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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHRISTIAN JOHAN, OWEN HANDLEY, and
KEN J. JACKSON

Appeal 2019-004588
Application 15/215,957
Technology Center 3600

Before JOSEPH A. FISCHETTI, PHILIP J. HOFFMANN, and
KENNETH G. SCHOPFER, *Administrative Patent Judges*.

HOFFMANN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–13, 21, 26, and 27. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Ford Global Technologies, LLC. Appeal Br. 2.

According to Appellant, the invention “relates to vehicle systems and methods for controlling electrified vehicles.” Spec. ¶ 1. Claims 1 and 27 are the independent claims on appeal. Below, we reproduce claim 1 as illustrative of the appealed claims:

1. A method, comprising:
 - controlling an electrified vehicle by modifying a power output of an engine to power an electric heating device;
 - generating heat with the electric heating device;
 - increasing a temperature of a battery pack of the electrified vehicle with the heat,wherein the electric heating device is separate from and located external to the battery pack.

REJECTIONS AND PRIOR ART

The Examiner rejects the claims as follows:

- I. Claims 7–10 under 35 U.S.C. § 112(b) as indefinite;
- II. Claims 1–12 and 26 under 35 U.S.C. § 103 as unpatentable over Hettrich et al. (US 2016/0229282 A1, pub. Aug. 11, 2016) (“Hettrich”) and Shiraishi et al. (US 2001/0045194 A1, pub. Nov. 29, 2001) (“Shiraishi”); and
- III. Claims 13, 21, and 27 under 35 U.S.C. § 103 as unpatentable over Hettrich, Shiraishi, and Yamazaki et al. (US 2008/0314663 A1, pub. Dec. 25, 2008) (“Yamazaki”).

ANALYSIS

Rejection I—Indefiniteness rejection

Dependent claims 7 and 8 recite the following:

7. The method as recited in claim 1, comprising continuing to power the electric heating device until a power

limit of the battery pack is equal to or within a *predefined target power limit range*.

8. The method as recited in claim 7, comprising lowering the power output of the engine and deactivating the electric heating device if the power limit of the battery pack is equal to or within *the predefined target power limit range*.

Appeal Br., Claims App. (emphases added). According to the Examiner, claims 7 and 8 are indefinite because

[t]he term ‘range’ in [each of] claims 7 and 8 is a relative term[,] which renders the claim indefinite. The term ‘range’ is not defined by the claim[s], the [S]pecification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The ‘range’ could vary depending on vehicle, application, opinion, etc. such that one would not understand or be reasonabl[y] appraised as to what defines the range.

Final Action 4. According to the Examiner, claims 9 and 10 are indefinite “because they depend on claim . . . 8.” Final Action 4.

Based on our review of the record, we do not sustain the Examiner’s indefiniteness rejection. Appellant persuades us that “the term ‘predefined target power limit range’ is not a relative term or a term of degree. . . . The target power limit range is a predefined value that could easily be set by a person of ordinary skill in the art of electrified vehicle battery packs.”

Appeal Br. 3.

Rejection II—Obviousness rejection of claims 1–12 and 26

As set forth above, independent claim 1 recites the following:

1. A method, comprising:

controlling an electrified vehicle by modifying a power output of an engine to power an electric heating device;

generating heat with the electric heating device;
increasing a temperature of a battery pack of the electrified
vehicle with the heat,

wherein the electric heating device is separate from and
located external to the battery pack.

Appeal Br., Claims App. (emphasis added). The Examiner's obviousness rejection relies on a combination of Hettrich and Shiraishi. For the following reasons, contrary to Appellant's argument, the Examiner adequately supports that it would have been obvious to control an electrified vehicle by modifying a power output of an engine to power an electric heating device that heats a battery pack, as claimed.

We agree with the Examiner that Hettrich discloses "controlling an electrified vehicle [by using a power output of an engine] to power an electric heating device" that heats a battery. Final Action 4 (citing Hettrich ¶ 69 ("The electric heater may be powered by . . . combustion engine **101** through a motor module that converts the power generated by . . . combustion engine **101** to electricity for powering the electric heater.")). However, contrary to the Examiner's determination (Answer 4–5), and consistent with Appellant's argument (Appeal Br. 5), Hettrich does not inherently disclose modifying (e.g., increasing) the power output of the engine to power the electric heating device that heats the battery pack.

Thus, the question is whether the Examiner adequately supports that it would have been obvious to operate Hettrich in such a way that the power output of the engine is modified (e.g., increased) to power an electric heating device. According to the Examiner, the rejection "relie[s] on" "Shiraishi . . . to teach that engine speed is raised to increase power produced by the engine in the case that an additional load is imparted on the engine." Answer 5.

More specifically, the Examiner relies on the disclosure of Shiraishi's paragraph 64. Final Action 5. Based on our review, we agree with the Examiner that this portion of Shiraishi discloses that it is known to increase engine speed to increase engine power output. *See* Shiraishi ¶ 64 (“However, the electric heater employed in this method needs much power, increases load on the vehicle for power generation and, consequently, air quantity is increased and engine speed is raised to increase power generated by the engine.”).

