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Paper 13
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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FORD MOTOR COMPANY,
Petitioner,

v.

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

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Case IPR2015-00792
Patent 8,214,097 B2

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

DEFRANCO, *Administrative Patent Judge.*

DECISION TO INSTITUTE
*37 C.F.R. § 42.108*

## I. INTRODUCTION

This is a preliminary proceeding to decide the threshold question of whether *inter partes* review of U.S. Patent No. 8,214,097 B2 ("the '097 patent") should be instituted under 35 U.S.C. § 314(a). Ford Motor Company filed a Petition ("Pet.") seeking *inter partes* review of claims 1, 3, 4, 7, 9, 11, 13, 14, 17, 19, 21, 23, 24, 27, 28, 30, 32, 33, 37, and 38 of the '097 patent, which is owned by Paice LLC & The Abell Foundation, Inc. (collectively, "Paice"). Paice filed a Preliminary Response ("Prelim. Resp.") requesting that we deny institution of *inter partes* review. After considering the Petition and Preliminary Response, we conclude that Ford has demonstrated a reasonable likelihood of proving the challenged claims unpatentable. Accordingly, we institute *inter partes* review of claims 1, 3, 4, 7, 9, 11, 13, 14, 17, 19, 21, 23, 24, 27, 28, 30, 32, 33, 37, and 38.

## II. BACKGROUND

### *A. The '097 patent*[1]

The '097 patent describes a hybrid vehicle with an internal combustion engine, at least one electric motor, and a battery bank, all controlled by a microprocessor that directs the transfer of torque from the engine and/or motor to the drive wheels of the vehicle. Ex. 1201, 17:5–45, Fig. 4. 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 27:2–4. These "operator input commands" are provided to the microprocessor "as an indication that an

[1] The '097 patent is involved in several 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. 2.

amount of torque" from the engine "will shortly be required" to drive the vehicle. *Id*. at 26:59–27:22. The microprocessor then compares this torque requirement to a predefined setpoint and uses the results of the comparison to control the vehicle's mode of operation, e.g., straight-electric, engine-only, or hybrid. *Id*. at 39:27–59. For instance, the microprocessor may utilize a 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, 27:6–12, 36:39–40:56; *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 may also utilize a control strategy that limits the rate of increase of the engine's torque output so that fuel combustion occurs near or at a stoichiometric air-fuel ratio. *Id*. at 38:62–39:14. Operating the engine in accordance with these control strategies maximizes fuel efficiency and reduces pollutant emissions of the vehicle. *Id*. at 15:38–41, 37:2–6, 38:66–39:14.

*B. The challenged claims*

Of the challenged claims, four are independent—claims 1, 11, 21, and 30. Claims 1, 11, and 21 relate to a method for controlling a hybrid vehicle, while claim 30 relates to the hybrid vehicle itself. 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;
>
> operating both the at least one electric motor and the engine to provide torque to the hybrid vehicle when the torque required to operate the hybrid vehicle is more than MTO;
>
> and operating the at least one electric motor to provide torque to the hybrid vehicle when the torque required to operate the hybrid vehicle is less than SP.

Ex. 1201, 56:47–57:15.

Independent claims 11 and 21 are similar in scope to claim 1, except claim 21 uses the term "RL" in place of the phrase "the amount of torque required to operate the vehicle" found in claims 1 and 11. Claim 21 also recites the additional steps of "determining instantaneous road load (RL) required to propel the vehicle" and "operating the engine to charge the battery responsive to the state of charge of the battery." Finally, although claim 30 is directed to the components of a hybrid vehicle, the limitations that pertain to the "controller" are similar in scope to those of method claims 1, 11, and 21.

*C. The asserted grounds of unpatentability*

Ford asserts two grounds of unpatentability against the claims at issue—*first*, claims 1, 7, 9, 11, 17, 19, 21, 27, 28, 30, 37, and 38 are unpatentable as obvious over the combined teachings of Severinsky[2] and Takaoka;[3] and, *second*, claims 3, 4, 13, 14, 23, 24, 32, and 33 are unpatentable as obvious over the teachings of Severinsky, Takaoka, and Yamaguchi.[4] Pet. 5.

## III. ANALYSIS

In this preliminary proceeding, we decide whether Ford has made a threshold showing, supported by sufficient proof, of a reasonable likelihood that the challenged claims are unpatentable for obviousness under 35 U.S.C. § 103. In deciding this question, we construe the claims only to the extent necessary without making a final determination until the parties have exhausted their opportunity to present additional evidence and argument.

*A. Claim construction*

Ford asks that we construe the following terms: "road load," "setpoint," and "ambient and transient conditions." Pet. 13–16. In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b). This standard involves determining the ordinary and customary meaning of the claim terms as would be understood by one of ordinary skill in the art reading the patent's entire written

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[2] U.S. Patent No. 5,343,970, iss. Sept. 6, 1994 (Ex. 1205, "Severinsky").
[3] T. Takaoka et al., *A High-Expansion Ratio Gasoline Engine for the Toyota Hybrid System*, TOYOTA TECHNICAL REVIEW, Vol. 47, No. 2 (April 1998) (Ex. 1206, "Takaoka").
[4] U.S. Patent No. 5,865,263, iss. Feb. 2, 1999 (Ex. 1209, "Yamaguchi").

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