

Appeal No. 1996-2718  
Application No. 08/221,207

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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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte DOUGLAS D. ZEIGLER,  
BARRY L. CONRAD,  
and RICHARD A. GLEIXNER

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Appeal No. 1996-2718  
Application No. 08/221,207<sup>1</sup>

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ON BRIEF

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Before DOWNEY, WILLIAM F. SMITH, and LORIN, Administrative Patent Judges,  
DOWNEY, Administrative Patent Judge.

DECISION ON APPEAL

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<sup>1</sup> This application, filed March 31, 1994, is a divisional continuation of 07/921,821, filed July 29, 1992 and now U.S. Pat. No. 5,759,961, granted on June 2, 1998, which is a continuation-in-part of 07/648,461, filed

This is an appeal under 35 U.S.C. ' 134 from the final rejection of claims 1-4, 6-8, and 10, all the claims remaining in the application.

Claim 1, the only independent claim, is illustrative of the subject matter on appeal and reads as follows:

A method of producing flexible fibers of a superconducting material, comprising:

melting a superconducting material in a furnace containing a heating space;

heating the melted superconducting material to a temperature above its melting point to form a stream of melted superconducting material;

dropping the stream of the melted superconducting material into a vertically extending barrel of a nozzle;

heating a fiberizing gas to a temperature ranging from 150EF to 750EF;

blowing the heated fiberizing gas downwardly through the barrel of the nozzle at a sufficient rate to transform the dropped superconducting material in the barrel into fine ligaments which cool and solidify in the barrel to form flexible superconducting fibers; and

collecting the flexible superconducting fibers.

The references relied upon by the examiner are:

Walz et al. (Walz)	3,283,039	Nov. 1, 1966
Wagner et al. (Wagner)	4,676,815	Jun. 30, 1987
Bock et al. (Bock)	5,047,391	Sept. 10, 1991

(filed Aug. 18, 1989)

#### Rejections

A. Under 35 U.S.C. ' 112, first paragraph, claim 4 is rejected as not having support in the originally filed specification for the invention as now claimed.

B. Under 35 U.S.C. ' 112, second paragraph, claims 1-4, 6-9, and 10 are rejected as indefinite for failing to particularly point out and distinctly claim the subject matter which the appellants regard as

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January 31, 1991 and now abandoned.

the invention.

C. Under 35 U.S.C. ' 103, claims 1-4, 6-8, and 10 stand rejected as obvious to one of ordinary skill in the art at the time the invention was made.

1. Claims 1-4, 7, 8, and 10 are rejected as unpatentable over Walz in view of Bock.<sup>2</sup>

2. Claim 6 is rejected over Walz in view of Bock, as applied to claims 1-4, 7, 8, and 10 above, and further in view of Wagner.

Claims at issue

D. Claims 1-4, 6-8, and 10 are pending, with claims 1, 4, and 6 at issue.

1. Claim 1 is directed to a method of producing flexible fibers of superconducting material<sup>3</sup>, comprising the steps:

- a. melting a superconducting material in a furnace containing a heating space;
- b. heating the melted superconducting material to a temperature above its melting point to form a stream of melted superconducting material;
- c. dropping the stream into a vertically extending barrel of a nozzle;
- d. blowing a heated fiberizing gas downwardly through the barrel of the nozzle,

wherein

- i. the fiberizing gas has been heated to 150-750EF;
- ii. the fiberizing gas is blown at a rate sufficient to transform the

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<sup>2</sup> Claim 7 depends from claim 6, yet claim 6 is not included in this rejection.

<sup>3</sup> The present specification is directed to high temperature superconductors based on copper oxides. See the present specification, p. 2, para. 3, through p. 9, para. 3.

dropped material into fine ligaments which cool and solidify in the barrel to form flexible superconducting fibers; and

e. collecting the flexible superconducting fibers.

