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MACMILLAN, SOBANSKI & TODD, LLC - FORD
ONE MARITIME PLAZA - FIFTH FLOOR
720 WATER STREET
TOLEDO, OH 43604

EXAMINER	
RUSSELL, DEVON L	

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TIMOTHY N. BLATCHLEY,
KENNETH J. JACKSON, and ANGEL F. PORRAS

Appeal 2019-001755
Application 14/863,543
Technology Center 3700

Before PHILLIP J. KAUFFMAN, JEREMY M. PLENZLER, and ALYSSA A. FINAMORE, *Administrative Patent Judges*.

KAUFFMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1, 3–9, and 11–13. Final Act. 2–8. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

CLAIMED SUBJECT MATTER

Appellant's claimed invention relates to a liquid-cooled battery for an electrified vehicle with active and passive cooling modes. Spec. 1:13–15. Claims 1 and 11 are independent. Claim 1, reproduced below, is illustrative of the claimed subject matter:

> 1. An electrified vehicle comprising:
>
> an electric drive adapted to selectably move the vehicle;
>
> a battery pack providing electrical energy to the electric drive, wherein the battery pack includes a cooling conduit for conveying a liquid coolant;
>
> battery sensors sensing a battery temperature and a battery coolant temperature;
>
> a passive radiator exposed to an ambient air temperature;
>
> a liquid pump for pumping the coolant through the cooling conduit;
>
> a shared cooling subsystem including a compressor and a condenser circulating a refrigerant;
>
> a main evaporator selectably coupled to the shared cooling subsystem and adapted to evaporate refrigerant to cool a passenger cabin of the vehicle;

[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. 1.

> a chiller selectably coupled to the shared cooling subsystem and adapted to evaporate refrigerant to cool the coolant;
>
> an expansion valve coupled to the chiller controlling flow of refrigerant to the chiller to selectably evaporate refrigerant to cool the coolant;
>
> a diverting valve with a first configuration connecting the radiator with the pump and cooling conduit bypassing the chiller and a second configuration connecting the chiller with the pump and cooling conduit bypassing the radiator; and
>
> a controller providing commands to the valve for selecting one of the configurations, wherein when the battery temperature is between a first threshold temperature and a predetermined power-limiting temperature then commanding the first configuration provided that a difference between the battery coolant temperature and the ambient temperature is greater than a predetermined difference and otherwise commanding the second configuration, and wherein when the battery temperature is greater than the power-limiting temperature then commanding the second configuration.

REJECTIONS

I. Claims 1, 3–5, and 11[2] are rejected under 35 U.S.C. § 103 as unpatentable over Simonini, Dogariu, and Labaste Mauhe.[3] Final Act. 2–7.

II. Claims 6–9, 12, and 13 are rejected under 35 U.S.C. § 103 as unpatentable over Simonini, Dogariu, Labaste Mauhe, and Scherer.[4] Final Act. 7–8.

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[2] Although the Examiner lists claim 10 as being rejected on this basis (Final Act. 2), claim 10 is cancelled and not at issue in this Appeal.
[3] Simonini (US 8,932,743 B2; issued Jan. 13, 2015); Dogariu (US 8,448,460 B2, issued May 28, 2013); Labaste Mauhe (US 2014/0374060 A1, published Dec. 25, 2014).
[4] Scherer (US 6,655,163 B1, issued Dec. 2, 2003).

ANALYSIS

Simonini describes vehicle 10 having a rechargeable energy storage system (“RESS”). Simonini 2:6–8, 26–29, Fig. 1. The vehicle also has coolant loop 16, which includes four port variable coolant routing valve 48 for selectively directing cooling fluid through three different branches. Simonini 2:63–66, Fig. 1. One branch directs the cooling fluid through radiator 52, in which the fluid undergoes passive cooling. Simonini 2:66–67. Another branch directs the cooling fluid through chiller 38, in which the fluid undergoes active cooling. Simonini 3:5–6.

