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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte WEI LIANG, RAJIT JOHRI, XIAOYONG WANG,
MARK STEVEN YAMAZAKI, MING LANG KUANG,
and JEFFREY ALLEN DOERING

Appeal 2018-000981
Application 14/518,270
Technology Center 3600

Before MICHAEL C. ASTORINO, BRADLEY B. BAYAT, and
ROBERT J. SILVERMAN, *Administrative Patent Judges*.

ASTORINO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), the Appellant¹ appeals from the Examiner's decision rejecting claims 9–13, 16, and 17.² We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM IN PART.

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

² Claims 14, 15, and 21–28 include allowable subject matter. Final Act. 13.

CLAIMED SUBJECT MATTER

Claim 9 is representative of the subject matter on appeal and is reproduced below.

9. A hybrid powertrain control method comprising:
issuing commands for an engine to generate and deliver an estimated torque across a clutch;
issuing a command for an electric machine to output rotational speed based on the estimated torque delivered across the clutch;
measuring actual rotational speed of the electric machine;
providing a feedback loop indicating a discrepancy between the commanded and actual rotational speeds; and
modifying the command for the electric machine to minimize the discrepancy.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Wang et al. (Wang’)	US 8,538,643 B1	Sept. 17, 2013
Joe	US 2007/0080005 A1	Apr. 12, 2007
Klymenko et al. (“Klymenko”)	US 2014/0257617 A1	Sept. 11, 2014
Yagyu et al. (“Yagyu”).	US 2014/0113766 A1	Apr. 24, 2014
Fattic et al. (“Fattic”).	US 5,637,987	June 10, 1997
Suzuki	US 6,342,027 B1	Jan. 29, 2002
Takaoka et al. (“Takaoka”)	US 2001/0044683 A1	Nov. 22, 2001
Gooden et al. (“Gooden”)	US 2009/0020384 A1	Jan. 22, 2009
Nozaki	US 2012/0309587 A1	Dec. 6, 2012

REJECTIONS

Claims 10 and 12 are rejected under 35 U.S.C. § 112(b) as indefinite.

Claim 9 is rejected under 35 U.S.C. § 103 as unpatentable over Wang, Joe, and Klymenko.

Claim 10 is rejected under 35 U.S.C. § 103 as unpatentable over Wang, Joe, Klymenko, and Yagyuu.

Claim 11 is rejected under 35 U.S.C. § 103 as unpatentable over Wang, Joe, Klymenko, and Fattic.

Claim 12 is rejected under 35 U.S.C. § 103 as unpatentable over Wang, Joe, Klymenko, and Suzuki.

Claim 13 is rejected under 35 U.S.C. § 103 as unpatentable over Wang, Joe, Klymenko, and Takaoka.

Claim 16 is rejected under 35 U.S.C. § 103 as unpatentable over Wang, Joe, Klymenko, and Gooden.

Claim 17 is rejected under 35 U.S.C. § 103 as unpatentable over Wang, Joe, Klymenko, and Nozaki.

ANALYSIS

Indefiniteness

Claim 10 recites, “[t]he method of claim 9 further comprising, in response to an imminent vehicle stop, issuing a command for the electric machine.” Appeal Br., Claims App. 1. Claim 12 recites, “[t]he method of claim 9 further comprising, in response to an imminent engine start event, issuing a command for the electric machine.” *Id.*

The Examiner determines that the term “imminent” in claim 10, which describes a vehicle stop, and claim 12, which describes an engine start event, is indefinite because it expresses an undefined time element. *See* Final Act. 3; Ans. 21–22. The Appellant argues that the plain meaning of the term “imminent” is “about to occur” Appeal Br. 6–7 (Exhibit A, *imminent def.*, American Heritage Dictionary). The Appellant contends that

“the limitation in claim 10 should be interpreted as ‘a vehicle stop that is about to occur’ and the limitation in claim 12 should be interpreted as ‘an engine start event that is about to occur.’” *Id.* at 7. The Examiner does not appear to disagree with the Appellant that the plain meaning of the claim term “imminent” is “about to occur.” Ans. 22. Nonetheless, the Examiner maintains the rejection and explains that “[o]ne of ordinary skill would be unable to ascertain any sort of time delineation mark between an event that will occur sometime in the future, and one that is ‘imminent’, as claimed.” *Id.* The Appellant does not offer a response to the Examiner’s explanation in the Reply Brief.

