

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(2) is not binding precedent of the Board.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. 14

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte RICHARD A. BURGIE and ERIC M. FLEMING

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Appeal No. 95-3422  
Application 07/891,132<sup>1</sup>

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ON BRIEF

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Before WINTERS, GRON, and PAK, Administrative Patent Judges.  
GRON, Administrative Patent Judge.

DECISION ON APPEAL UNDER 35 U.S.C. § 134

Introduction

This is an appeal under 35 U.S.C. § 134 from an  
examiner's rejection of Claims 1-21, all claims pending in the

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<sup>1</sup> Application for patent filed June 1, 1992.

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application.

Claims 1-3 stand rejected under 35 U.S.C. § 103 as being unpatentable in view of the teaching of Levin, U.S. 4,737,348, patented April 12, 1988, and the acknowledged prior "existence of a commercially available material comprising a silicon carbide coated carbon fiber composite, page 12 of the specification" (Examiner's Answer, p. 4). Claims 4-9 and 12-21 stand rejected under 35 U.S.C. § 103 as being unpatentable in view of the combined teachings of Levin, Richerson et al. (Richerson), U.S. 3,895,219, patented July 15, 1975, and the acknowledged prior "existence of a commercially available material comprising a silicon carbide coated carbon fiber composite, page 12 of the specification" (Examiner's Answer, p. 4). Claims 10-11 stand rejected under 35 U.S.C. § 103 as being unpatentable in view of the combined teachings of Levin and Richerson.

In the Examiner's Answer, pp. 9-14, the examiner entered NEW GROUNDS of rejection of Claims 1-21 under 35 U.S.C. § 103 as being unpatentable in view of the aforementioned combination of prior art teachings and acknowledgments, further in view

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of the teaching of Endou et al. (Endou), U.S. 4,596,741, patented June 24, 1986, or Galasso et al. (Galasso), U.S. 4,373,006, patented February 8, 1983. However, in the first paragraph of the Supplemental Examiner's Answer (Paper # 13, mailed August 9, 1994), the examiner withdrew the new grounds of rejection. Claims 1, 4, and 10 are representative of the subject matter on appeal and read:

1. A reactor comprising: a reaction vessel defining a chamber for contacting chlorosilane and hydrogen gases  
at temperatures greater than about 600°C, where the reaction vessel is formed from a silicon carbide coated carbon fiber composite.
4. A reactor comprising: a reaction vessel defining a chamber for contacting chlorosilane and hydrogen gases  
at temperatures greater than about 600°C, where the reaction vessel is heated by a heating element formed from a silicon carbide coated carbon fiber composite.
10. A reactor comprising: a reaction vessel defining a chamber for contacting chlorosilane and hydrogen gases  
at temperatures greater than about 600°C, a heating element, and a silicon nitride insulator electrically insulating the heating element.

#### Discussion

We reverse the examiner's rejections of Claims 1-21 because the examiner has not met the PTO's initial burden of

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establishing a prima facie case of unpatentability under 35 U.S.C. § 103. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988):

The PTO has the burden under section 103 to establish a prima facie case of obviousness. See *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-87 [sic, 88] (Fed. Cir. 1984). It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.

The statements made in Fine at 1075, 5 USPQ2d at 1599, equally apply to the rejections of the subject matter claimed in this case under section 103:

Obviousness is tested by "what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). But it "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. . . . And "teachings of references can be combined *only* if there is some suggestion or incentive to do so." . . . Here, the prior art contains none.

The examiner has rejected Claims 1-9 and 12-21 based on a finding that appellants' acknowledgment of the prior existence of a commercially available material comprising a silicon carbide coated carbon fiber composite prima facie would have led persons having ordinary skill in the art to form both a "reaction vessel defining a chamber for contacting