Although we have reviewed Appellant's arguments, we do not agree with Appellant that the Examiner errs because, based on Shiraishi's disclosure, one would not operate Hettrich as the Examiner proposes—i.e., in such a way that the power output of Hettrich's engine is modified (e.g., increased) to power Hettrich's electric heating device that heats Hettrich's battery pack. *See* Appeal Br. 4–7. More specifically, Appellant argues that

Shiraishi discloses that using an electric heater to increase the temperature of a catalytic unit associated with an internal combustion engine is undesirable because the electric heater requires too much power, increases power consumption, and increases costs. . . . Combined with Hettrich's acknowledgement that the heater could be powered by a battery system . . . , a person of ordinary skill in the art would more likely be motivated to power the heater using battery power rather than by modifying a power output of the engine because the latter would require too much power, thereby increasing power consumption and costs.

Id. at 5 (citations to Shiraishi, Hettrich omitted). We are not persuaded at least because the Examiner's rejection does *not* rely on Shiraishi as a reason to modify Hettrich to use the power output of the engine to power the electric heating device that heats the battery pack. Instead, as set forth above, Hettrich *already* discloses using the power output of the engine to

power the electric heating device that heats the battery pack. Thus, given that Hettrich discloses using the power output of the engine to power the electric heating device that heats the battery pack, we agree with the Examiner that it would have been obvious to operate Hettrich in such a way that the power output of the engine is modified (e.g., increased) to power an electric heating device, as is disclosed by Shiraishi. In particular, we agree with the Examiner's rationale for doing so—that increasing the power output of Hettrich's engine would avoid “a poor user experience,” caused by a decrease in “the power provided to other sources” resulting from providing power to Hettrich's electric heating device. Final Action 5.

With respect to Appellant's argument regarding dependent claim 2 (Appeal Br. 7; Reply Br. 4), the Examiner supports adequately (Answer 6) that Shiraishi's paragraphs 32 and 33 disclose that “modifying the power output of the engine includes modifying at least one of a speed output and a torque output of a crankshaft of the engine” (Appeal Br., Claims App.). Thus, Appellant does not persuade us that the Examiner errs.

With respect to dependent claim 3, we agree with the Examiner (Answer 6–7) that the claim recitation “the power output of the engine is modified to power the electric heating device” (Appeal Br., Claims App.) is nonlimiting because it is claimed conditionally. Specifically, according to claim 3, the power output is modified “if a temperature of the battery pack is less than a target temperature and a power limit of the battery pack is less than a target power limit” (Appeal Br., Claims App.)—and thus the power-output-modification recitation would only be reached if a certain condition is met. The prior art need not disclose nonlimiting, conditional claim recitations. *See Ex parte Schulhauser*, Appeal No. 2013-007847 (PTAB

Apr. 28, 2016) (precedential). Therefore, inasmuch as Appellant does not persuade us that claim 3 recites any limiting recitation that is undisclosed by Hettrich and Shiraishi, Appellant does not persuade us of Examiner error.

Regarding each of dependent claims 4 and 5, we agree with the Examiner (Answer 7–8) that each claims’ recitation “the power output of the engine is modified to power the electric heating device” (Appeal Br., Claims App.) is not limiting inasmuch as it is claimed conditionally—i.e., the power output is modified “if an engine coolant temperature is less than a target engine coolant temperature” (claim 4), and “if a brake specific fuel consumption of the engine is different from a target brake specific fuel consumption” (claim 5). Because Appellant does not persuade us that claims 4 and 5 recite any limiting recitation that is undisclosed by Hettrich and Shiraishi, Appellant does not persuade us of Examiner error.

Regarding dependent claims 7, 11, and 26, Appellant does not identify with specificity any error on the Examiner’s part. *See* Appeal Br. 9–10. Instead, Appellant broadly states that no reference discloses certain claim recitations. Thus, Appellant does not persuade us that the Examiner errs.

Therefore, based on the foregoing, we sustain the Examiner’s obviousness rejection of claims 1–12 and 26.

Rejection III—Obviousness rejection of claims 13, 21, and 27

Appellant argues that the obviousness rejection of these claims is in error for the same reasons that the rejection of claim 1 is in error. Appeal Br. 10. Because we sustain claim 1’s rejection, Appellant does not persuade us that the Examiner errs.

Appellant further argues that the rejection of claim 13 is in error because Yamazaki's paragraph 2 "does not specifically describe using excess regen power to augment powering the resistive heater." *Id.* at 11. We are not persuaded of error because Appellant's argument does not persuasively explain, in sufficient detail, why "[t]he proposed modification would result in powering the heater using regenerative braking alone rather than augmenting another power source." Reply Br. 6. Instead, the Examiner's proposed combination includes Hettrich that, as described above, discloses "controlling an electrified vehicle [by using a power output of an engine] to power an electric heating device" that heats a battery. Final Action 4 (citing Hettrich ¶ 69). By way of further explanation, it is unclear to us why modifying Hettrich based on Yamazaki would result in an arrangement that omits Hettrich's disclosed method of heating the battery pack.

Thus, based on the foregoing, we sustain the Examiner's obviousness rejection of claims 13, 21, and 27.

CONCLUSION

We REVERSE the Examiner's indefiniteness rejection of claims 7–10.

WE AFFIRM the Examiner's obviousness rejections of claims 1–13, 21, 26, and 27.

In summary:

Claims Rejected	35 U.S.C. §	Basis/Reference(s)	Affirmed	Reversed
7-10	112(b)	Indefiniteness		7-10
1-12, 26	103	Hettrich, Shiraishi	1-12, 26	
13, 21, 27	103	Hettrich, Shiraishi, Yamazaki	13, 21, 27	
Overall Outcome:			1-13, 21, 26, 27	

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED