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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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 270

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

MAILED

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SEP 30 1999

PATENT OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

v.

ROBERT B. BEYERS, EDWARD M. ENGLER,
PAUL M. GRANT, GRACE S. LIM,
and STUART S.P. PARKIN²
Junior Party,²

v.

BERTRAM J. BATLOGG, ROBERT J. CAVA
and ROBERT B. VAN DOVER³
Senior Party³

Patent Interference No. 101,981

Final Hearing: July 14, 1994

¹ Application 07/158,483, filed February 22, 1988. Assignor to Naval Research Laboratory.

² Application 07/024,653, filed March 11, 1987. Assignor to IBM Corporation.

³ Application 07/021,229, filed 03/03/87. This application is a continuation-in-part of application 07/001,682, filed January 9, now abandoned. Assignor to Lucent Technologies, Inc.

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Before CAROFF, DOWNEY, WILLIAM F. SMITH, and LORIN, Administrative Patent Judges.⁴

LORIN, Administrative Patent Judge.

BACKGROUND

When originally declared, this interference involved four parties and was captioned Qadri et al. v. Chu v. Beyers at al. v. Batlogg et al. In a decision on motions (paper no. 131), the Administrative Patent Judge (APJ)⁵ granted both Chu's motion under §§1.633(i) and (c)(4) (paper no. 95) to redefine the interfering subject matter to exclude those claims, claims 16, 20-28, 47-49, 56-65 and 82-93, not limited to single-phase compositions and Beyers' motion for judgment under §1.633(a) (paper no. 37) against Chu on grounds that Chu's claim 94 lacked adequate support, i.e., written description and enablement, for including inoperative species. As a result of granting Chu's motion, this interference was redeclared (paper no. 132) to

⁴ The three member panel which heard the oral argument consisted of Administrative Patent Judges Ronald H. Smith, Caroff and William F. Smith. Administrative Patent Judge Downey was added to this panel for purposes of rendering the decision. Administrative Patent Judge Lorin has been substituted for Administrative Patent Judge Ronald H. Smith, who retired subsequent to the hearing. Legal support for adding additional members to the original panel, without necessity for reargument, can be found in In re Bose Corp., 772 F.2d 866, 227 USPQ 1, 4 (Fed. Cir. 1985). Ex parte Remark, 15 USPQ2d 1498, footnote 1 (Bd. Pat. App & Int.).

⁵ Formerly Examiner-In-Chief (EIC).

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designate all but one (claim 94) of Chu's claims as not corresponding to the count. As a result of granting Beyers' motion, Chu was placed under a show cause order under 37 C.F.R. § 1.640(d)(1). Chu responded to the show cause order (paper no. 135) requesting permission under § 1.615(a) to amend claim 94. The request to amend the claim was dismissed, inter alia, as not timely filed as required by § 1.645(b) and, accordingly, judgment (paper no. 142) was entered against Chu. Qadri v. Chu, 18 USPQ2d 1254 (Bd. Pat. App & Int. 1990).⁶ On appeal, the Board's decision was affirmed (Chu v. Qadri et al. v. Beyers et al. v. Batlogg et al., No. 91-1319 (Fed. Cir. 1992); paper no. 203).

Consequently, this interference now involves:

- Qadri et al. (Qadri) - Serial No. 07/158,483, filed February 22, 1988;⁷

⁶ Batlogg had a similarly "overbroad" claim - claim 16. To be consistent with its decision granting Beyers' motion against Chu, the APJ moved sua sponte for judgment against Batlogg pursuant to 37 C.F.R. § 1.641 on the ground that Batlogg's claim 16 was unpatentable under 35 U.S.C. § 112, first paragraph, for lack of an enabling disclosure for a method of making the claimed superconductors wherein the rare earth element was solely Sc (paper no. 143). A motion pursuant to §§ 1.633(i) and (c) to amend the claim to remove the inoperative species was filed (paper no. 150) and granted (paper no. 155).