2. Claim 4 provides that the superconducting material in the method of claim 1 is

$\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_8$ .<sup>4</sup>

3. Claim 6 provides that the stream in the method of claim 1 is dropped in a collar in the furnace to maintain the temperature of the stream before it reaches the barrel which is outside of the furnace.

Prior art cited by the examiner as evidence of obviousness

E. Walz is cited as the primary reference for the first and second grounds of rejection under 35 U.S.C. § 103.

1. Walz teaches a method of producing fibers of glass, among other materials (col. 1, lines 10-15), comprising the steps:

a. melting material (Fig. 1; col. 3, lines 45-50);

b. heating the melted material to a temperature above its melting point to form a stream of melted material (col. 1, lines 48-56);

c. dropping the stream into a vertically extending barrel of a nozzle (Fig. 1; col. 3, lines 45-50);

d. blowing a heated fiberizing gas downwardly through the barrel of the nozzle (Figs. 1, 2a, 2b; col. 3, line 43, through col. 4, line 57), wherein

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<sup>4</sup> Claim 4 depends on claim 3, which in turn depends on claim 2, which in turn depends on claim 1.

i. the fiberizing gas has been heated to above 212°F, e.g., high pressure steam (col. 2, lines 35-46);

ii. the fiberizing gas is blown at a rate sufficient to transform the dropped material into fine ligaments which cool and solidify in the barrel to form flexible fibers (col. 3, lines 43-65); and

e. collecting the fibers (col. 1, lines 10-35).

2. Walz does not teach:

a. the production of high temperature superconducting fibers;

b. the production of ceramic fibers;

b. heating the glass material in a furnace having a heating space;

c. with respect to present claim 6, the concept of dropping a stream of molten superconductor in a collar in the furnace to maintain its temperature before the stream reaches the barrel.

F. Bock is cited as a secondary reference for the first and second grounds of rejection under 35 U.S.C. § 103.

1. Bock teaches:

a. a superconducting ceramic material such as a Bi-based material in which the species  $\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_8$  would fall (Abstract; col. 1, lines 11-30);

b. shaping Bi-based superconducting material by melting the material to produce articles having superconducting properties (col. 1, lines 52-68).

2. Bock does not teach making the fiber form of superconducting material.

G. Wagner is cited as a secondary reference for the second ground of rejection under 35 U.S.C. § 103.

1. Wagner teaches:
  - a. an electrically heated crucible which has a hole at the bottom through which the molten stream of material to be fiberized is passed (Abstract; col. 1, line 39, through col. 2, line 40);
  - b. fine mineral fibers, particularly glass fibers and diabase fibers (col. 1, lines 15-27);
  - c. heating the fiberizing gas to temperatures of 800-1400<sup>°C</sup>, i.e., 1472-2552<sup>°F</sup> (col. 4, lines 20-25).
2. Wagner does not teach:
  - a. a superconducting material;
  - b. heating the fiberizing gas to a temperature ranging from 150-750<sup>°F</sup>.

#### OPINION

We reverse all of the aforementioned rejections. The examiner has not sustained his burden of providing sufficient bases for his rejections of the claims under 35 U.S.C. § 112, first and second paragraphs, and § 103.

#### Rejection under 35 U.S.C. § 112, second paragraph

The examiner rejects claims 1-4, 6-8, and 10 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the appellants regard as the invention. Claim 1 has the phrase "heating the melted superconducting material to a temperature above its melting point to form a stream of melted superconducting material", which the examiner asserts is

indefinite because it is not clear how the step of "heating" would "form" a stream instead of just a molten bath.<sup>1</sup>

We reverse this rejection under 35 U.S.C. ' 112, second paragraph. Claim 1 involves a melted superconducting material which is further heated to form a "stream", i.e., a material which can be dropped into a barrel. Regardless of whether the melted superconducting material is flowing or stationary at any particular moment, it still is a "stream" because it is capable of being dropped into a barrel. The specification further indicates at p. 7, lines 14-18, that the melted superconducting material is superheated to reduce its viscosity so that it flows freely as a continuous stream. In the context of claim 1 and in view of the present specification, therefore, the examiner has not sustained his burden of showing indefiniteness. The claim language is not read in a vacuum, but rather, the test for definiteness under 35 U.S.C. ' 112, second paragraph, is whether the claim language circumscribes the invention with reasonable precision and particularity for one of ordinary skill in view of the disclosure and the prior art. See In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971).

