

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

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

Case No. IPR2024-00543
U.S. Patent No. 10,882,399 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. 10,882,399 (the “’399 patent”).

The Petition has not established that there is a reasonable likelihood of success in connection with any challenged claim. There are numerous fundamental differences between the ’399 patent’s claims and the prior art references on which the Petition here relies (Hongo, Obradovich, and Niki).

The ’399 patent discloses—and the claims all require—a method and system that determines a “segment of a vehicle route” and then calculates the electric power that needs to be applied “to the vehicle to travel along the segment” at a “calculated speed.” In other words, the patent requires a *prospective* determination: the electric power needed to travel along a *not yet traveled* segment of a vehicle route at a certain speed must be determined.

This is not what the prior art teaches. Hongo—the primary reference on which the Petition relies—is directed to an active cruise control system. It does not consider and is unaware of the vehicle’s route. And rather than making a power/speed determination for a not yet traveled route segment, Hongo considers only the vehicle’s *current* position and condition when calculating the speed at which the cruise control system should *currently* be set. Neither Obradovich nor

Niki fix this problem. Obradovich relates to a voice-controlled multimedia system for a vehicle. Niki teaches a hybrid vehicle that also makes vehicle power determinations based on the vehicle's *current* condition.

II. ARGUMENT

A. The '399 Patent's Invention

The '399 patent relates to “methods and systems for controlling power applied to a vehicle....” (Ex. 1001, 1:17-18.) 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.*, 6:61-63.) 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.*, 6:63-7:7.) In other words, in prior art systems, speed and power determinations are continuously made for individual points along a travel route as the vehicle travels past those points. (*See id.*)

This type of active or continuous “velocity control ... cruise control device” is different from that of the '399 patent shown in FIG. 1B. (*Id.*, 7:7-10.) 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” along the “route” the vehicle will be traveling. (*Id.*, 7:11-18.) 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.*, 7:8-27.) By tailoring the vehicle’s speed and applied power to better match the route the vehicle is expected to travel, the ’399 patent reduces power consumed by the vehicle compared to a typical “cruise control system.” (*Id.*, 7:24-31; Figs. 1A-1B.)

Fundamental to the ’399 patent’s power management system is the ability to “deduce[] information about the” vehicle’s destination and “route.” (*Id.*, 7:14-16.) 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.*, 14:5-32.) “The more segments that the route is split into, the more accurate” the power optimization. (*Id.*, 14:38-45.)

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

The ’399 patent includes two independent claims: 1 and 11. (*See generally* Ex. 1001.) The Petition makes the same basic argument for both claims. The Petition relies on Hongo (Ex. 1005) for most claim elements. (*See* Petition at 4-11.) Hongo teaches an active cruise control system for a vehicle that determines the vehicle’s current position and collects various other condition information from sensors. It then uses the position and condition information to query stored driving history data to determine the appropriate speed for the current position/conditions.

(*See id.*) The Petition relies on another reference—Obradovich (Ex. 1008)—only for its teaching of a cruise-control system that receives “voice commands.” (*See* Petition at 12.) And the Petition relies on a third reference—Niki (Ex. 1009)—because it teaches a hybrid vehicle that apportions the power being requested by a vehicle between an internal combustion engine and an electric motor. (*See* Petition at 21-25.)

As explained below, this combination of art does not teach what independent claims 1 and 11 of the ’399 patent require. 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. *“[D]etermining a segment of a vehicle route” then “applying calculated electric power to the vehicle to travel along the segment of the vehicle route at a calculated speed”*

The method of claim 1 requires first “determining a segment of a vehicle route” and then “applying calculated electric power to the vehicle to travel along the segment of the vehicle route at a calculated speed.” (Ex. 1001, Claim 1.) The system of claim 11 must similarly first “calculate electric power and speed over a segment of a vehicle route” and then “apply calculated electric power to the vehicle to travel along the segment of the vehicle route at the calculated speed.” (*See id.*, Claim 11.)

