THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GREGORY A. BLUM and GEDALY LEVIN

Appeal No. 1997-0058
Application No. 08/300,399

ON BRIEF

Before THOMAS, JERRY SMITH, and GROSS, Administrative Patent Judges.

GROSS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1, 2, 5, 6, 8, 11 through 13, 16, and 17. Claims 3, 4, 7, 9, 10, 14, and 15 stand objected to as being dependent from a rejected base claim.

Appellants' invention relates to a circuit that reduces in a current sense signal the leading edge current spike that

occurs during switching. In particular, the circuit imposes a maximum on the slew rate (or slope) of the current sense signal. Claim 1 is illustrative of the claimed invention and reads as follows:

1. A circuit comprising:

an amplifier having a controlled maximum slew rate, connected for receiving a current sense signal including a meaningful portion proportional to a current in a switched power device and a current spike portion and for generating an output, the maximum slew rate of said amplifier being set so as to attenuate the current spike portion without attenuating the meaningful portion of the current sense signal; and

a switching regulator controller connected to receive the output of said amplifier and to control the switched power device.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

White	4,928,220	May 22, 1990
Kusano	5,192,884	Mar. 09, 1993
Sasaki et al. (Sasaki)	5,382,838	Jan. 17, 1995
		(filed Mar. 18, 1993)

Claims 1 and 6 stand rejected under 35 U.S.C. § 102(b) as being unpatentable over White.

Claims 2, 5, 13, 16, and 17 stand rejected under 35 U.S.C.

§ 103 as being unpatentable over White in view of Kusano.

Claims 8, 11, and 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over White in view of Sasaki.

Reference is made to the Examiner's Answer (Paper No. 12, mailed June 11, 1996) and the Supplemental Examiner's Answer (Paper No. 16, mailed December 26, 1996) for the examiner's complete reasoning in support of the rejections, and to appellants' Brief (Paper No. 11, filed April 15, 1996) and Reply Brief (Paper No. 14½, filed October 15, 1996) for appellants' arguments thereagainst.

OPINION

We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellants and the examiner. As a consequence of our review, we will reverse the anticipation rejection of claims 1 and 6 and also the obviousness rejections of claims 2, 5, 8, 11 through 13, 16, and 17.

Claim 1 requires "an amplifier." The examiner asserts (Answer, page 4) that White's elements 15, 44, 40, and 41 form a gain stage having a controlled slew rate. The examiner later argues (Answer, page 8) that the amplifier is elements

"44 (transistor 45, RC 51, 50) and filter 40, 41. The transistor 45 exhibits the function of an amplifier as do all transistors .... Thus, the limitation of 'an amplifier' is seen as 44, 40 and 41." We disagree. As pointed out by appellants (Brief, page 11), White's transistor 45 is being used as a switch with no amplification function. Therefore, White does not disclose an amplifier, as claimed. Consequently, we cannot sustain the rejection of claim 1.

Claim 6 does not require an amplifier, but rather recites in pertinent part a step of "applying a maximum slew rate limit to the sense signal to produce a ... signal having a slew rate that is prevented from exceeding the maximum slew rate limit." As slew rate is defined as slope (see pages 581-2 of Analog Filter Design by M.E. Van Valkenberg, submitted by appellants with the Brief as Exhibit A), the method of claim 6 limits the slope of the current sense signal to below a maximum. Further, in light of the disclosure, we interpret the claimed maximum slew rate as a slope less than that of a current spike.

The examiner states (Answer, pages 3-4) that White's Figure 2 shows limiting the slew rate. In Figure 2 the

portion of the current spike above the meaningful part of the curve is eliminated, such that the slew rate or slope of that portion becomes low. However, the portion of the current spike below the meaningful part of the sense signal curve of Figure 2 remains unchanged with the same high slope as the original current spike. Thus, White does not prevent the slope of the current sense signal from exceeding a maximum slew rate, since a portion of the signal remains at a high slew rate. Accordingly, White fails to meet every limitation of the claim, and we cannot sustain the anticipation rejection of claim 6.

For claims 2, 5, 13, 16, and 17, the examiner attempts (Answer, page 4) to combine Kusano with White. The examiner states (Answer, page 5) that it would have been obvious to replace White's filter with the transconductance amplifier in Kusano's Figure 2 "because active filters that utilize a feedback technique are preferred when fabricating integrated circuits because of the difficulty in constructing inductance elements."

As asserted by appellants (Brief, page 12), there is no teaching or suggestion in the art to combine White and Kusano

as proposed by the examiner. Since White does not include an inductance between the current sense signal and the pulse width modulator, White has no difficulty in constructing an inductance element. Therefore, there would be no need to substitute an active filter with a feedback technique. Accordingly, we find no reason to combine Kusano with White. Consequently, Kusano fails to cure the deficiencies of White regarding claims 1 and 6. Since claims 2 and 5 depend from claim 1, and therefore include the limitation of claim 1 found lacking from White, we cannot sustain the rejection of claims 2 and 5. Further, claims 13, 16, and 17 require that the slew rate of the modified sense signal be limited to a predetermined maximum when it otherwise would exceed the maximum. Thus, claims 13, 16, and 17 include a limitation similar to the one of claim 6 found lacking from White, and, therefore, are not met by White for the same reasons as discussed above regarding claim 6. Hence, we cannot sustain the rejection of claims 13, 16, and 17.

Regarding claims 8, 11, and 12, the examiner combines Sasaki with White stating (Answer, page 6) that it would have been obvious "to replace the RC slew rate limiting circuit of

White with the active transconductance amplifier slew rate limiting circuit of Sasaki et al. to obtain a more precise output waveshape as clearly suggested in column 1 of Sasaki et al." Claims 8, 11, and 12 all require a gain stage, or amplifier, and as discussed above, White does not disclose an amplifier. Sasaki states (column 1, lines 43-45) that "[w]ith slew-rate control, ECL drivers offer good timing margins, good signal integrity, and introduce little noise." However, as explained by appellants (Brief, page 17), "there is absolutely no suggestion that the digital driver circuit of Sasaki et al. be interchanged with components of the power supply circuit of White." In other words, the examiner has failed to provide a proper motivation to combine the references. Therefore, Sasaki does not cure the deficiencies of White, and we will not sustain the rejection of claims 8, 11, and 12.

CONCLUSION

The decision of the examiner rejecting claims 1 and 6 under 35 U.S.C. § 102(b) is reversed. The decision of the examiner rejecting claims 2, 5, 8, 11 through 13, 16, and 17 under 35 U.S.C. § 103 is reversed.

REVERSED

JAMES D. THOMAS Administrative Patent Judge	)	
JERRY SMITH Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
ANITA PELLMAN GROSS Administrative Patent Judge	)	

ag/rk

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