NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

PAICE LLC, THE ABELL FOUNDATION, INC.,
Appellants

v.

FORD MOTOR COMPANY,
Appellee

2017-1263, 2017-1264, 2017-1308, 2017-1309, 2017-1310, 2017-1311

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2015-00722, IPR2015-00784, IPR2015-00787, IPR2015-00790, IPR2015-00791, IPR2015-00800.

PAICE LLC, THE ABELL FOUNDATION, INC.,
Appellants

v.

FORD MOTOR COMPANY,
Appellee

2017-1442, 2017-1443

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2015-00794, IPR2015-00795.

Decided: February 1, 2018

RUFFIN B. CORDELL, Fish & Richardson, PC, Washington, DC, argued for appellants. Also represented by TIMOTHY W. RIFFE, BRIAN JAMES LIVEDALEN, DANIEL TISHMAN.

MATTHEW J. MOORE, Latham & Watkins LLP, Washington, DC, argued for appellee. Also represented by GABRIEL BELL; FRANK A. ANGILERI, JOHN P. RONDINI, ANDREW B. TURNER, Brooks Kushman PC, Southfield, MI.

Before LOURIE, O'MALLEY, and TARANTO, *Circuit Judges*.

Opinion for the court filed by *Circuit Judge* TARANTO.

Opinion dissenting in part filed by *Circuit Judge* O'MALLEY.

TARANTO, *Circuit Judge*.

U.S. Patent Nos. 7,237,634 and 7,104,347, which are owned by Paice LLC and The Abell Foundation (collectively, Paice), describe and claim asserted improvements in a hybrid vehicle—a vehicle that has available for propulsion both a battery-powered electric motor and an internal combustion (gas) engine. At Ford's request, the Patent and Trademark Office instituted inter partes reviews of various claims of the two patents under 35 U.S.C. §§ 311–19. The Patent Trial and Appeal Board

ultimately held numerous claims of the two patents unpatentable. Paice appeals. We affirm.

I

The '634 and '347 patents describe a control strategy, based on the torque needed for propulsion, for switching between different modes of operating a hybrid vehicle—use of (one or more) electric motors, a gas engine, or both. The subject matter has been discussed in previous decisions of this court. *See Paice LLC v. Ford Motor Co.*, 681 F. App'x 885, 887–88 (Fed. Cir. 2017) (*Paice I*) (involving Paice's related U.S. Patent No. 7,559,388); *Paice LLC v. Ford Motor Co.*, 681 F. App'x 904, 908–09 (Fed. Cir. 2017) (*Paice II*) (involving the '347 patent); *Paice LLC v. Ford Motor Co.*, 685 F. App'x 940, 943 (Fed. Cir. 2017) (*Paice III*) (involving Paice's related U.S. Patent No. 8,214,097); *see also Paice LLC v. Ford Motor Co.*, 685 F. App'x 950 (Fed. Cir. 2017) (*Paice IV*) (summary affirmance of Board decisions involving the '634 patent).[1] We recite here only the background necessary to resolve the issues on appeal.

The common specification explains that the control strategy bases selection decisions on instantaneous torque demand, or "road load." '634 patent, col. 13, lines 12–21, 44–65.[2] Because the gas engine runs most efficiently when it produces torque near its maximum torque output,

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[1] Related subject matter is also at issue in appeals 17-1387, 17-1388, 17-1390, 17-1457, 17-1458, and 17-1406, which were argued in tandem with the present appeals.

[2] The '634 patent issued from a divisional application, under 35 U.S.C. § 121, of the application that issued as the '347 patent. Because the patent specifications are identical in all material respects, this opinion cites only to the '634 patent, and to the materials submitted in appeal 17-1263, unless specifically noted otherwise.

the control strategy is designed to operate the engine "only under circumstances where the engine will be loaded so as to require at least 30% of its maximum torque output ('MTO') (it being understood throughout this specification and the appended claims that this 30% figure [setpoint] is arbitrary and can be varied)." *Id.*, col. 13, lines 14–29, 44–65; *see also id.*, col. 2, lines 58–60. Generally, the electric motor alone is used to run the vehicle below the 30% setpoint, the gas engine is used to run the vehicle in the "efficien[t]" range of 30% to 100% of the engine's maximum torque output, and both propulsion sources are used to run the engine when more than 100% of the gas engine's maximum torque output is required (the electric motor providing the additional torque required). *Id.*, col. 41, line 59 through col. 43, line 25 & Fig. 9.

The relevant claims of the Paice patents require two comparisons—of the vehicle's road load to a setpoint, and of the vehicle's road load to the gas engine's maximum torque output—for the decision whether to operate the electric motor, the gas engine, or both. Independent claim 80 of the '634 patent is representative.[3] That claim reads:

> 80. A method for controlling a hybrid vehicle, comprising:
>
> determining instantaneous road load (RL) required to propel the hybrid vehicle responsive to an operator command;
>
> monitoring the RL over time;

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[3] In appeals 17-1442 and 17-1443, the parties treat claims 1 and 23 of the '347 patent as representative. Those claims are materially identical to claim 80 of the '634 patent. *Compare* '634 patent, col. 65, lines 11–33 *with* '347 patent, col. 58, lines 13–37 *and id.*, col. 60, lines 22–54.

> operating the at least one electric motor to propel the hybrid vehicle when the RL required to do so is less than a setpoint (SP);
>
> operating the 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; and
>
> wherein said operating the internal combustion engine to propel the hybrid vehicle is performed when:
>
> the RL>the SP for at least a predetermined time; or
>
> the RL>a second setpoint (SP2), wherein the SP2 is a larger percentage of the MTO than the SP; and
>
> 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.

'634 patent, col. 65, lines 11–33.[4]

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[4] In IPR2015-00791, the Board dismissed the challenge to claim 80 from the inter partes review because that claim had been held unpatentable in an earlier Board decision, *Ford Motor Co. v. Paice LLC*, No. IPR2014-01416, 2016 WL 932948, at *1 (P.T.A.B. Mar. 10, 2016), *aff'd*, *Paice IV*, 685 F. App'x 950. Though not at issue here, claim 80 contains the relevant limitations and is representative of the claims on appeal.

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