

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLKSWAGEN GROUP OF AMERICA, INC.,
Petitioner,

v.

MICHIGAN MOTOR TECHNOLOGIES LLC,
Patent Owner.

IPR2020-00455
Patent 7,116,081 B2

Before NEIL T. POWELL, BARBARA A. PARVIS, and
SCOTT B. HOWARD, *Administrative Patent Judges*.

PARVIS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Volkswagen Group of America, Inc. (“Petitioner”) filed a Petition pursuant to 35 U.S.C. §§ 311–319 requesting an *inter partes* review of claims 1–20 (“challenged claims”) of U.S. Patent No. 7,116,081 B2 (Ex. 1001, “the ’081 Patent”). Paper 2 (“Pet.”). Michigan Motor

Technologies LLC (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”).

We apply the standard set forth in 35 U.S.C. § 314(a), which requires demonstration of “a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”¹ Upon consideration of the parties’ contentions and the evidence of record at this preliminary juncture in the proceeding, we determine that Petitioner has demonstrated that there is a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims of the ’081 Patent.

II. BACKGROUND

A. *Related Matters*

The parties state that the ’081 Patent was asserted in *Michigan Motor Technologies LLC v. Volkswagen AG*, Case No. 2:19-cv-10485 (E.D. Mich.). Pet. 2; Paper 5, 1. The parties further state that the Second Amended Complaint in that matter no longer asserts infringement of the ’081 Patent. Pet. 2; Paper 5, 1.

The parties also identify the following proceedings which were dismissed due to settlement: *Michigan Motor Technologies LLC v. Hyundai Motor Co.*, Case No. 2:17-cv-12901 (E.D. Mich.); *Hyundai Motor Co. v. Michigan Motor Technologies LLC*, IPR2018-01078. Pet. 2; Paper 5, 1.

B. *The ’081 Patent*

The ’081 Patent is directed to thermal protection for high output vehicle alternators. Ex. 1001, 1:6–8, 1:58–63. A thermal protection scheme

¹ We have authority under 35 U.S.C. § 314 to determine whether to institute an *inter partes* review. See 37 C.F.R. § 42.4(a) (2020).

is illustrated in Figure 2 of the '081 Patent, which is reproduced below. *Id.* at 2:37-40.