Rejection under 35 U.S.C. ' 112, first paragraph

The examiner rejects claim 4 under 35 U.S.C. ' 112, first paragraph, because the specification as originally filed does not provide support for the invention as now claimed.<sup>5</sup> By amendment on November 14, 1994, claim 4 was changed from the formula " $\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_x$ " to -  $\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_8$  -. The examiner argues that the --  $\text{O}_8$  -- in the formula is found in the background portion of the specification rather than the description portion, and thus

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<sup>5</sup> Examiner's Answer, filed February 4, 1996, pp. 3 and 4.

support is not found in the specification as originally filed.<sup>6</sup>

We reverse this rejection under 35 U.S.C. ' 112, first paragraph. Support is found in the following excerpt from p. 3, lines 15-17, of the originally filed specification:

With the development of gas fiberization techniques by The Babcock & Wilcox Company, the preparation of the high temperature superconductor  $\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_8$  from the melt became possible.

Regardless of its location in the background section of the specification, the excerpt clearly indicates that the subject matter of the present invention includes superconductors of the formula  $\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_8$ . The originally filed specification has conveyed, with reasonable clarity to one of ordinary skill in the art, that the appellants were in possession of the claimed invention on the date of filing. See Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ 2d 1111, 1117 (Fed. Cir. 1991).

#### Rejections under 35 U.S.C. ' 103

The examiner rejects claims 1-4, 7, 8, and 10 under 35 U.S.C. ' 103 as unpatentable over Walz in view of Bock. Even though Walz does not teach superconducting materials, the examiner maintains that Bock teaches Bi based superconducting materials which can be shaped by melting and thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the Bi based superconducting material of Bock in the fiber-making process of Walz.<sup>7</sup> The examiner

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<sup>6</sup> Supra, p. 8.

<sup>7</sup> Supra, p. 5.

adds "that one skilled in the art of ceramic processing has the knowledge required to select the appropriate molding method required to produce a particular shape."<sup>8</sup> The examiner further argues that since Walz provides a molten material, "the selection of the specific apparatus used to provide such material would have been obvious to one skilled in the art" and "an obvious matter of design choice."<sup>9</sup>

We reverse this rejection under 35 U.S.C. ' 103. As discussed above, Walz does not teach the production of superconducting materials or ceramic fibers and Bock does not teach making fibers out of ceramic superconducting material. Neither reference teaches superconducting fibers, a required element in the presently claimed invention, nor does either reference teach ceramic fibers. Because the examiner has not met all the limitations of the claimed invention, he has not established a prima facie case of obviousness under 35 U.S.C. ' 103. See In re Brouwer, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1996). The examiner also has not shown any suggestion in the prior art for combining the teachings of Walz and Bock to arrive at the presently claimed invention. Walz does not indicate that fibers can be made from superconducting or ceramic materials, nor does Bock teach that the ceramic superconducting materials can be made into fibers. The examiner has not pointed to any suggestion, to one of ordinary skill in the art at the time the invention was made, that the ceramic superconducting material of Bock or ceramic materials in general could be made into the fibers of Walz. The examiner therefore has not sustained his burden of making a prima facie showing, based on the record as a whole, that the claimed invention would have been obvious to one of ordinary skill in the art at the time the

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<sup>8</sup> Supra, pp. 10 and 11.

