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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KIMBERLEY KING, BIJAL PATEL, VIET QUOC TO,
PHILIP MICHAEL GONZALES, and JOSEPHINE S. LEE

Appeal 2019-003758
Application 15/476,206
Technology Center 3600

Before DANIEL S. SONG, EDWARD A. BROWN, and
BRANDON J. WARNER, *Administrative Patent Judges*.

SONG, *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 21, 23, 25–27, 29, and 33–35. 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(a). Appellant identifies the real party in interest as Ford Global Technologies, LLC. Appeal Br. 2.

CLAIMED SUBJECT MATTER

The claims are directed to a system and method for a vehicle power system. Claim 21, reproduced below, is illustrative of the claimed subject matter (emphasis added):

21. A vehicle power system comprising:
an external 110V power outlet, an inverter, a DC/DC converter, and a traction battery operatively arranged with one another; and
a controller programmed to,
responsive to a command for power at the power outlet and a state of charge of the traction battery exceeding a threshold, command the traction battery to power the DC/DC converter to provide power via the inverter and power outlet, and
alter the threshold based on a stand time or temperature associated with the traction battery.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Chiku et al.	US 3,886,442	May 27, 1975
Vanderslice, Jr. et al.	US 5,362,942	Nov. 8, 1994
Dougherty et al.	US 5,488,283	Jan. 30, 1996
Ikeda et al.	US 5,595,064	Jan. 21, 1997
Pritchard	US 6,087,808	July 11, 2000
Chen	US 6,181,103 B1	Jan. 30, 2001
Nakane et al.	US 6,191,554 B1	Feb. 20, 2001
Khan et al.	US 2006/0151219 A1	July 13, 2006

REJECTIONS

- The Examiner rejects various claims under pre-AIA 35 U.S.C. § 103(a) as follows:
1. Claims 21, 23, 25–27, 29, and 33–35 as unpatentable over Khan in view of Ikeda. Final Act. 2.

2. Claims 21, 23, 27, and 29 as unpatentable over Kahn in view of Ikeda and further in view of Pritchard, Chen, or Nakane. Final Act. 4.

3. Claims 21, 25, 26, and 33–35 as unpatentable over Kahn in view of Ikeda and further in view of Chiku, Vanderslice, or Dougherty. Final Act. 5.

OPINION

Each of the Examiner’s rejections is based on combination of Kahn and Ikeda. The Examiner finds that Khan discloses a vehicle power system and method of operation substantially as claimed, and concludes that it would have been obvious to modify Khan in view of Ikeda such that the controller provides accessory power based on the battery’s state of charge exceeding a threshold value “for the purpose of preventing excessive battery drain via the accessory . . . [and] to retain sufficient capacity to operate the vehicle and/or start an engine of the vehicle at a later time, thus ensuring the vehicle remains operable.” *See, e.g.*, Final Act. 2–3, *citing* Ikeda col. 3, ll. 1–7, col. 17, ll. 28–45. The Appellant does not dispute these findings or this initial conclusion.

The Examiner concedes that Ikeda fails to specifically teach altering the threshold specifically based on battery stand time or temperature as recited in independent claims 21, 27, and 33. Final Act. 3. However, as discussed below, the Examiner finds that it was well-known in the art that stand time or temperature impacts battery capacity and performance, and concludes that it would have been obvious to alter the threshold accordingly. The Appellant disagrees with the Examiner’s conclusion. We specifically address Rejections 2 and 3 *infra*.

Rejection 2: Khan in view of Ikeda and Pritchard, Chen, or Nakane

The Examiner rejects claims 21, 23, 27, and 29 as unpatentable over Kahn in view of Ikeda and further in view of Pritchard, Chen, or Nakane. Final Act. 4. The Examiner specifically relies on these tertiary references as evidence establishing that it was well-known in the art that “a battery capacity decreases with increasing stand time or disuse time.” Final Act. 4–5, *citing* Pritchard col. 1, ll. 54–62; Chen col. 1, ll. 40–47; Nakane col. 2, ll. 38–45. The Appellant does not dispute these findings.