We determine that the Examiner cogently provides sound reasoning why one of ordinary skill in the art would understand that the claim term “imminent” is unclear. *See In re Packard*, 751 F.3d 1307, 1310–13 (Fed. Cir. 2014) (“[A] claim is indefinite when it contains words or phrases whose meaning is unclear,” i.e., “ambiguous, vague, incoherent, opaque, or otherwise unclear in describing and defining the claimed invention.”); *see also Ex parte McAward*, 2017 WL 3669566, at *5 (PTAB Aug. 25, 2017) (precedential) (explaining that the USPTO considers a claim indefinite when it “contains words or phrases whose meaning is unclear”). As discussed above, the Appellant offers a plain language definition of the term “imminent.” However, in this case, the plain language definition does not explain why the term “imminent” is definite. A proper response would have explained why one of ordinary skill in the relevant art would understand the meaning of the term “imminent” as used in the claims and given adequate support for that explanation. Further, although not dispositive, we note that claims fail to provide a time range for that which is “imminent” and the

Specification does not appear to provide a sufficient basis for one of ordinary skill in the art to understand the time range for an “imminent” vehicle stop or engine start event. *See* Spec. ¶¶ 42, 48–50, original claims 2, 4, 10, 12.

Therefore, we sustain the Examiner’s rejection of claims 10 and 12 as indefinite.

Obviousness

Independent claim 9 recites, “issuing a command for an electric machine to output rotational speed based on the estimated torque delivered across the clutch.” Appeal Br., Claims App. 1.

In regards to this recitation, the Examiner finds that Wang — in the particular embodiment being relied upon for the rejection — “does not specifically disclose a rotational speed control signal.” Final Act. 5. However, the Examiner finds that “motor speed control is clearly within the scope of the invention of Wang.” *Id.* (citing Wang, col. 2, ll. 24–29, col. 5, ll. 34–37). The Examiner concludes:

it would have been obvious to a person of ordinary skill to *incorporate* the control of the motor speed within the raw motor torque command 36, with predictable results, with the motivation of absorbing ‘clunks,’ pulsations and vibrations in the driveline during engine start and clutch engagement, and to achieve the proper damping and smoothness during the clutch engagement.

Id. (emphasis added) (citing Wang, col. 1, ll. 27–40).

The Appellant argues that the Examiner’s rejection conflates Wang’s system of reducing oscillations of a vehicle driveline, which includes an electric motor, with commanding a desired rotational speed to an electric

motor. Appeal Br. 3. The Examiner agrees with the Appellant. Ans. 8. In agreeing with the Appellant we understand the Examiner to have withdrawn the reason proffered in the Final Office Action for modifying Wang to incorporate a rotational speed control signal as required by claim 9.

In the Answer, the Examiner appears to offer a different reason why one of ordinary skill in the art would have modified Wang to include a rotational speed control signal. *See* Ans. 7–9. Namely, the Examiner reasons “that controlling the speed of an electric motor instead of the torque is an operational design choice between art recognized equivalents that one of ordinary skill in the art could make, with predictable results, with the motivation of reducing oscillations of a vehicle driveline.” *Id.* at 7–8. The Examiner supports this reasoning by citing to a power equation, i.e., power equals torque times speed (i.e., angular velocity/rotational speed). *Id.* at 8–9.

