

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte NAOKI KUMAGAI  
and KATSUNORI UENO

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Appeal No. 95-0648  
Application 08/001,199<sup>1</sup>

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ON BRIEF

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Before URYNOWICZ, HAIRSTON and TORCZON, Administrative Patent Judges.

URYNOWICZ, Administrative Patent Judge.

DECISION ON APPEAL

This appeal is from the final rejection of claims 13-19 and 21-23.

The invention pertains to a short protective circuit. Claim 13, the only independent claim, is illustrative and reads as follows:

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<sup>1</sup> Application for patent filed January 7, 1993. According to appellants, this application is a continuation-in-part of Application 07/854,085, filed March 19, 1992, now U.S. Patent No. 5,303,110, granted April 14, 1994.

13. A short protective circuit comprising:

a control terminal;

a first switching element having a control electrode, a first electrode and a second electrode, said first switching element being driven by a signal applied from the control terminal to the control electrode;

a second switching element for current detection having a control electrode, a first electrode and a second electrode, the control electrode and the first electrode of the second switching element being respectively connected to the control electrode and the first electrode of the first switching element, the second electrode of the second switching element being connected to the second electrode of the first switching element through a current detecting resistor;

a branch circuit having a discharge switching element, said branch circuit connected to a circuit connection between the control terminal and the control electrode of the first switching element;

means for reducing a drive signal of the first switching element by activating the discharge switching element when an excessive current flows through a current detecting resistor, said discharge switching element maintaining the reduced drive signal when the excessive current flowing through the first switching element is suppressed as the drive signal decreases; and

means for deactivating the discharge switching element when a signal applied to the control terminal becomes zero or opposite in polarity from the drive signal after the drive signal is reduced.

The references relied upon by the examiner are:

Okado et al. (Okado)	4,719,531	Jan. 12, 1988
Mihara et al. (Mihara)	4,893,158	Jan. 09, 1990
Kumagai	5,303,110	Apr. 12, 1994 (filed Mar. 19, 1992)

Appellants' acknowledged prior art shown in Figs. 7 and 8 and described at pages 1-7 of their specification.

The appealed claims stand rejected under 35 U.S.C. § 103 as being unpatentable over the acknowledged prior art in view of Okado and Mihara.

The appealed claims also stand rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-12 of Kumagai in view of Okado and Mihara.

The respective positions of the examiner and the appellants with regard to the propriety of the rejection under 35 U.S.C. § 103 are set forth in the final rejection (Paper No. 8), the examiner's answer (Paper No. 13), a supplemental examiner's answer (Paper No.15) and a second supplemental examiner's answer (Paper No. 19) and the appellants' second substitute brief on appeal (Paper No. 18). The respective positions of the examiner and the appellants with regard to the obviousness double patenting rejection are set forth in the supplemental examiner's answer and appellants' second substitute brief on appeal.

#### Appellant's Invention

Appellants' device is illustrated in Fig. 9. It comprises a short protective circuit having a control terminal G, a first transistor 10, and a second transistor 20. The control terminal is connected to the control electrodes of the first and second transistors; the first electrode of the first transistor is connected to the first electrode of the second transistor; and the second electrode

of the first transistor is connected to the second electrode of the second transistor through a current detecting resistor 40. A branch circuit having a discharge transistor 50 is connected between the control and second electrodes of the first transistor.

When an excessive current flows through the current detecting resistor 40 due to a short in the load circuit of the first transistor, diode 65 reduces a drive signal of the first transistor 10 by activating transistor 50. The reduced drive signal is maintained as the excessive current flowing through transistor 10 is suppressed to protect the transistor. Diode 42 deactivates discharge transistor 50 when a signal applied to the control terminal G becomes zero or opposite in polarity.

The Rejection under 35 U.S.C. §103 over the  
Admitted Prior Art, Okado and Mihara

After consideration of the positions and arguments presented by both the examiner and the appellants, we have concluded that this rejection should not be sustained.

