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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SHANGUANG XU and BRENT A. MCDONALD

Appeal 2019-005629
Application 15/204,631
Technology Center 2800

Before ROMULO H. DELMENDO, KAREN M. HASTINGS, and
LILAN REN, *Administrative Patent Judges*.

REN, *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 1–3 and 5–20. *See* Final Act. 2. 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 “Texas Instruments Incorporated, a corporation of the State of Delaware.” Appeal Br. 2.

CLAIMED SUBJECT MATTER

“This disclosure relates to a control circuit to improve efficiency of a synchronous rectifier output circuit based on load conditions.” Spec. ¶ 4.

Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A semiconductor device comprising:
a synchronous rectifier (SR) circuit having a first transistor switch device and a second transistor switch device configured to rectify an alternating current (AC) voltage and deliver a load current; and
a controller coupled to the SR circuit, the controller configured to generate a control phase sequence when the load current is equal to or below the predetermined current threshold, the control phase sequence configured to turn on only one of the first or second transistor switch device when the AC voltage is non-zero, and the control phase sequence configured to turn off the first and second transistor switch devices when the AC voltage is substantially zero.

Claims Appendix (Appeal Br. 10).

REFERENCES

The prior art references relied upon by the Examiner are:

Name	Reference	Date
Zheng	US 2015/0194900 A1	Jul. 9, 2015
Boylan	US 2003/0067794 A1	Apr. 10, 2003

REJECTION

Claims 1–3 and 5–20 are rejected under 35 U.S.C. § 103 as unpatentable over Zheng and Boylan. Final Act. 2.

OPINION

In rejecting claim 1², the Examiner finds that Zheng teaches a synchronous rectifier circuit in which “when the secondary side output voltage of the main transformer T1 is high level, Q1 turns on and Q2 turns off” whereas Boylan teaches turning off both synchronous rectifier switches when the inductor current is zero. Zheng ¶ 23 (cited in Final Act. 3); Final Act. 4 (citing Boylan ¶ 58, Figs 6, 7). Citing Boylan’s teaching “to provide a control scheme for a synchronous rectifier converter that prevents substantial reverse current flow in all modes of operation without disabling the synchronous rectifiers,” the Examiner determines that a skilled artisan would have combined Zheng and Boylan to arrive at the apparatus recited in claim 1. Final Act. 4 (citing Boylan ¶ 20).

Appellant argues that the Examiner reversibly erred because neither Zheng nor Boylan “discern[s] the trade-offs in power-efficiency as recognized by the Instant Application.” Appeal Br. 4, 5 (arguing that “[l]ike *Zheng, Boylan* does not discern the trade-off between preventing reverse current and maintaining efficiency of the power converter”).

This argument is not persuasive.

In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. . . . [A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

KSR Int’l Co. v. Teleflex Inc., 550 U.S. 398, 419–20 (2007).

² Appellant does not separately argue for the rejection of claims 2, 3, and 5–20. See Appeal Br. 4–9. These claims stand or fall together. See *id.*; see also 37 C.F.R. § 41.37(c)(1)(iv).

Appellant next argues that the AC voltage in Boylan “is not always in phase with the inductor current” and the Examiner’s finding that both switches are turned off when the inductor current is zero “does not guarantee the AC voltage V_R to be zero as well.” Appeal Br. 5.

This argument is not persuasive because it does not address the Examiner’s finding that Figures 6 and 7 of Boylan show both switches are off when there is no voltage between time period T2 and T3. *Compare* Appeal Br. 5, *with* Final Act. 4, 16 (citing Boylan ¶ 58, Figs 6, 7). To prevail in an appeal to this Board, Appellant must adequately explain or identify reversible error in the Examiner’s §103(a) rejections. *See* 37 C.F.R. § 41.37(c)(1) (iv); *see also In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011).

Appellant’s argument that “[t]he Examiner provided zero evidence or well-reason [sic.] articulation that the proposed modification could provide any actual benefit” is unpersuasive. Appeal Br. 8. Appellant does not address the Examiner’s rationale in support of the rejection, *compare id.*, *with* Final Act. 4 (citing Boylan ¶ 20 in support of the rationale), and no error has been identified. Appellant’s argument that there is no reasonable expectation of success (Appeal Br. 8) is likewise unpersuasive because it is unelaborated and does not address the Examiner’s rationale in support of the rejection.

CONCLUSION

The Examiner’s rejection is affirmed.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–3, 5–20	103	Zheng, Boylan	1–3, 5–20	

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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