

**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(2) is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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**Ex parte** RAYMOND W. MacKENZIE  
and JOSEPH C. ENGEL

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Appeal No. 96-2838  
Application 08/336,721<sup>1</sup>

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ON BRIEF

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Before JERRY SMITH, FLEMING and HECKER, **Administrative Patent Judges.**

HECKER, **Administrative Patent Judge.**

**DECISION ON APPEAL**

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<sup>1</sup> Application for patent filed November 9, 1994. According to appellants, this application is a continuation of Application 08/023,435, filed February 26, 1993 (now abandoned).

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This is a decision on appeal from the final rejection of claims 1 through 4 and 6 through 14. Claim 5 has been canceled.

Appellants' invention relates to a circuit breaker which is responsive to sputtering arc faults which can occur when bared conductors of an electrical system come into close proximity. The breaker can discriminate between inrush currents and sputtering arc faults to avoid false trips.

On page 4 **et seq.** of the specification and Figure 1, Appellants disclose a circuit breaker 1 protecting an electric system 7 which includes a line conductor 9 and a neutral conductor 11. Ground fault detector 5 recognizes line-to-ground fault 17 and neutral-to-ground fault 19. Current sensor 21 detects line-to-ground faults and applies the signal to IC 29. IC 29 turns on SCR 39 which energizes trip solenoid 41 to actuate the trip mechanism 49 to open contacts 51.

Sputtering arc detector 3 recognizes arc fault 15 (Brief at bottom of page 3). Current sensor 23 produces a rate of change of current signal,  $di/dt$ , for sputtering arc faults. The  $di/dt$  signal is bandwidth limited by low pass filter 67 such that only step increases in current are applied to window

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comparator 97 (Figure 2). The window comparator 97 determines whether selected thresholds have been reached representative of sputtering arc faults. Timer 107 produces an output if two step increases in current (e.g., events) are detected within a selected time period. If two events have occurred within the selected time period, SCR 39 is turned on, energizing trip coil 41 which operates trip mechanism 49 to open contacts 51.

Independent claim 13 is reproduced as follows:

13. A circuit breaker for protecting an electrical system from ground faults and sputtering arc faults, comprising current sensing means sensing current flowing in said electrical system; ground fault sensing means connected to said current sensing means and operative to generate a trip signal in response to a ground fault in said electrical system; sputtering arc fault sensing means connected to said current sensing means to generate a trip signal in response to at least two successive step increases in current in said electrical system above a designated magnitude within a selected time interval; and trip means responsive to trip signals generated by said ground fault sensing means and by said sputtering arc sensing means to interrupt current flowing in said electrical system.

The references relied on by the Examiner are as follows:

Dewey	3,673,455	June 27, 1972
Moser et al. (Moser)	4,402,030	Aug. 30, 1983
Spencer	4,949,214	Aug. 14, 1990

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**Raytheon** Publication, Linear Integrated Circuits, "RV4145 Low Power Ground Fault Interrupter," Section 10, Pages 10-16 through 10-21 (1989)

Claims 1 through 4 and 6 through 12 stand rejected under 35 U.S.C. § 103 as unpatentable over Spencer in view of Dewey and Moser.

Claim 13 stands rejected under 35 U.S.C. § 102 as being anticipated by Spencer.

Claim 14 stands rejected under 35 U.S.C. § 103 as being unpatentable over Spencer in view of Dewey and Raytheon.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the brief and the answer for the respective details thereof.

#### **OPINION**

After a careful review of the evidence before us, we will not sustain the rejections of claims 1 through 4, 6 through 12 and 14 under 35 U.S.C. § 103 and claim 13 under 35 U.S.C. § 102.

For purposes of this appeal, we will treat claim 13 as the representative claim.

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It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim. **See In re King**, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986) and **Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.**, 730 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984). "Anticipation is established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed invention." **RCA Corp. v. Applied Digital Data Sys., Inc.**, 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984), **cert. dismissed**, 468 U.S. 1228 (1984), citing **Kalman v. Kimberly-Clark Corp.**, 713 F.2d 760, 772, 218 USPQ 781, 789 (Fed. Cir. 1983).

We note that Appellants' claim 13 recites "sputtering arc fault sensing means...to generate a trip signal in response to at least two successive step increases in current in said electrical system above a designated magnitude within a selected time interval...." Appellants argue on page 6 of the brief that Spencer does not disclose this limitation.

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Appellants point out (brief at page 9) that Spencer does not count step increases in current in the electrical system, and does not count step increases within a preselected time interval. According to Appellants, Spencer counts half cycles of line current which exceed a threshold value, and thus would respond to a single step increase in current in the electrical system if the Spencer threshold were exceeded for a sufficient count of half cycles (Spencer at column 9, lines 19 through 35).

The Examiner responds (answer at page 9) that "Spencer is responsive and will record anything which is above his predetermined threshold, including two successive step increases in current," and that this meets the language of claim 13 "arc fault sensing means...in response to at least two successive step increases in current". The Examiner's quote of claim 13 stops short of very significant language, i.e., "...increases in current **in said electrical system.**" Increases in current **in said electrical system** represent separate arc faults, but Spencer is counting half cycles of arc signal (e.g., half cycle current increases) which

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represent **how long** a current increase **in said electrical system** has lasted. The Examiner's statement (answer, top of page 10) that Spencer's "circuit breaker will trip when the current exceeds a predetermined maximum allowable current value 'for a specified period of time'" confirms this time period measurement.

We find that Spencer does not meet the claim 13 limitation as discussed **supra**.

Turning to the 35 U.S.C. § 103 rejection of claim 1, we find the Examiner has failed to set forth a **prima facie** case. It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the reasonable teachings or suggestions found in the prior art, or by a reasonable inference to the artisan contained in such teachings or suggestions. **In re Sernaker**, 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983).

Claim 1 recites "current sensing means sensing current flowing **in said electrical system**" and "event signal

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generating means responsive to...to pass **step increases in current**" and "means generating a trip signal in response to a plurality of event signals within a preselected time interval."

The Examiner states (answer at page 10) that "Claim 1 recites a means for generating a trip signal in response to a plurality of event signals within a preselected time interval, which Spencer does." However, we find that Appellants' event signals are claimed to correspond to step increases in current, but Spencer's events are half cycles of ac signal. As noted for claim 13 **supra**, Spencer does not count step increases in current **in said electrical system** within a preselected time interval. Rather, Spencer counts half cycles of ac signal (e.g., half cycle current increases) which represent **how long** a current increase **in said electrical system** has lasted. We find that Spencer does not meet this similar limitation in claim 1.

Since the combination of Spencer, Dewey and Moser fails to disclose the claim 1 limitation **supra**, the Examiner has failed to set forth a **prima facie** case.

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The remaining claims on appeal also contain the above limitations discussed in regard to claims 1 and 13 and thereby, we will not sustain the rejection as to these claims.

In view of the foregoing, the decision of the Examiner rejecting claims 1 through 4, 6 through 12 and 14 under 35 U.S.C. § 103 and claim 13 under 35 U.S.C. § 102 is reversed.

**REVERSED**

	JERRY SMITH	)	
	Administrative Patent Judge	)	
		)	
		)	
		)	
	MICHAEL R. FLEMING	)	BOARD OF
PATENT	Administrative Patent Judge	)	APPEALS AND
		)	INTERFERENCES
		)	
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	STUART N. HECKER	)	
	Administrative Patent Judge	)	

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