⁷ According to Qadri (Preliminary Motions under 37 C.F.R. § 1.633; Motion to Declare An Additional Interference (i.e., Q7); paper no. 39), this application was originally filed with product and process claims. The examiner required a restriction and Qadri elected to prosecute the product claims now in this interference. Qadri indicated that a "divisional application was filed December 30, 1988. . . . The divisional application contains the same process claims as were filed in the parent application 07/158,483." We now learn (Beyers' Motion Under 37 C.F.R. § 1.635 for Judgment Against Qadri under 37 C.F.R. §

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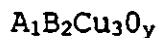
- Beyers et al. (Beyers) - Serial No. 07/024,653, filed March 11, 1987; and
- Batlogg et al. (Batlogg) - Serial No. 07/021,229, filed March 3, 1987.⁸

By virtue of their effective filing date of March 3, 1987, Batlogg et al. are the senior party in this interference, 37 C.F.R. §§ 1.657 and 1.601(m).

Count 1, the sole count at issue, reads as follows:

Count 1

A crystalline essentially single phase composition having a perovskite like structure, exhibiting zero electrical resistance at a temperature of 70⁰ K or higher, having the formula:



wherein A is Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, or mixtures thereof;

B is Ba, Sr, or mixtures thereof; and

y is a value that provides the composition with zero electrical resistance at a temperature of 70⁰ K or above said composition having a purity of at least 90%.

1.616 for Violation of 37 C.F.R. § 1.615; paper no. 245) that a patent (U.S. Patent 5,106,829; issued April 21, 1992) has issued from a continuation application (07/587,466, filed September 19, 1990) of that divisional application (07/292,067).

⁸ Batlogg had also filed a CIP (Serial No. 07/024,046, filed March 10, 1987). However, Batlogg's Motion Under § 1.633(d) (paper no. 48) to substitute the CIP 07/024,046 for the parent 07/021,229 in the interference was denied (paper no. 131). Batlogg does not seek review of the denial of the motion. Matters not raised in the brief are deemed abandoned. Photis v. Lunkenheimer, 225 USPQ 948 (Bd. Pat. Int. 1984).

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The claims of the parties which correspond to this count are:

Qadri et al. : claims 24 and 25
Beyers et al. : claims 1 through 10
Batlogg et al.: claims 1 through 16.

The parties filed the following briefs and reply briefs:

QB⁹ Qadri brief, filed May 22, 1992 (paper no. 216) - -
BeB Beyers brief, filed May 26, 1992 (paper no. 219)
BaB Batlogg brief, filed June 26, 1992 (paper no. 221)
QRB Qadri reply brief, filed July 13, 1992 (paper no. 238)
BeRB Beyers reply brief, filed July 15, 1992 (paper no. 227).

All parties took testimony, filed a record¹⁰ consisting of evidence in the nature of affidavits, testimony, documents and exhibits, and appeared at final hearing represented by counsel.

ISSUES

No issue of no interference-in-fact was raised at final hearing.

⁹ Hereinafter, the briefs and reply briefs will be designated by these abbreviations followed by page number.

¹⁰ References to the Beyers record (paper nos. 208 and 209) will be designated as BeR, followed by page number; references to the Qadri record (paper nos. 206 and 207) will be designated as QR, followed by page number; and references to the Batlogg record (paper nos. 204 and 205) will be designated as BaR, followed by page number.

The issues presented for our decision include the parties' cases for priority, motions, and statements of the issues taken from the parties' briefs.

Motions

Qadri

- QM1 under 37 C.F.R. § 1.656(h) to exclude from evidence Beyers et al. Exhibits Be 34, 35, and 36. (filed May 22, 1992; paper no. 217(1))
- QM2 under 37 C.F.R. § 1.656(h) "to exclude from evidence all testimony by Dr. Stuart S.P. Parkin and Robert B. Beyers relating to magnetization tests of sample 4 and sample 5, and testimony based on these tests, which has been offered into evidence by the Party Beyers et al." (filed May 22, 1992; paper no. 217(2))
- QM3 under 37 C.F.R. § 1.656(h) "to exclude from evidence Exhibit BX13, which has been offered into evidence by the Party Batlogg et al." (filed May 22, 1992; paper no. 217(3))
- QM4 under 37 C.F.R. §§ 1.635 and 1.633(a) for judgment against Batlogg because of the failure to disclose the best mode. (filed July 13, 1992; paper no. 241)

Beyers

- BeM1 under 37 C.F.R. §§ 1.635 and 1.656(h) to suppress evidence by Qadri - Exhibits Q-1 through Q-64 and Q-66 through Q-113. (filed May 26, 1992; paper no. 220(1))
- BeM2 under 37 C.F.R. §§ 1.635 and 1.656(h) to suppress evidence by Batlogg - Exhibits Ba-1 through Ba-18 on various grounds including hearsay, no foundation, incompetent or irrelevant. (filed May 26, 1992; paper no. 220(2))