Before addressing the Petition’s allegations, and because Petitioner has largely ignored the claims’ words, Patent Owner will briefly discuss what the claims require.

This discussion should not be taken to mean that formal claim constructions are required. The claims themselves are clear enough.

To begin, both claims 1 and 11 reference “a segment of a vehicle route.” Before such a “segment” can be determined, plainly some information must be known about the “route” being traveled by the vehicle. Otherwise, the determined “segment” of claim 1 (or the “segment” used for calculations in claim 11) would not be “a segment of *a vehicle route*” as the claims require.

This is what the '399 patent discloses. As Figure 2 shows, “a route is determined 201 from the starting position” and “an actual or estimated ending position.” (*Id.*, 11:44-50.) Then, after it has been determined, the “route is segmented 203 into one or more segments.” (*Id.*, 11:50.)

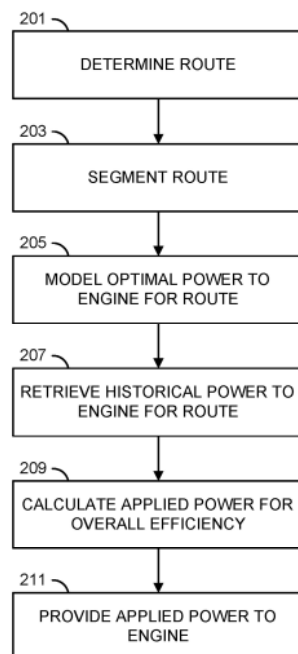


FIG. 2

(*Id.*, Fig. 2.) Indeed, the '399 patent consistently and repeatedly explains that its “segments” are “portions” of an already determined and known “route” (or at least a portion thereof). (*Id.*, 14:5-15; *see also id.*, 5:49-51 (explaining that “the route is divided up into segments”); 14:17-18 (again explaining that “[t]he route may be segmented”); 14:38-39 (likewise explaining that “the ... route (or the ... predicted route) may be divided up into N segments”); 18:33-36 (“every route may be divided into a finite number of segments”); 20:19-25 (discussing “segmenting the route into segments”).

Next, by their very words, both claims 1 and 11 also require an ordered, two-step process (or a system configured to perform such a two-step process). Claim 1 first “determin[es] a segment of a vehicle route.” Then, “calculated electric power” must be “appl[ied]” “to the vehicle to travel along the segment of the vehicle route at a calculated speed.” Similarly, claim 11 requires first “calculat[ing] electric power and speed over a segment of a vehicle route.” Then, the “calculated electric power” must be “appl[ied]” “to the vehicle to travel along the segment of the vehicle route at the calculated speed.” These interrelated claim limitations require that the “segment of a vehicle route” be one that the vehicle has not yet travelled. Relatedly, if the “segment of a vehicle route” were not determined in advance before the vehicle reaches the segment and power is calculated, the claims make no sense. It is not possible to “apply[.]” “calculated electric power to the vehicle *to travel along the*

segment of the vehicle route at a calculated speed” if the vehicle is already traveling over, or has completed traveling over, the route segment. In such circumstances, it is too late to apply the “calculated” power. The time for doing so has already passed. Put another way, the claims require *prospective* speed/power calculations: calculations must be performed for upcoming not yet reached route segments to allow the vehicle “to travel” subsequently over those segments at the calculated speed using the calculated power.

Once again, this is exactly what the ’399 patent discloses. More particularly, the patent’s system uses information about “the next segments (or upcoming segments)” to calculate power and speed. (Ex. 1001, 3:55-4:10; *see also id.*, 5:49-55 (noting that “speeds for current and upcoming route segments can ... be calculated”); *see also* Fig. 2 (showing that power is applied at step 211 after it is calculated for a segment at 209).)

