

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

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Paper No. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte JAMES C. BACH,  
JOHN J. BAKER, ROBERT J. STOCK,  
RICHARD J. SZEP, and GERLAD A. KILGOUR

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Appeal No. 97-1320  
Application 08/431,001<sup>1</sup>

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ON BRIEF

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Before BARRETT, FLEMING, and DIXON, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

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<sup>1</sup> Application for patent filed April 28, 1995, entitled "Reduced RFI Power Pulse Modulator."

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DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1-5.

We reverse.

BACKGROUND

The disclosed invention is directed to a waveshaping predriver for controlling the application of pulsed current to an inductive load via a voltage controlled power transistor, characterized in that the turn-on and turn-off slew rates of the pulsed current are substantially equal.

Claim 1 is reproduced below.

1. A waveshaping predriver for a voltage controlled power transistor for producing output pulses in response to input pulses applied to said predriver, said predriver comprising:

a constant current source which is turned on and off by said input pulses for producing a control signal coupled to the power transistor for turning the power transistor on and off for each input pulse; and

a waveshaping circuit for limiting said control signal to a predetermined rate of change at turn-on and turn-off including a resistor and capacitor combination coupled to said constant current source such that said capacitor (1) is charged through said constant current source at a rate determined by said resistor when said current source is turned on to establish a desired turn-on slew rate of said output pulses, and (2) is

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discharged through said resistor when said current source is turned off to establish a turn-off slew rate of said output pulses which matches said desired turn-on slew rate.

The Examiner relies on the admitted prior art in Appellants' figure 1 and the following reference:

Sedra, Adel S., and Smith, Kenneth C., Microelectronic Circuits, Saunders College Publishing (3d ed. 1991), pages 241-43, 434-36 (hereinafter "Sedra & Smith").

Claims 1-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art and Sedra & Smith. The Examiner finds that the admitted prior art of figure 1 teaches all the claimed features except for the constant current source. The Examiner notes that the disclosed constant current source is provided by a transistor with an emitter resistor and finds that transistors with emitter resistors were well known in the art as evidenced by Sedra & Smith. The Examiner concludes that "it would have been obvious to one of ordinary skill in the art at the time of the invention to add an emitter resistor to the input circuit (thereby turning it into a current source) of Appellants' Prior Art for the purpose of stabilizing the power modulator against power supply fluctuations" (First Office

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action, Paper No. 2, pages 2-3) or "for the purpose of stabilizing the collector current of the input circuit" (Examiner's Answer, page 4). In the Final Rejection, the Examiner finds that "[t]he problem with the Prior Art (i.e. Fig. 1) is that when the input circuit is activated the waveshaping circuit is adversely influenced by the low output resistance of the input circuit" (Final Rejection, page 2) and concludes that "one of ordinary skill in the art would have been motivated to increase the output resistance of the input circuit [with an emitter resistor as taught by Sedra & Smith]" (Final Rejection, page 3).

We refer to the Final Rejection (Paper No. 4) (pages referred to as "FR\_\_") and the Examiner's Answer (Paper No. 11) (pages referred to as "EA\_\_") for a statement of the Examiner's position and to the Brief (Paper No. 10) (pages referred to as "Br\_\_") for a statement of Appellants' position.

#### OPINION

Appellants argue (Br6): "The rejection of Claims 1-5 is flawed for two reasons: (1) the examiner utilized hindsight to reconstruct the claimed invention from the prior art of

record, and (2) the examiner improperly relied on his own wisdom (albeit in hindsight) in the art of electronics to support the rejection." The Examiner argues that the modifications are not based on hindsight, but would have been obvious to the one of ordinary skill in the art of electrical engineering based on known design goals (EA5-6). We agree with Appellants that the rejection is improperly based on hindsight.

As explained in the description of the admitted prior art of figure 1, the ratio of the resistance of resistor 28 to the resistance of resistor 42 must be large, say, 10:1, to assure that the gate-to-source voltage  $V_{gs}$  is sufficient at low battery voltage to turn on the driver (specification, page 2, lines 26-36). The capacitor 30 and resistor 42 are selected to yield a fast time constant or charge rate (specification, page 3, lines 1-10). "When the transistor [34] turns off, the capacitor 30 discharges through resistor 28. Since resistor 28 is ten times larger than resistor 42 the time constant will be ten times larger, causing the turn-off event to proceed at a much slower rate." (Specification, page 3, lines 10-14.)

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There is no suggestion in connection with the admitted prior art of figure 1 of using a constant current source to overcome the problem of the turn-off time being much greater than the turn-on time due. Sedra & Smith discusses biasing techniques for transistors but contains no teachings that would be relevant to the problems of waveshaping predrivers. While Sedra & Smith would be relevant to the problem of selecting a circuit to provide a constant current source once the constant current source solution had been conceived, it does not provide any motivation for providing a constant current source in a waveshaping predriver circuit in the first place.

Appellants argue that the Examiner has supplied his own reasoning based on hindsight. For example, "[the Examiner] has characterized the problem of the Admitted Prior Art as one of low output resistance of the input circuit, even though there is nothing in the Admitted Prior Art that leads one to this conclusion" (Br7). We agree that the rejections, as stated, do not point to any factual support in the record for the stated motivations (i.e., "for the purpose of stabilizing the power modulator against power supply fluctuations" (First

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Office action, Paper No. 2, pages 2-3), "for the purpose of stabilizing the collector current of the input circuit" (EA4), and "to increase the output resistance of the input circuit" (FR3)). It appears that the Examiner has made up reasons why an emitter resistor would be added using Appellants' teaching of using an emitter resistor as a guide and then said that such a configuration would be a constant current source as claimed. This is classic hindsight. It appears to be true, as observed by Appellants (Br4), that the Examiner was influenced by the substantial similarity between the admitted prior art of figure 1 and the claimed circuit of figure 3. Absent some motivation in the record to do what Appellants have done, the obviousness rejection must fail.

For the reasons stated above, the Examiner has failed to establish a prima facie case of obviousness. The rejection of claims 1-5 is reversed.

REVERSED

LEE E. BARRETT )  
Administrative Patent Judge )  
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