudo 325’s “nodes” represent specific “intersections, landmarks [or] area names” passed by a vehicle. (*Id.*, ¶ [0081].) And Kudo 325’s “transition state information” includes only, for each node, (1) the dates/times when a vehicle passed through the node (the data in the “rectangular areas” shown in Figure 5) and (2) a

list of other possible nodes the vehicle previously went to from that node (the “transition state information”). (*See id.*, [0093].) No “data ... regarding ... route segments”—data relating to portions of a route traversed by a vehicle—is stored. Point specific data provides no information regarding an actual route, or a portion of an actual route that was traveled. In other words, Kudo 325’s transition state information is simply information about what occurred (or could possibly occur) at particular points.

Moreover, no “data ... regarding multiple sequences of route segments” is stored. Even if one considered Figure 5’s storage of a list of (or pointers) to possible adjacent node transitions to constitute the storage of “route segments” (it is not), each node will include only a list of immediately adjacent nodes. No node stores any list or sequence of nodes beyond those that are immediately adjacent. As a result, there would be only storage of “route segments” and no storage anywhere in Kudo 325’s transition state information of “*sequences* of route segments.” The claims here require storage of “data ... regarding” “multiple” such sequences.

Petitioner does not account for the differences between how Kudo 325 patent stores data and what the claims of the ’002 patent requires. Instead, it simply assumes that—because it can draw lines purportedly corresponding to route segments onto Figure 5—Kudo 325 already stores “data ... regarding multiple route segments” and “data ... regarding multiple sequences of route segments” as the

claims require. But this is not what Kudo 325 actually stores. It only stores data relating to individual nodes or points. By failing to recognize the differences between how Kudo 325 stores historical data and the “historical data” in the ’002 patent’s claims, the Petition has not met its burden. Petitioner’s expert does no better and once again does nothing more than repeat the Petition. (See Ex. 1003, ¶¶ 151-165.)

Similarly, neither the Petition nor Petitioner’s expert explain why a POSITA would have considered it obvious to modify Kudo 325’s “transition state information” to store not just node-specific data, but also “data ... regarding” “multiple routes segments” and “multiple sequences of route segments.” Instead, both incorrectly assume that Kudo 325 already teaches what the claims require. “The petitioner’s petition ... guide[s]” the scope of an IPR proceeding. *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1355-56 (2018). Here, the only allegation in the Petition is that Kudo 325’s “transition state information” already includes the “historical data” required by the claims. It does not.

3. “predict[ing] a destination”

Claims 1, 15, and 16 all also require “predicting a destination of a driver.” This “predict[ion]” must be made “in response” to both the detected “pattern” and the required types of stored “historical data.”

The systems of Kudo 325 and Kudo 066 do predict a vehicle's destination. But they do not do so "in response" to either a "pattern" or the types of "historical data" the '002 patent's claims require. As explained above, neither reference teaches "detect[ing] a pattern." Rather than analyzing the sensor data it collects to detect a "pattern," in Kudo 325 the vehicle's "condition" (the position, date/time, and driver identity information detected by sensors) is itself used as a "key" to query stored information relating to "histories of travels among intersections." (*E.g.*, Ex. 1004, [0093].) And rather than storing and assessing the type of "historical data" required by the claims—"data ... regarding" both "multiple route segments" and "multiple sequences of route segments"—Kudo 325 stores and assesses only data relating to particular "nodes" or points through which a vehicle has previously traveled. (*See id.*) In other words, any "predict[ion]" of a destination made by Kudo 325 or Kudo 066 is not premised on the types of data the claims of the '002 patent require.

III. CONCLUSION

For the above reasons, Patent Owner respectfully requests that the Board deny institution of *inter partes* review of the '002 patent.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

The undersigned certifies that the foregoing paper complies with the type-volume limitation in 37 C.F.R. § 42.24. According to the utilized word-processing system's word count, the paper—excluding any portions mentioned in § 42.24(a)(1)—contains 3,943 words.

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CERTIFICATE OF SERVICE

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