The Petition does not account for any of this. In connection with the ’399 patent’s “segment of a vehicle route” claim element, the Petition points only to Hongo. (*See, e.g.*, Petition at 26-28.) According to the Petition, Hongo purportedly determined a “segment of a vehicle route” because its ACC system stores and then uses “20m” “section[s],” “block[s],” or “BKN” of data “in the driving direction on the road being driven on” when calculating appropriate cruise control speed. (*Id.*)

Hongo is directed to an “automatic cruise control” (“ACC”) system designed to employ the “current position of the vehicle” and “real-time road environment information” when making vehicle speed determinations. (Ex. 1005, [0002], [0008].) In addition to collecting current vehicle position and condition information, Hongo’s system uses two databases of data. The first of these is a “driving history DB 10.” (*Id.*, [0026].) This database “stores driving history ... from when the user drove in the past.” (*Id.*, [0003].) The records in this database are indexed by “BKN” or “block number.” (*Id.*, [0027].) Each indexed block or BKN of data spans 20 meters of positions, and includes various weather, vehicle speed, road curvature, and other data. (*See id.*, [0027]-[0031]; Fig. 3.) Hongo also includes another “driving block DB20” that allows current vehicle position to be converted to a “block number BKN” for purposes of querying the driving history database DB 10. (*Id.*, [0027], [0032].) Hongo explains that the “block[s]” or “BKN” are generated during a so-called “trace mode.” (*See id.*) This “trace mode” is separate from, and not used when, Hongo’s cruise-control is active: “The trace mode is a dedicated mode for constructing the driving history DB 10 consisting of driving history data; while this trace mode is being implemented, the target vehicle speed V0 is not output, and the above mentioned-ACC system is not used.” (*Id.*, [0026].) The accumulated blocks of data stored in the history database also do not even need to be the driver’s own

data. Instead, “driving history DB” can be “made public, shared, or integrated ... with others (or other vehicles).” (*Id.*, [0069]-[0070].)

Hongo’s “blocks” or “BKN” are not what claims 1 and 11 require. First, the “blocks” have nothing at all to do with any “route” being traveled by the vehicle. Hongo does not determine the vehicle’s ultimate destination, any intermediate destinations, or make any other effort to ascertain the “route” along which the vehicle is traveling. Instead, Hongo teaches an ACC system that focuses exclusively on “current” position and “real-time” vehicle conditions. Because Hongo’s system is unaware of the vehicle’s “route,” it follows that Hongo also cannot and does not determine or calculate “a segment of a vehicle route” as required by the ’399 patent. Again, a system cannot determine a “segment of a vehicle route” without first knowing the “route” itself. None of the other prior art discussed by the Petition—which is cited for entirely different purposes—remedy this disclosure deficiency.

Next, Hongo neither determines “segments” nor calculates power/speed needed to travel along a segment because the “block[s]” or “BKN” of data stored by its ACC system are just historical data. They do not relate to not yet traveled route segments. As explained, Hongo’s blocks are generated during a “trace” mode which collects data during past drives. Moreover, the database can include data from other, completely different drivers. Because of this, the “blocks” of driving data stored by Hongo—and used to calculate speed—have no correlation to the actual route the

vehicle is traveling. The blocks could have been saved when the vehicle traveled some other, completely different route in the past. Or, they could relate to a route driven by some other, different vehicle.

Moreover, and more importantly, when Hongo's ACC system determines the vehicle's speed, it considers and employs only the **current** vehicle position and condition. Hongo repeatedly explains that in its ACC system, like all such systems, "speed determinations" are made based on "current position of the vehicle." (*Id.*, [0008]; *see also id.*, [0015] (explaining that Hongo uses the "current position of the vehicle currently driving and the real-time road environment information" to search historical data for purposes of calculating speed).) Put another way, Hongo determines the best speed for the vehicle's **current** position based on speed traveled in the past in similar conditions. But what Hongo does not do is make a **prospective** determination of power needed for the vehicle to travel at speed over a "segment" of a "route" that the vehicle **has not yet reached**. This, however, is what the '399 patent discloses and what its claims require.