With respect to claim 13, the sole independent claim, all of the claim limitations, except for the last limitation, are met by the admitted prior art illustrated in appellants' Fig. 8<sup>2</sup>. However, neither Okado nor Mihara makes up for the deficiency of the admitted prior art by teaching the last limitation of claim 13 which reads,

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<sup>2</sup> The "means for reducing", the penultimate limitation and only other limitation which might possibly be considered as not taught by the Fig. 8 prior art circuit, is met by resistors 30 and 65 which lower the voltage applied to gate 105 of the first switching element 10 (appellants' specification at page 4, lines 18-26).

means for deactivating the discharge switching element when a signal applied to the control terminal becomes zero or opposite in polarity from the drive signal after the drive signal is reduced.

The examiner's position in the supplemental examiner's answer (Paper No. 19) is that this limitation is met by Fig. 7 of Okado and that MOSFET 30 short circuits and deactivates the switching element gate transistor 26 during a negative control signal. Reference is made by the examiner to column 7, lines 45+, of Okado.

We disagree with this position. MOSFET 30 does not short circuit the gate of switching element transistor 26 because of the large time constant exhibited by elements 28 and 29. At column 7, lines 45-54, no reference is made to transistor 26, indicating that it is deactivated as urged by the examiner. Contrary to the examiner's position, at column 8, lines 26-35, Okado teaches that the time constant of resistor 28 and diode 29 is large, such that the on time of transistor 26 is longer than the oscillatory time of the voltage between the drain and source of the BIFET transistor 1. This is the same type of operation as disclosed for appellants' embodiment of Fig. 5, wherein there is no deactivation of the discharge transistor 50. In that embodiment, diode 65 and resistor 66 correspond to aforementioned diode 29 and resistor 28, and the discharge transistor 50 of Fig. 5 cannot be deactivated when a signal applied to the control terminal G becomes zero or opposite in polarity because of the charge retained on the gate of transistor 50 due to the time constant of elements 65 and 66. It is only by the addition of a diode, such as diode 42 in Fig. 9, that discharge transistor 50 can be deactivated when a signal applied to the

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control terminal G becomes zero or opposite in polarity. This is illustrated in appellants' Fig. 10, waveform (d), at time  $t_3$ .

In his answers, the examiner has not indicated how Mihara is applied against claim 13. In the first office action (Paper No. 4), the examiner relied on the embodiments illustrated in Figs. 29 and 30 of Mihara. Because the examiner has not specifically indicated where in either of these figures Mihara teaches means for deactivating a discharge switching element as defined in claim 13 and because no such means is apparent in the reference, we will not sustain the rejection to the extent it relies on Mihara.

Because neither Okado nor Mihara teaches the "means for deactivating" of sole independent claim 13, a prima facie case of obviousness has not been established and the rejection is not sustained. Whereas claims 14-19 and 21-23 depend from claim 13, the rejection of these claims under 35 U.S.C. § 103 over the admitted prior art, Okado and Mihara is not sustained.

The Rejection under Obviousness Type Double Patenting  
over Claims 1-12 of Kumagai in View of Okado and Mihara

Whereas we have found that neither Okado nor Mihara teaches the last limitation of independent claim 13, we will not sustain this rejection.

Summary

In summary:

a) The rejection of claims 13-19 and 21-23 under 35 U.S.C. § 103 as being unpatentable over the acknowledged prior art in view of Okado and Mihara is reversed.

b) The rejection of claims 13-19 and 21-23 under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-12 of U.S. Patent 5,303,110 to Kumagai in view of Okado and Mihara is reversed.

REVERSED

STANLEY M. URYNOWICZ, JR.	)	
Administrative Patent Judge	)	
	)	
	)	BOARD OF PATENT
	)	APPEALS AND
KENNETH W. HAIRSTON	)	INTERFERENCES
Administrative Patent Judge	)	
	)	
	)	
RICHARD TORCZON	)	
Administrative Patent Judge	)	

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