<sup>9</sup> Supra, pp. 6 and 12.

invention was made. See In re Dembiczak, 175 F.3d 994, 998, 50 USPQ2d 1614, 1616 (Fed. Cir. 1999); and In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Reliance on the present specification to provide that suggestion constitutes impermissible hindsight. See Oetiker, 977 F.2d at 1447, 24 USPQ2d at 1445-1446.

The examiner further relies upon Ex parte Pfeiffer, 135 USPQ 31, 33 (Bd. App. 1961) for the proposition that structural limitations are not given weight in a method claim unless those limitations "affect the method in a manipulative sense and not amount to mere claiming of a particular structure."<sup>10</sup> In effect, the examiner has labeled the claim limitation as a "structural limitation" and then extracted a *per se* rule from Pfeiffer that structural limitations do not patentably distinguish over the prior art in a method claim. The court made it clear in In re Ochiai, 71 F.3d 1565, 37 USPQ2d 1127 (Fed. Cir. 1995) that there are no *per se* rules when determining obviousness under 35 U.S.C. § 103. As stated in Ochiai, 71 F.3d at 1572, 37 USPQ2d at 1133:

The use of *per se* rules, while undoubtedly less laborious than a searching comparison of the claimed invention - including all its limitations - with the teachings of the prior art, flouts section 103 and the fundamental case law applying it. *Per se* rules that eliminate the need for fact-specific analysis of claims and prior art may be administratively convenient for PTO examiners and the Board. Indeed, they have been sanctioned by the Board as well. But reliance on *per se* rules of obviousness is legally

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<sup>10</sup> Supra, pp. 6 and 12.

incorrect and must cease. Any such administrative convenience is simply inconsistent with section 103, which, according to Graham [v. John Deere Co.], 383 U.S. 1, 148 USPQ 459 (1966)] and its progeny, entitles an applicant to issuance of an otherwise proper patent unless the PTO established that the invention as claimed in the application is obvious over cited prior art, based on the specific comparison of that prior art with claim limitations. We once again hold today that our precedents do not establish any *per se* rules of obviousness, just as those precedents themselves expressly declined to create such rules. Any conflicts as may be perceived to exist derive from an impermissible effort to extract *per se* rules from decisions that disavow precisely such extraction.

To paraphrase the court in Ochiai, 71 F.3d at 1570, 37 USPQ2d at 1132, "there are not [Pfeiffer] obviousness rejections . . . but rather only section 103 obviousness rejections."

Since the rejection of claims 1-4, 7, 8, and 10 as unpatentable over Walz in view of Bock has been reversed, the separate rejection of dependent claim 6 as unpatentable over Walz in view of Bock and Wagner must be set aside as well. Wagner also fails to provide the necessary teachings or suggestions which Walz and Bock lack. While Wagner teaches "fine mineral fibers, in particular glass fibers and diabase fibers" at col. 1, lines 5-10, the reference does not teach flexible superconducting fibers of the type presently claimed nor has the examiner pointed to any suggestion in the reference about modifying the teachings of Walz or Bock to arrive at the flexible superconducting fibers presently claimed. Moreover, the reference teaches heating the fiberizing gas to 800-1400EC (1472-2552EF) at col. 4, lines 19-25, which "teaches away" from the 150-750EF presently claimed. Prior art references must be considered in their entirety, i.e., as a whole, including portions that would lead away from the claimed invention. See W.L. Gore & Associates, Inc. v. Garlock, 721 F. 2d 1540, 1550, 220 USPQ 303, 311 (Fed. Cir. 1983), cert. den., 469 U.S. 851 (1984).

CONCLUSION

The rejections under 35 U.S.C. ' 112, first and second paragraph, are reversed. The rejections under 35 U.S.C. ' 103 also are reversed.

REVERSED

MARY F. DOWNEY  
Administrative Patent Judge

WILLIAM F. SMITH  
Administrative Patent Judge

HUBERT C. LORIN  
Administrative Patent Judge

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ipra, pp. 3 and 8.