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chlorosilane and hydrogen gases at temperatures greater than about 600°C" (Claim 1), the walls of which had been made of silicon carbide coated graphite or carbon material (Levin, col. 3, l. 58-63), and/or its "heating element" (Claim 4), which had been made of silicon carbide and/or silicon nitride (Richerson, col. 2, l. 24-27 and 49-55), from the same commercially available material. The examiner's finding is clearly erroneous. For obviousness under section 103, the prior art "teachings . . . can be combined *only* if there is some suggestion or incentive to do so." In re Fine, supra. Here, the teachings provide no suggestion or incentive to use the commercially available material for any reason. We might speculate as to possible reasons for the substitution. However, we find that the examiner's basis for the substitution is the hindsight of appellants' disclosure rather than any prior art teachings. Moreover, there is no evidence of record that persons having ordinary skill in the art were aware of problems associated with Levin's reaction vessel or the graphite heating elements used in Levin's reactor. Absent recognition of problems with Levin's reactor or heating elements, we fail to see why persons having ordinary skill in

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the art would have wanted to solve them. Accordingly, we reverse the examiner's rejections of Claims 1-9 and 12-21.

Claims 10 and 11 present a slightly different issue because Richerson describes a silicon nitride electrical insulating layer or jacket integrally bonded to a silicon carbide/silicon nitride heating element (Richerson, col. 2, l. 49-68). The examiner argues that it would have been prima facie obvious in view of Richerson's teaching to apply a high temperature resistant silicon nitride electrical insulating layer or jacket to the heating element of Levin's reactor. On consideration of the prior art teaching as a whole, we find the examiner's argument untenable.

First, Richerson describes a silicon nitride electrical insulating layer or jacket hot-pressed to a silicon carbide/silicon nitride heating element. Richerson does not indicate that silicon nitride electrical insulating layers or jackets may be applied to, or are useful as electrical insulators for, heating elements generally. See Richerson's Example 1, col. 5, l. 35-51:

A graphite mold set-up was assembled with the exception of the top plate. An 81.0 gram quantity of the silicon nitride powder was spread in the mold, followed by 21.7

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grams of the silicon carbide-silicon nitride mixture which was spread level; then the center was scraped out with a flat edge scraper to provide a thin section **4** in Fig. **1**. This results in the end portions **5** having twice the thickness of the center **4**. This was then followed by a 77.3 gram quantity of the silicon nitride powder which was uniformly spread and leveled. The graphite mold plate was put in position and the tri-layered content of the mold cavity was hot-pressed at 2,000 p.s.i. at 1,750°C for 60 minutes.

Electrical leads were connected to the silicon nitride-silicon carbide resistor core of the plate thus producing an insulated heating element . . . .

On the other hand, referring to the reactor depicted in Fig. **1**, Levin teaches (Levin, col. 5, l. 17-24):

[T]he outer cylinder **12** is provided with suitable entry ports for copper or like conduits **28** which conduct current for energizing graphite, "picket fence" type resistance heaters **30** surrounding the inner reactor apparatus **10**. The resistance heaters **30** and the inner reactor apparatus **32** are separated from one another by a high temperature resistant electrical insulator **31**.

We have considered the teachings of Levin and Richerson as a whole. We fail to see why persons having ordinary skill in the art would have been led by the combined teachings to insulate Levin's energizing graphite, "picket fence" type resistance heaters **30** from the graphite or other carbon reactor material which forms the walls of Levin's reactor **32**

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using a high temperature resistant electrical insulator **31** made of silicon nitride. While we find from Richerson's teaching that silicon nitride is indeed a high temperature resistant electrical insulator for silicon carbide-silicon nitride heating elements, the examiner has not explained why Richerson's use of silicon nitride hot-pressed to a silicon carbide-silicon nitride heating element would have suggested hot-pressed silicon nitride for use in electrically insulating graphite reactor walls from graphite heating elements. The reasons for the combination escape us.

Accordingly, we also reverse the examiner's rejection of Claims 10 and 11 under section 103. In so doing, we repeat the wisdom of In re Fine, 837 F.2d at 1074, 5 USPQ2d at 1598:

The PTO has the burden under section 103 to establish a prima facie case of obviousness . . . [and] can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.

#### Conclusion

We reverse all the examiner's rejections of Claims 1-21 under 35 U.S.C. § 103.

REVERSED

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	Sherman D. Winters	)	
	Administrative Patent Judge	)	
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	Teddy S. Gron	)	BOARD OF
PATENT		)	
	Administrative Patent Judge	)	APPEALS AND
		)	INTERFERENCES
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	Chung K. Pak	)	
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