A so-called “design choice” rationale, such as the Examiner relies upon, has been deemed appropriate where one prior art element or property is proposed to be substituted for another that achieves the same purpose. *See ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1367 (Fed. Cir. 2016) (“The prior art consistently locates the two sensors at issue in the shredder’s feed, and no party disputes that an ordinary artisan would have found this the obvious location for the combination of sensors. The ordinary artisan would then be left with two design choices.”) *Cf. In re Gal*, 980 F.2d 717, 719 (Fed. Cir. 1992) (“The Board held that Gal had simply made an obvious design choice. However, the different structures of Gal and Matsumura achieve different purposes.”). Our reviewing court has cautioned that “[m]erely stating that a particular [limitation] is a design choice does not make it obvious.” *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056,

1069 n.4 (Fed. Cir. 2018) (quoting *Cutsforth, Inc. v. MotivePower, Inc.*, 636 F. App'x 575, 578 (Fed. Cir. 2016) (nonprecedential)).

The Appellant argues the Examiner's design choice rationale does not apply to the present case because torque and rotational speed are not functional equivalents for an electric machine or motor. Reply Br. 2. The Appellant supports this argument by offering the following:

Controlling speed and controlling torque of an electric machine or motor may serve different purposes and are therefore not equivalents. For example, in an electric or hybrid automobile that is starting from a stopped position where a high torque output may be required to overcome the static friction of the road, it may be desirable to control torque in order to increase the torque at high rate. On the other hand, in an electric or hybrid automobile that is moving at high speeds where a low torque output may be required, it may be desirable to control speed as opposed to torque.

Id. The Appellant's argument persuades us that the Examiner failed — on this record — to adequately support the proffered design choice reasoning. *See also In re Chu*, 66 F.3d 292, 298–99 (Fed. Cir. 1995).

Additionally, the Examiner relies on Joe to teach the rotational speed control signal of claim 9. Final Act. 5 (citing Joe ¶ 132). The Examiner determines:

[I]t would have been obvious for a person having ordinary skill in the art to have *included* the motor speed control of Joe into the invention of Wang, with the motivation of reducing torque fluctuations when the engine is started when changing from EV [electric vehicle] mode to HEV [hybrid electric vehicle] mode.

Id. (emphasis added) (citing Wang, col. 1, lines 51–56). The Examiner explains that modifying Wang with Joe's teaching would ensure a proper start of the engine during the transition between the mode change between EV to HEV. *See* Ans. 11–12.

The Appellant argues that the Examiner's reasoning fails because "Wang already includes a system that reduces driveline oscillations." Appeal Br. 4. The Appellant points out that Wang "utilizes torque from a starter motor 92 and torque from the electric motor 88 to increase engine torque 90 during an engine start" and argues that there is no need to incorporate a second method. Reply Br. 3. The Appellant's argument persuades us that the Examiner failed to adequately support the additional reasoning.

The Examiner's additional reasoning would result in two methods of starting an engine. However, the Examiner does not explain on this record why Wang's method, prior to being modified, fails to ensure a proper start. Further, why the proposed second method of starting an engine is not just a redundant method of starting an engine; and, assuming the second method of starting an engine is redundant, why one of ordinary skill in the art would have understood that the redundant method of starting an engine to be beneficial. In view of the foregoing, we determine that the Examiner's additional reasoning fails to be adequately supported.

Further, the Examiner fails to rely on Klymenko, Yagyu, Fattic, Suzuki, Takaoka, Gooden, or Nozaki in any manner which would remedy the deficiency in the Examiner's rejection. Thus, we do not sustain the Examiner's rejections of independent claim 9 and dependent claims 10–13, 16, and 17.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	References/Basis	Affirmed	Reversed
10, 12	112(b)	Indefinite	10, 12	
9	103	Wang, Joe, Klymenko		9
10	103	Wang, Joe, Klymenko, Yagyu		10
11	103	Wang, Joe, Klymenko, Fattic		11
12	103	Wang, Joe, Klymenko, Suzuki		12
13	103	Wang, Joe, Klymenko, Takaoka		13
16	103	Wang, Joe, Klymenko, Gooden		16
17	103	Wang, Joe, Klymenko, Nozaki		17
Overall Outcome			10, 12	9, 11, 13, 16, 17

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

AFFIRMED IN PART