Based on the above findings, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to have increased (i.e., alter) the threshold as stand time or disuse time increases, in view of the knowledge that batteries have “reduced power delivery capacity with increased stand time or disuse time.” Final Act. 4–5.

The Appellant disputes the Examiner’s conclusion, arguing that a *prima facie* case of obviousness has not been shown because “although the art teaches state of charge thresholds, it does not teach that such thresholds should be altered as a function of battery stand time.” Appeal Br. 3; Reply Br. 2 (the Examiner “cannot find art that discloses altering the claimed threshold based on a stand time.”). According to the Appellant, the Examiner’s conclusion is based on impermissible hindsight. Appeal Br. 3.

The Examiner responds that, in addition to the uncontested evidence establishing that it was well-known to a person of ordinary skill in the art that battery capacity decreases with increasing stand time, “the ordinary practitioner in the electric and/or hybrid vehicle arts is possessed of substantial skill,” has ordinary creativity, and is not an automaton, such that the claimed invention would have been obvious. Ans. 6, 8. We agree with the Examiner. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (“A

person of ordinary skill is also a person of ordinary creativity, not an automaton.”).

Given the knowledge, skill, and creativity of those of ordinary skill, we agree with the Examiner that it would have been obvious and within the skill of one of ordinary skill in the art to have implemented the controller to alter the threshold based on increasing stand time. In that regard, we observe that the initial threshold would have been initially determined and selected by one of ordinary skill based on operating characteristics of the vehicle and capacity of its traction battery. As noted above, the cited tertiary references establish that battery capacity is reduced with increasing stand time, and thus, “provide evidence that these characteristics of battery function would be well identified as needing consideration for fully successful vehicle operation.” Ans. 6. As the Examiner further explains, a person of ordinary skill in the art would have “recognize[d] that a vehicular arrangement or operating method as described by Kahn et al. and Ikeda et al. does not accommodate for the change in a battery’s operating characteristics based on a stand or disuse time . . . which are demonstrated-known characteristics of batteries.” Ans. 8–9. Therefore, upon appreciating that the battery’s capacity characteristics upon which the threshold was initially selected changes as the battery stand time increases such that the threshold would not be accurate, a person of ordinary skill and creativity would have found it obvious to alter the threshold based on such stand time to make the vehicle power system more accurate by accounting for such changes in the battery’s capacity characteristics over time.

Although the Appellant focuses on an assertion that no prior art reference has been relied on by the Examiner that explicitly alters the threshold, the Examiner is correct that “there is no requirement that the prior

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art of record explicitly teach a combination,” and that motivation to modify a reference may be “implicit in the knowledge of one of ordinary skill in the art.” Ans. 5–6. *KSR*, 550 U.S. at 418–19 (“the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim” and “obviousness analysis cannot be confined . . . by overemphasis on the importance of published articles and the explicit content of issued patents”); *see also In re Kahn*, 441 F.3d 977, 987–88 (Fed. Cir. 2006) (teaching, motivation, or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references); *Dystar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006) (implicit motivation to combine exists when the improvement is technology-independent and the combination of references results in a product that is more desirable, for example, because it is stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient).

The Appellant further argues that there lacks “recognition in the art of record” that “the state of charge threshold of Ikeda, for example, may not work as intended given the changes in battery capacity that occur with increased stand time.” Appeal Br. 3. According to the Appellant, “nothing in the art suggests that those of ordinary skill had recognized such problem/solution related to thresholds and battery capacities.” Reply Br. 2; *see also* Appeal Br. 3 (the rejection “depends on a key presumption regarding recognition of a problem for which the examiner offers nothing more than unsupported implicit argument”).