Even if one assumed that Hongo's process of identifying a block or BKN stored in its driving history database corresponding to the vehicle's current position somehow constitutes "determining a segment" of route (it does not), claims 1 and 11 would still not be satisfied. In this circumstance, the vehicle would already have passed the beginning of the BKN's position range and would be within the BKN at

the time Hongo's system performs the speed calculation. Thus, Hongo would still not "apply[] calculated electric power to the vehicle to travel along the segment of the vehicle route at a calculated speed" as the vehicle would have already traversed at least part of the "segment." This further shows that, unlike the claims of the '399 patent which require a *prospective* determination, Hongo is concerned only with the vehicle's *current* speed.

Once again, this disclosure deficiency is not remedied by any of the other references in the Petition. The Petition cites Obradovich only for its teaching of voice control. (*See, e.g.*, Petition at 15.) And the Petition cites Niki only for its disclosure of a hybrid vehicle. (*See id.* at 21.) While Niki does make a determination of how its hybrid vehicle's engine and electric motor power should be apportioned to meet vehicle torque demands, this takes into account only the vehicle's current operating state, *i.e.*, the instantaneously required torque. (*See, e.g.*, Ex. 1009, 8:35-63 (torque currently required either by driver input or CC system determined); 9:1-10:23 (currently required torque is distributed between motor and engine following Niki's teachings). Niki—like Hongo—does not calculate the power that should be applied to maintain speed over a not yet traveled route segment.

Petitioner's expert adds nothing to this deficient analysis. Instead, the expert merely repeats the Petition's arguments almost verbatim. (*See, e.g.*, Ex. 1003, ¶¶ 96-98.)

2. “Calculated electric power ... to travel along the segment of the vehicle route at a calculated speed”

For similar reasons, the Petition also failed to show that the prior art “apply[ies] calculated electric power to the vehicle to travel along the segment of the vehicle route at a calculated speed” as both claims 1 and 11 require.

Here, the Petition argues that Hongo’s cruise control itself teaches what these elements require because it is able to “calculate[] speed.” (Petition at 37-38.) According to Petitioner, “controlling vehicle movement using the target vehicle speed itself involves calculating and applying a power corresponding to the target vehicle speed [of] the vehicle engine.” (*Id.* at 39.) This, however, reads an element out of the claims. The claims require both a “calculated speed” and “calculated electric power.” The mere calculation of speed alone is insufficient.

Next, Petitioner points to Niki and argues that it separately teaches “control[ling] the internal combustion-engine E and the motor M so that the vehicle travelling speed VP detected in a vehicle speed sensor S1 becomes the target vehicle speed.” (*Id.* at 39.) But Niki does not “calculate[] electric power” needed to “travel along the segment of the vehicle route at a calculated speed” as claims 1 and 11 require. It only performs *instantaneous* power and speed calculations. (Ex. 1009, 8:35-63; 9:1-10:23.) Moreover, further distancing it from the ’399 patent, rather than considering a prospective route segment when calculating power, Niki’s electric power apportionment determinations are premised on the current state of battery

charge. (*Id.*, 2:20-25 (“state of charge” used to control “lock-up clutch” that determines transmission of motor power to driveshaft); 3:26-54 (similar); 10:18-23 (“state of charge” of the battery is used to “limit power”); 14:50-56 (similar).)

So, all the Petition has done here is point to one reference that calculates the current speed for an active cruise control system (Hongo), and another that determines the relative proportion of power that can be supplied by an electric motor based on the current state of charge (Niki). But, what the Petition has not done is explain why these teachings result in what the claims require: “calculate[ing] electric power” that must be applied to the “vehicle to travel along the segment of the vehicle route at a calculated speed.”

III. CONCLUSION

For the above reasons, Patent Owner respectfully requests that the Board deny institution of *inter partes* review of the '399 patent.

Respectfully submitted,

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CERTIFICATE OF SERVICE

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