During operation of vehicle 10, valve 48 enables active cooling of the cooling fluid when an RESS temperature (such as a battery cell temperature) exceeds a highest recommended temperature. When the RESS temperature is below the highest recommended temperature, valve 48 enables either active or passive cooling, depending on the availability of passive cooling. Simonini 5:14–20, 24–30, 44–47, Fig. 6. Figure 6 indicates that highest recommended temperature 438 is related to upper endpoint 432 of the optimal temperature range for the RESS. Simonini 5:7–9, 14–20.

The Examiner finds that Simonini’s highest recommended temperature, which is related to the upper endpoint of the optimal temperature range for the RESS, corresponds to, or at least suggests, the power-limiting temperature recited in claim 1. Final Act. 3–4. The Examiner explains that “the highest recommended temperature may mean the temperature above which all use of the battery should cease and is therefore, inherently, a power limiting temperature.” Final Act. 3–4. Seizing on this latter statement, Appellant argues that the Examiner’s finding is erroneous. Appeal Br. 4 (citing Spec. 7:13–23); Reply Br. 1–2.

The Examiner alternatively finds, however, that exceeding the upper endpoint of the optimal temperature range for the RESS inherently would lead to suboptimal operation. Final Act. 4. As such, either the upper endpoint of the optimal temperature range for the RESS, or the related highest recommended temperature, would correspond to the power-limiting temperature recited in claim 1. This is true even if one defines "power-limiting temperature" in a manner consistent with the teachings of page 7 of the Specification. Ans. 4–5. Nothing in Appellant's response persuades us that this finding is incorrect. Indeed, Appellant does not address this alternative finding.

Dogariu describes a cooling system for battery pack 22 onboard an electric or hybrid vehicle. Dogariu 2:7–9. The cooling system includes chiller bypass valve 64 and controller 68 for directing cooling fluid either to chiller 30 or to radiator 92. Dogariu 4:62–5:8, 5:9–11, 15–19, 25–35, Fig. 1. If controller 68 determines that the temperature of battery pack 22 exceeds an upper temperature threshold, the controller subtracts the ambient temperature from the temperature of the battery pack. If this difference exceeds a predetermined temperature differential, controller 68 causes valve 64 to direct the cooling fluid to radiator 92 for passive cooling. If the difference does not exceed the predetermined temperature differential, controller 68 determines that passive cooling is not available and directs the cooling fluid to chiller 30 for active cooling. Dogariu 6:27–48, Fig. 2.

Appellant argues that, since Simonini and Dogariu both use only one temperature threshold to determine whether to use active or passive cooling, the claimed electrified vehicle, which uses two thresholds, cannot have been obvious. Appeal Br. 4–5.

Appellant's argument is unpersuasive in that it both does not address the rejection as articulated by the Examiner, and is an individual attack on the references. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (citing *In re Keller*, 642 F.2d 413, 425 (CCPA 1981)) (One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.). As discussed above, Simonini teaches enabling active cooling when a battery cell temperature exceeds a highest recommended temperature, which corresponds to the recited power-limiting temperature. When the battery cell temperature is below the highest recommended temperature, Simonini teaches enabling either active or passive cooling, depending on the availability of passive cooling. Simonini 5:14–20, 24–30, 44–47, Fig. 6. Dogariu provides a criterion, implemented when the battery pack temperature exceeds a temperature threshold, for determining whether passive cooling is available. Dogariu 6:27–38, Fig. 2. A natural result of using Dogariu's teachings to determine when passive cooling was available in Simonini's system would have been to import Dogariu's upper temperature threshold, which would have introduced a second temperature threshold, in addition to the highest recommended temperature, into Simonini's cooling system. Thus, Simonini and Dogariu, in combination, teach the two temperature thresholds recited in claim 1. Ans. 5–6.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1, 3–5, and 11	35 U.S.C. § 103	1, 3–5, and 11	
6–9, 12, and 13	35 U.S.C. § 103	6–9, 12, and 13	
Overall Outcome		1, 3–9, and 11–13	

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). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED