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Paper 13
Entered: October 26, 2015

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 IPR2015-00722
Patent 7,237,634 B2

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

MEDLEY, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

Petitioner, Ford Motor Company, filed a Petition requesting an *inter partes* review of claims 33, 36, 42–44, 46, 50–52, 55, 78, 161, 173, 215, 228, 233, 235–237, 239, and 240 of U.S. Patent No. 7,237,634 B2 (Ex. 1260, "the '634 patent"). Paper 1 ("Pet."). Patent Owner, Paice LLC & The Abell Foundation, Inc., filed a Preliminary Response in both unredacted

and redacted forms. Papers 10, 11 ("Prelim. Resp.").[1] Patent Owner also filed a Motion to Seal. Paper 12 ("Mot. to Seal."). We have jurisdiction under 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted "unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition."

For the reasons that follow, we institute an *inter partes* review of claims 161, 173, 215, 228, 233, 235–237, 239, and 240 of the '634 patent. We do not institute an *inter partes* review of claims 33, 36, 42–44, 46, 50–52, 55, and 78 of the '634 patent.

A. Related Proceedings

The '634 patent is involved in *Paice LLC v. Ford Motor Co.*, No. 1-14-cv-00492, filed on February 19, 2014, in the United States District Court for the District of Maryland. Pet. 2. Petitioner twice filed an earlier Petition for *inter partes* review of the '634 patent, and we instituted trial in both proceedings. *Ford Motor Co. v. Paice LLC & The Abell Foundation, Inc.*, Case IPR2014-00904 (PTAB Dec. 11, 2014) (Paper 13), and *Ford Motor Co. v. Paice LLC & The Abell Foundation*, Inc., Case IPR2014-01416 (PTAB Mar. 12, 2015) (Paper 9). Petitioner filed eleven additional petitions, including the instant Petition, challenging various claims of the '634 patent.[2]

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[1] Citations are to the redacted version of Patent Owner's Preliminary Response (Paper 11, "Prelim. Resp.").
[2] *See* IPR2015-00606 (Paper 10, Appendix), for a complete listing of the eleven cases.

B. The ’634 Patent (Ex. 1260)

The ’634 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 torque transfer between the engine, the motor, and the drive wheels of the vehicle. Ex. 1260, 17:17–56, Fig. 4. The microprocessor compares the vehicle’s torque requirements and the engine’s torque output against 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 40:16–49. The microprocessor utilizes a hybrid control strategy that operates the engine only in a range of high fuel efficiency, which occurs when the instantaneous 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 20:61–67; *see also id*. at 13:64–65 (“the engine is never operated at less than 30% of MTO, and is thus never operated inefficiently”). Operating the engine in a range above the setpoint but substantially less than the maximum torque output maximizes fuel efficiency and reduces pollutant emissions of the vehicle. *Id*. at 15:55–58.

C. Claims

Petitioner challenges independent claim 33 and dependent claims 36, 42–44, 46, 50–52, 55 and 78, which depend directly or indirectly from claim 33. Petitioner also challenges independent claim 161 and dependent claim 173, which depends directly from claim 161. Petitioner also challenges independent claim 215 and dependent claims 228, 233, 235–237, 239, and 240, which depend directly or indirectly from claim 215.

Claim 33 is illustrative:

> 33. A method for controlling a hybrid vehicle, comprising:
>
> determining instantaneous road load (RL) required to propel the hybrid vehicle responsive to an operator command;
>
> operating at least one electric motor to propel the hybrid vehicle when the RL required to do so is less than a setpoint (SP);
>
> operating an internal combustion engine of the hybrid vehicle to propel the hybrid vehicle when the RL required to do so is between the SP and a maximum torque output (MTO) of the engine, wherein the engine is operable to efficiently produce torque above the SP, and wherein the SP is substantially less than the MTO;
>
> operating both the at least one electric motor and the engine to propel the hybrid vehicle when the torque RL required to do so is more than the MTO; and
>
> monitoring patterns of vehicle operation over time and varying the SP accordingly.

Ex. 1260, 60:58–61:8.

Independent claim 161 is similar in scope except it does not include the "monitoring patterns of vehicle operation over time and varying the SP accordingly" language. Instead, that claim adds changing operation from mode I (electric motor operating) to mode V (both electric motor and engine operating) if received operator input specifies a rapid increase in required torque. *Id.* at 73:42–74:9. Independent claim 215 is similar in scope to claim 33 except it does not include the "monitoring patterns of vehicle operation over time and varying the SP accordingly" language. Instead, that claim adds regeneratively charging a battery of the vehicle when the instantaneous torque output of the engine is greater than RL, when RL is

negative, and/or when braking is initiated by an operator of the vehicle. *Id.* at 79:10–31.

D. Asserted Grounds of Unpatentability

Petitioner contends that claims 33, 36, 42–44, 46, 50–52, 55, 78, 161, 173, 215, 228, 233, 235–237, 239, and 240 of the ’634 patent are unpatentable under 35 U.S.C. § 103 based on the following specific grounds:

Reference[s]	**Basis**	**Challenged Claim(s)**
Ibaraki ’882 [3] and the general knowledge of a person of ordinary skill in the art (“POSA”)	§ 103	33, 36, 43, 44, 46, 50–52, 78, 161, 215, 228, 233, and 235–237
Ibaraki ’882, Ibaraki ’626 [4], and the general knowledge of a POSA	§ 103	55 and 239
Ibaraki ’882, Suga [5], and the general knowledge of a POSA	§ 103	173 and 240
Ibaraki ’882, the general knowledge of a POSA, Masding[6], and Applicant Admitted Prior Art disclosed in ’634 patent (“APA”)	§ 103	42

[3] U.S. Patent No. 5,789,882, issued Aug. 4, 1998 (Ex. 1262) (“Ibaraki ’882”).
[4] U.S. Patent No. 6,003,626, issued Dec. 21, 1999 (Ex. 1263) (“Ibaraki ’626”).
[5] U.S. Patent No. 5,623,104, issued Apr. 22, 1997 (Ex. 1264) (“Suga”).
[6] P.W. Masding et al., *A Microprocessor Controlled Gearbox for Use in Electric and Hybrid-electric Vehicles*, Transactions of the Institute of Measurement and Control, Vol. 10, No. 4 (July–Sept. 1988) (Ex. 1274) (“Masding”).

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