

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 and THE ABELL FOUNDATION, INC.,  
Patent Owner.

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Case IPR2014-01415  
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  
Institution of *Inter Partes* Review  
37 C.F.R. § 42.108

## I. INTRODUCTION

Ford Motor Company (“Ford”) filed a Petition (“Pet.”) for *inter partes* review of U.S. Patent No. 8,214,097 B2 (“the ’097 patent”). Paper 2. The Petition challenges the patentability of claims 1–6, 8–16, 18–26, 28–30, and 34 under 35 U.S.C. § 103. Paice LLC and The Abell Foundation, Inc. (“Paice”), the owner of the ’097 patent, filed a Preliminary Response (“Prelim. Resp.”). Paper 9. After considering the Petition and Preliminary Response, we determine that Ford has demonstrated a “reasonable likelihood” that the challenged claims are unpatentable. 35 U.S.C. § 314. Accordingly, on behalf of the Director, we institute an *inter partes* review of challenged claims 1–6, 8–16, 18–26, 28–30, and 34. 37 C.F.R. § 42.4(a).

## II. BACKGROUND

### A. *The ’097 Patent*<sup>1</sup>

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 directs torque transfer between the engine, the motor, and the drive wheels of the vehicle. Ex. 1101, 16:61–17:5, Fig. 4. The microprocessor compares the vehicle’s torque requirements and the engine’s torque output against a predefined setpoint (SP) 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 36:39–37:21, 39:27–59. The microprocessor

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<sup>1</sup> The ’097 patent is the subject of a co-pending case, *Paice, LLC v. Ford Motor Company*, No. 1:14-cv-492, filed Feb. 19, 2014, in the U.S. District Court for the District of Maryland. Pet. 1.

utilizes a hybrid control strategy that operates the engine only in a range of high fuel efficiency, which occurs when the torque required to drive the vehicle reaches a setpoint equal to at least 30% of the engine's maximum torque output (MTO). *Id.* at 20:37–45; *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 hybrid control strategy also limits the rate of change of the engine's torque output so that combustion is maintained at or near a stoichiometric fuel:air ratio. *Id.* at 38:62–39:14. Preserving stoichiometric combustion throughout the engine's operation improves fuel efficiency and reduces pollutant emissions of the vehicle. *Id.*

*B. 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;

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. 1101, 56:47–57:14.

*C. Asserted Grounds*

Ford challenges the patentability of claims 1–6, 8–16, 18–26, 28–30, and 34 of the '097 patent based on the following grounds of unpatentability.

Pet. 4. Ford also proffers the declaration testimony of Dr. Jeffrey L. Stein in furtherance of these grounds. Ex. 1102.

Ground	Basis	Challenged Claims
§ 103	Severinsky <sup>2</sup> and Anderson <sup>3</sup>	1, 2, 5, 6, 8–12, 15, 16, 18–22, 25, 26, 28, 29

<sup>2</sup> U.S. Patent No. 5,343,970, iss. Sept. 6, 1994 (Ex. 1104).

<sup>3</sup> C. Anderson & E. Pettit, *The Effects of APU Characteristics on the Design of Hybrid Control Strategies for Hybrid Electric Vehicles*, SAE TECHNICAL PAPER 950493 (1995) (Ex. 1105).

Ground	Basis	Challenged Claims
§ 103	Severinsky, Anderson, and Yamaguchi <sup>4</sup>	3, 13, 23
§ 103	Severinsky, Anderson, Yamaguchi, and Takaoka <sup>5</sup>	4, 14, 24
§ 103	Severinsky and Takaoka	30, 34

### III. ANALYSIS

#### A. *Claim Construction*

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in the context of the patent in which they appear. 37 C.F.R. § 42.100(b); accord *In re Cuozzo Speed Techs.*, No. 2014-1301, 2015 WL 448667, at \*6 (Fed. Cir. Feb. 4, 2015) (holding that the PTO “properly adopted” the broadest reasonable interpretation standard for IPR proceedings). Ford proposes a construction for three claim terms, namely, “rate of change,” “setpoint,” and “road load.” Pet. 13–19. Based on our review of the record, however, no particular claim term requires an express construction for purposes of this preliminary proceeding.<sup>6</sup>

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<sup>4</sup> U.S. Patent No. 5,865,263, iss. Feb. 2, 1999 (Ex. 1106).

<sup>5</sup> T. Takaoka et al., *A High-Expansion Ratio Gasoline Engine for the Toyota Hybrid System*, Toyota Technical Review, vol. 47, no. 2 (Apr. 1998) (Ex. 1107).

<sup>6</sup> A “Preliminary Proceeding,” according to our rules, “begins with the filing of a petition for instituting a trial and ends with a written decision as to whether a trial will be instituted.” 37 C.F.R. § 42.2.

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