Trials@uspto.gov
571-272-7822

Paper 30
Entered: March 10, 2016

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FORD MOTOR COMPANY,
Petitioner,

v.

PAICE LLC & THE ABELL FOUNDATION, INC.,
Patent Owner.

Case IPR2014-01415
Patent 8,214,097 B2

Before SALLY C. MEDLEY, KALYAN K. DESHPANDE, and CARL M. DEFRANCO, *Administrative Patent Judges.*

DEFRANCO, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Paice LLC & The Abell Foundation, Inc. (collectively, "Paice") are the owners of U.S. Patent No. 8,214,097 B2 ("the '097 patent"). Ford Motor Company ("Ford") filed a Petition (Paper 3, "Pet.") for *inter partes* review of the '097 patent, challenging the patentability of claims 1–6, 8–16, 18–26, 28–30, and 34 under 35 U.S.C. § 103. In a preliminary proceeding, we instituted trial because Ford demonstrated a reasonable likelihood that it would prevail in proving unpatentability of the challenged claims. Once trial was instituted, Paice filed a Patent Owner Response (Paper 21, "PO Resp."), and Ford followed with a Reply (Paper 25, "Reply"). The parties waived oral argument here, choosing instead to rely on arguments presented during a prior, consolidated hearing conducted in several related proceedings, namely, IPR2014-00570, -571, -579, -875, -884, and -904.[1] Pursuant to our jurisdiction under 35 U.S.C. § 6(c), we conclude that Ford has proven, by a preponderance of the evidence, that the challenged claims are unpatentable.

II. BACKGROUND

A. Related Cases

The instant Petition challenges a claim of the '097 patent that was adjudicated previously in IPR2014-00570 ("the -570 proceeding"), only on different grounds. Specifically, that prior proceeding led to final written decision that claim 30 is unpatentable under 35 U.S.C. § 103, along with other claims of the '097 patent. 2015 WL 5782083 (PTAB Sept. 28, 2015). We granted institution of trial in the instant proceeding in March 2015, well before our final written decision in the -570 proceeding.

[1] Transcripts have been entered into the record in those earlier proceedings.

The ’097 patent is also the subject of co-pending district court actions, including *Paice, LLC v. Ford Motor Co.*, No. 1:14-cv-00492 (D. Md.), filed Feb. 19, 2014, and *Paice LLC v. Hyundai Motor Co.*, No. 1:12-cv-00499 (D. Md.), filed Feb. 16, 2012. Pet. 1; PO Resp. 4 (referencing the district courts’ claim constructions).

B. The ’097 Patent

The ’097 patent describes a hybrid vehicle with an internal combustion engine, an electric motor, and a battery bank, all controlled by a microprocessor that controls the direction of torque transfer between the engine, the motor, and the drive wheels of the vehicle. Ex. 1101, 16:61–17:5, Fig. 4. The microprocessor monitors the vehicle’s instantaneous torque requirements, also known as “road load (RL),” to determine whether the engine, the electric motor, or both, will be used to propel the vehicle. *Id.* at 11:50–52. Aptly, the ’097 patent describes the vehicle’s various modes of operation in terms of an engine-only mode, an all-electric mode, or a hybrid mode. *Id.* at 35:14–36:4, 36:39–37:22.

As summarized in the ’097 patent, the microprocessor selects the appropriate mode of operation “in response to evaluation of the road load, that is, the vehicle’s instantaneous torque demands and input commands provided by the operator of the vehicle.”[2] *Id.* at 17:16–21. “[T]he microprocessor can effectively determine the road load by monitoring the response of the vehicle to the operator’s command for more power.” *Id.* at 36:57–64. “[T]he torque required to propel the vehicle [i.e., road load]

[2] The ’097 patent contrasts the claimed invention to prior control strategies “based solely on speed,” which are “incapable of responding to the operator’s commands, and will ultimately be unsatisfactory.” Ex. 1101, 13:24–28.

varies as indicated by the operator's commands." *Id*. at 37:23–25. For example, the microprocessor "monitors the rate at which the operator depresses pedals [for acceleration and braking] as well as the degree to which [the pedals] are depressed." *Id*. at 26:59–27:4. These operator input commands are provided to the microprocessor "as an indication that an amount of torque" from the engine "will shortly be required." *Id*. at 27:6–22.

The microprocessor then compares the vehicle's torque requirements against a predefined "setpoint (SP)" and uses the results of the comparison to determine the vehicle's mode of operation. *Id*. at 36:39–37:21, 39:27–59. The microprocessor utilizes a hybrid control strategy that runs the engine only in a range of high fuel efficiency, such as when the torque required to drive the vehicle, or road load (RL), reaches a setpoint (SP) of approximately 30% of the engine's maximum torque output (MTO). *Id*. at 20:37–45, 36:39–59; *see also id*. at 13:48–50 ("the engine is never operated at less than 30% of MTO, and is thus never operated inefficiently").

The microprocessor also limits the rate of increase of the engine's torque output so that combustion of fuel occurs at a substantially stoichiometric air-fuel ratio and utilizes the electric motor to meet any shortfall in torque required to operate the vehicle in response to the operator's command. *See, e.g., id*. at 27:31–35, 29:63–30:12, 37:2–6, 38:62–39:14. Other operating parameters may also play a role in the microprocessor's choice of the vehicle's mode of operation, such as the battery's state of charge and the operator's driving history over time. *Id*. at 19:40–47; *see also id*. at 36:34–38 ("according to one aspect of the invention, the microprocessor 48 controls the vehicle's mode of operation at

any given time in dependence on 'recent history,' as well as on the instantaneous road load and battery charge state"). According to the '097 patent, this microprocessor control strategy maximizes fuel efficiency and reduces pollutant emissions of the hybrid vehicle. *Id*. at 15:38–41.

C. The Challenged Claims

Of the challenged claims, claims 1, 11, 21, and 30 are independent. Claim 1 is illustrative:

> 1. A method for controlling a hybrid vehicle, said vehicle comprising a battery, a controller, wheels, an internal combustion engine and at least one electric motor, wherein both the internal combustion engine and motor are capable of providing torque to the wheels of said vehicle, and wherein said engine has an inherent maximum rate of increase of output torque, said method comprising the steps of:
>
> operating the internal combustion engine of the hybrid vehicle to provide torque to operate the vehicle;
>
> operating said at least one electric motor to provide additional torque when the amount of torque provided by said engine is less than the amount of torque required to operate the vehicle; and
>
> employing said controller to control the engine such that a rate of increase of output torque of the engine is limited to less than said inherent maximum rate of increase of output torque, and wherein said step of controlling the engine such that the rate of increase of output torque of the engine is limited is performed such that combustion of fuel within the engine occurs at a substantially stoichiometric ratio; and comprising the further steps of:
>
> operating said internal combustion engine to provide torque to the hybrid vehicle when the torque required to operate the hybrid vehicle is between a setpoint SP and a maximum torque output (MTO) of the engine, wherein the engine is operable to efficiently produce torque above SP, and wherein SP is substantially less than MTO;

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.