However, this line of argument is unpersuasive because, regardless of whether the threshold of Ikeda would work as intended or not, we agree with the Examiner that it would have been obvious to one of ordinary skill in the

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art to improve the accuracy of the vehicle power system by accounting for the fact that a battery capacity is reduced with increasing stand time as established by the art of record. Optimization and enhancing accuracy of the operation of a system is not limited to making the system merely functional.

The Appellant further argues that if it was well known that battery capacity decreases with increasing standing time, “why are there absolutely no references that suggest altering a state of charge threshold based on stand time?” Appeal Br. 3. Notwithstanding the fact that the Appellant cannot state with certainty that there are “absolutely no references” in the art, the Appellant is again requiring explicit disclosure in a prior art reference rather than considering the art of record in view of the knowledge, skill, and creativity of those of ordinary skill in the art.

Therefore, in view of the above, we affirm the Examiner’s rejection of independent claims 21 and 27. The Appellant relies on dependency on an independent claim for patentability of the remaining dependent claims. Appeal Br. 4. Accordingly, the rejection of dependent claims 23 and 29 is affirmed as well.

Rejection 3: Khan in view of Ikeda and Chiku, Vanderslice, or Dougherty

The Examiner rejects claims 21, 25, 26, and 33–35 as unpatentable over Kahn in view of Ikeda and further in view of Chiku, Vanderslice, or Dougherty, the Examiner relying on these tertiary references as evidence establishing that it was well-known in the art that “battery capacity increases with increasing temperature.” Final Act. 5, *citing* Chiku Fig. 7, col. 10, ll. 27–53; Vanderslice Fig. 6, col. 3, ll. 6–8; Dougherty col. 2, ll. 5–6. The Appellant does not dispute these findings of the Examiner.

Based on the above findings, the Examiner similarly concludes that it would have been obvious to one of ordinary skill in the art to have reduced (i.e., alter) the threshold as temperature increases, in view of the knowledge that batteries have “a greater power delivery capacity with increased temperature.” Final Act. 5–6.

The Appellant disputes this conclusion relying on substantively the same arguments addressed above relative to Rejection 2, stating that “[t]he above arguments are applicable to all the examiner rejections and art of record, including those directed to claims 21 and 33 concerning changes in temperature rather than changes in stand time.” Appeal Br. 4.

Therefore, having found the Appellant’s arguments unpersuasive as to Rejection 2, we likewise affirm Rejection 3.

Rejection 1: Khan in view of Ikeda

The Examiner rejects claims 21, 23, 25–27, 29, and 33–35 as unpatentable over Khan in view of Ikeda. Final Act. 2. However, Rejections 2 and 3 addressed above affirm a rejection of each of these claims based on Khan and Ikeda in view of other tertiary references. Accordingly, we need not reach this rejection.

CONCLUSION

The Examiner’s rejection of claims 21, 23, 25–27, 29, and 33–35 is affirmed. More specifically,

1. Rejection of claims 21, 23, 25–27, 29, and 33–35 as unpatentable over Khan in view of Ikeda is not reached.

2. Rejection of claims 21, 23, 27, and 29 as unpatentable over Kahn in view of Ikeda and further in view of Pritchard, Chen, or Nakane is affirmed.

3. Rejection of claims 21, 25, 26, and 33–35 as unpatentable over Kahn in view of Ikeda and further in view of Chiku, Vanderslice, or Dougherty is affirmed.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
21, 23, 25–27, 29, 33–35	103(a) ²	Khan, Ikeda		
21, 23, 27, 29	103(a)	Kahn, Ikeda, Pritchard, Chen, Nakane	21, 23, 27, 29	
21, 25, 26, 33–35	103(a)	Kahn, Ikeda, Chiku, Vanderslice, Dougherty	21, 25, 26, 33–35	
Overall Outcome			21, 23, 25–27, 29, 33–35	

² The rejection of claims 21, 23, 25–27, 29, and 33–35 as unpatentable over Kahn and Ikeda is duplicative and is not reached here, as alternate rejections of each of these claims (relying on the same base combination) have been affirmed.

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TIME PERIOD FOR RESPONSE

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