UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/054,710	10/15/2013	Xu Wang	83392545	1550

36865 7590 04/13/2018

MCCOY RUSSELL LLP
806 S.W. BROADWAY, SUITE 600
PORTLAND, OR 97205

EXAMINER
DIGNAN, MICHAEL L

ART UNIT	PAPER NUMBER
1723	

MAIL DATE	DELIVERY MODE
04/13/2018	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte XU WANG, CHUAN HE,
and XIAOGUANG CHANG

Appeal 2017-007717
Application 14/054,710
Technology Center 1700

Before DONNA M. PRAISS, CHRISTOPHER L. OGDEN, and JULIA HEANEY, *Administrative Patent Judges*.

HEANEY, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

Appellants[2] request review pursuant to 35 U.S.C. § 134(a) of the Examiner's Final Rejection of claims 1, 3–5, 7–13, 21, and 22[3] of

---

[1] This Decision refers to the Specification dated Oct 15, 2013 ("Spec."), the Final Rejection dated July 13, 2016 ("Final Act."), the Appeal Brief dated Jan. 13, 2017 ("Appeal Br."), the Examiner's Answer dated Feb. 22, 2017 ("Ans."), and the Reply Brief dated Apr. 24, 2017 ("Reply Br.").

[2] Ford Global Technologies, LLC is identified as the applicant (hereinafter "Appellants") and the real party in interest. Appeal Br. 3.

[3] Appellants cancelled claims 8–13 and 22 after the Final Rejection, and the Examiner modified the grounds of rejection in the Advisory Action dated

Application 14/054,710. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

BACKGROUND

The subject matter on appeal relates to a system for operating a battery pack of a vehicle, which reduces negative effects of temperature sensor degradation on battery pack operation. Appeal Br. 9. The system senses battery pack temperature based on output from a temperature sensor, estimates battery pack temperature based on a battery pack fan speed, then compares those sensed and estimated temperatures and uses the comparison as a basis for adjustment of battery pack output power. Appeal Br. 9–10. According to Appellants,

> the output of a sensor sensing battery pack fan speed may provide valuable information as to confirming the currently sensed battery pack temperature.
>
> . . . [The estimated and sensed temperatures] may be compared so as to verify that the temperature sensor output accurately reflects the current battery back temperature. If the temperature sensor output does not accurately reflect the current battery pack temperature, actions may be taken to mitigate the effect of the faulty temperature sensor on battery pack operation, such as limiting battery pack output power.

Id. at 10.

Claim 1, the sole independent claim, is reproduced below with paragraphing and indentation added for readability:

Nov. 17, 2016, to reflect cancellation of those claims. *See* Appeal Br. 8. Therefore, the only claims at issue in the appeal are 1, 3–5, 7, and 21. *Id.*

1. A system for operating a battery pack of a vehicle, comprising:

a battery pack including a temperature sensor; and

a controller including non-transitory instructions for

determining a currently sensed battery pack temperature based on output of the temperature sensor,

determining a battery pack fan speed based on output of a sensor sensing fan speed,

determining an estimated battery pack temperature based on the battery pack fan speed and not based on the currently sensed battery pack temperature,

adjusting battery pack output power in response to a comparison of the estimated battery pack temperature and the currently sensed battery pack temperature, and

indicating battery pack degradation in response to the comparison.

Appeal Br. 21, Claims App.

THE REJECTIONS

The Examiner maintains the following rejections on appeal:

1. Claims 1, 3–5, 7, and 21 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of Kato[4] and Hensley.[5] Ans. 2.
2. Claims 1, 3–5, 7, and 21 are alternatively rejected under 35 U.S.C. § 103 as unpatentable over the combination of Kato and Avny.[6] *Id.*

---

[4] Kato et al., US 6,377, 880 B1, Apr. 23, 2012 ("Kato").
[5] Hensley et al., US 2013/0110307, May 2, 2013 ("Hensley").
[6] Avny et al., US 2010/0113216 A1, May 6, 2010 ("Avny").

DISCUSSION

Rejection 1

The Examiner finds that Kato teaches a system for detecting failure of a cooling fan during operation of a battery pack, including determining battery pack temperature based on the output of temperature sensors, and estimating battery pack temperature based on a temperature difference between a coolant (e.g. air from a fan), the sensed battery temperature, and electric power output, and comparing it to an actual temperature change using sensed battery temperature. Ans. 2–3, 5–6 (providing citations to Kato). The Examiner finds that Kato's fan failure detecting system thus senses whether a fan is failing, i.e. "whether it is on or off." Ans. 11. The Examiner further finds that Kato's system adjusts the battery pack output power in response to this comparison if an abnormality is detected and battery pack degradation is indicated via an alarm signal. *Id.* at 6.

The Examiner acknowledges that Kato is silent as to whether estimated battery pack temperature is "not based on the *currently* sensed battery pack temperature," as recited in claim 1, but finds that Hensley teaches estimation of temperature based on a fan control signal rather than direct temperature reading from a temperature sensor. Ans. 3–4 (providing citations to Hensley). The Examiner determines that it would have been obvious to a person of ordinary skill in the art to modify Kato's temperature estimation unit so that it relied only upon fan control signal values instead of temperature sensor data, because Hensley teaches that fan control signal values are a useful way to model temperature in systems where multiple sensors are being used (Ans. 4) and in order to simplify Kato's temperature change calculation or provide redundancy in the system. Ans. 9–10.

Appellants argue that the rejection is deficient for the following reasons: (1) Hensley's estimation of battery pack temperature "*is based on a currently sensed battery pack temperature*" (Appeal Br. 14; Reply Br. 2–5); (2) Kato does not teach "determining a battery pack fan speed based on output of a sensor sensing fan speed," as recited in claim 1 (Appeal Br. 16; Reply Br. 10–11); and (3) the rationale for modifying Kato with Hensley is not supported by evidence (Reply Br. 5–6). We are persuaded by Appellants' argument that Kato does not teach "a sensor sensing fan speed," and therefore find that the rejection is based on harmful error, for the reasons argued by Appellants and further discussed below.

The Examiner determines that the broadest reasonable interpretation of the claim limitation "determining a battery pack fan speed based on output of a sensor sensing fan speed" is at least a sensor which performs a basic "on" or "off" threshold calculation based on any number of inputs. Ans. 12. Based on that claim interpretation, the Examiner finds that Kato's failure determination unit **66** "senses" "whether a fan is working or failing, whether it is on or off." Ans. 11. Appellants dispute the Examiner's claim interpretation (*see* Appeal Br. 16, Reply Br. 10–11), and further argue that even if the Examiner's interpretation is accepted, Kato does not teach the limitation because its failure determination unit **66** does not indicate whether a cooling fan is on or off, but only determines if there is a failure of the cooling fan. Reply Br. 10. For example, Kato would determine a cooling fan was failing if a fan had reduced capacity due to blocking of its inlet or outlet, even though the fan was "on." *Id.* at 10–11. Accordingly, even under the Examiner's proposed claim interpretation, the finding that Kato teaches "a sensor sensing fan speed" lacks evidentiary support.

Rejection 2

Rejection 2 is based on the same erroneous finding concerning Kato as Rejection 1. Accordingly, we also reverse Rejection 2.

SUMMARY

We reverse the rejections of claims 1, 3–5, 7, and 21.

REVERSED