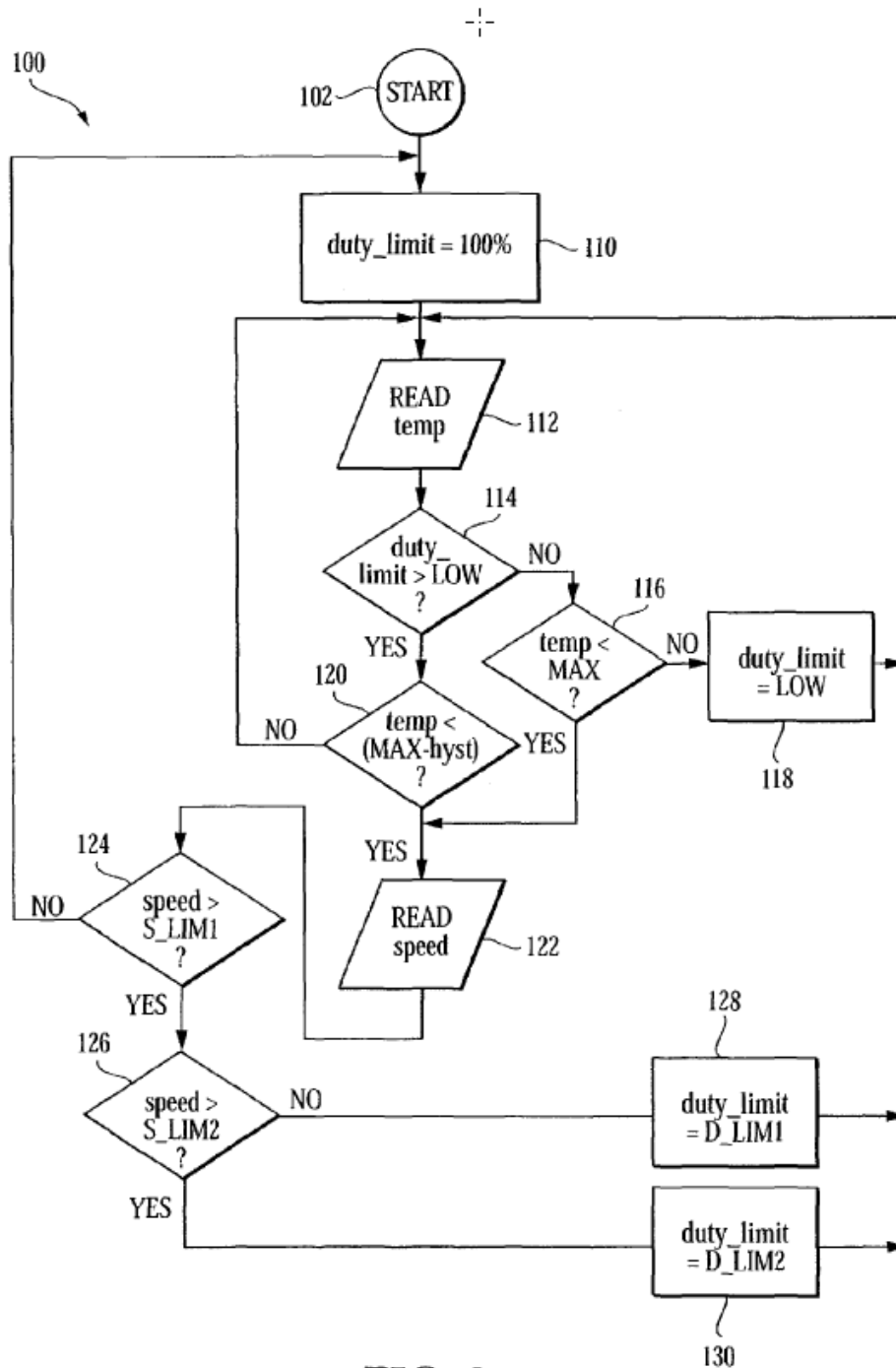


FIG. 2

Figure 2 of the '081 Patent, above, is a flow chart diagram showing steps performed by thermal protection algorithm 100 of a duty cycle control

system. *Id.* at 5:20–23. Algorithm 100, among other things, signals changes to the duty cycle controller to change the duty cycle in response to excess alternator temperature or excess rotor speed. *Id.* at 5:28–31.

Algorithm 100 is initiated at step 102, after a vehicle engine has been turned on. *Id.* at 5:24–25. A duty cycle of 100% begins at step 110 and then a temperature determination for the alternator is made at step 112. *Id.* at 5:32–37. If, at step 116, the temperature determined at step 112 is greater than a maximum temperature limit, the algorithm proceeds to step 118 to set the duty cycle limit and then returns to step 112. *Id.* at 5:62–67. The '081 Patent describes in a “preferred embodiment, using a Lundell type alternator, the maximum temperature limit may be in the range of about 145–155° C., most preferably about 150° C.” *Id.* at 5:58–61.

The '081 Patent describes subsequent steps as follows:

If the temperature 116 is below the maximum determined temperature, an alternator rotor speed 122 is determined. The rotor speed 122 is compared to a first speed limit 124. In a preferred embodiment, a first rotor speed limit may be set to limit generation of excess heat production by the alternator before the alternator temperature exceeds the maximum temperature limit 116.

Id. at 6:1–7.

The '081 Patent further describes if “the rotor speed 122 exceeds the first speed limit 124, the rotor speed 122 is compared to a second rotor speed limit 126.” *Id.* at 6:14–16. In accordance with the '081 Patent “[w]hen the rotor speed 122 is below the second rotor speed limit 126, a first duty cycle limit 128 is set” (*id.* at 6:18–20) and “[i]f the speed 122 exceeds the second rotor speed limit 126, a second duty cycle limit 130 is set” (*id.* at 6:32–33). The '081 Patent describes that “the first duty cycle limit 128 for the field drive duty cycle may be set at about 90%” (*id.* at 6:28–29) and “the second

duty cycle limit 130 for the field drive duty cycle may be set at about 80%”
(*id.* at 6:35–37).

C. Illustrative Claims

Petitioner challenges claims 1–20 of the ’081 Patent. Pet. 1. Claims 1, 10, and 17 are the independent claims. Claims 2–9, 11–16, and 18–20 depend, directly or indirectly, from claim 1 or 10. Independent claim 1, reproduced below, is illustrative of the claimed subject matter.

1. A thermal protection system for a high output vehicle alternator, said system comprising:
 - a duty cycle control system;
 - an alternator having a temperature limit and at least one rotor speed limit, said alternator operably connected to said duty cycle control system;
 - a field current supply to said alternator;
 - an alternator rotor speed sensor in communication with said duty cycle control system for determining an alternator rotor speed; and
 - an alternator temperature sensor in communication with said duty cycle control system, for determining an alternator temperature, wherein said duty cycle control system regulates said field current supply to said alternator based on said alternator rotor speed and said alternator temperature in order to maintain said alternator temperature below said temperature limit and prevent excess heat from being generated.

Ex. 1001, 7:5–22.

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