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BeM3 under 37 C.F.R. § 1.635 for "judgment" against Qadri under 37 C.F.R. § 1.616 for violation of 37 C.F.R. § 1.615. (filed November 23, 1992; paper no. 245)

Batlogg

BaM1 under 37 C.F.R. § 1.633(a) for judgment on grounds that Qadri's claims 24-25 are not patentable to Qadri due to Qadri's inequitable conduct. (filed April 1, 1992; paper no. 195)

BaM2 under 37 C.F.R. §§ 1.635 and 1.656(h) to suppress evidence by Beyers for improperly raising issue of sufficiency of Batlogg's application under 35 U.S.C. § 112, namely - - enablement. (filed June 26, 1992; paper no. 223(1))

BaM3 under 37 C.F.R. §§ 1.635 and 1.656(h) to suppress evidence by Qadri for improperly raising the issue of sufficiency of Batlogg's application under 35 U.S.C. § 112, namely best mode and enablement. (filed June 26, 1992; paper no. 223(2))

BaM4 under 37 C.F.R. § 1.635 to return Beyers' brief. (filed June 26, 1992; paper no. 225)

Statement of the Issues

Qadri's and Bartlogg's statements of the issues are reproduced verbatim from their briefs.

Qadri (QB 1-2)

QI1 What constitutes conception of the count of this interference?

QI1a What structural details of a single phase $\text{Re}(\text{Ba}, \text{Sr})_2\text{Cu}_3\text{O}_x$ material of Tc above 70K are essential to the conception of the count?

QI1b What processing steps are critical to the production of a superconducting compound according to the count?

QI2 Whether the Party Qadri's activities of March 2, 1987, when viewed in light of the inventors previous research, constituted conception of a single phase $\text{ReBa}_2\text{Cu}_3\text{O}_x$ material of Tc above 70K.

- QI3 Whether the Party Qadri was reasonably diligent, from the date of conception, in reducing the invention to practice. is a diligent activity toward reducing the invention to practice.
- QI4 Whether an analysis comparable to neutron diffraction is essential to a reduction to practice of the material according to the count, given the state of knowledge in the art which existed in March and April of 1987.
- QI5 Whether the patent application of Party Batlogg does not constitute constructive reduction to practice as of the filing date because of its failure to contain a written - description of the invention and of the manner and process of making it in such full, clear, and exact terms as to enable any person skilled in the art to make and use it.
- QI6 Whether the patent application of Party Beyers does not constitute constructive reduction to practice as of the filing date because of its failure to contain a written description of the invention and of the manner and process of making it in such full, clear, and exact terms as to enable any person skilled in the art to make and use it.
- QI7 Whether the patent application of Party Batlogg does not constitute constructive reduction to practice as of the filing date because of its failure to set forth the best mode contemplated by the inventor at the time of filing.

Beyers

Batlogg (paper no. 225) has moved (**BaM4**) under 37 C.F.R. § 1.635 to return Beyers' brief, pursuant to § 1.618, since Beyers' brief does not contain a statement of the issues as required by § 1.656.

In their opposition (paper no. 230) to Batlogg's motion, Beyers indicates that:

[I]t should be noted that in many cases the issues cited by the Beyers' brief are substantially the same as those cited by the Batlogg brief, for example, the issue of whether or not

Batlogg conceived the invention, the issue of whether or not Beyers conceived the invention, and the issue of whether or not Batlogg's application teaches how to make the superconductor compositions called for by the count.

When Beyers refers to their "cited issues", they mean aspects of the other parties' cases which they have separately discussed.

Batlogg is unpersuaded (reply; paper no. 237¹¹).

We observe that Beyers does not disagree with the issues as Batlogg and Qadri have formulated them. For example, Batlogg's issue Ba11 (see below) is dealt with at page 6 of Beyers' brief. It would appear that Beyers' "issues" are more collective and responsive in character, as outlined in the Table of Contents of their Brief (p. I; parts V., VI. And VII.). Nevertheless, this is not a "Statement of the Issues" in accordance with 37 C.F.R. § 1.656(b)(4) and therefore we could require Beyers to file a corrected brief.¹² Notwithstanding this deficiency, the Chief Administrative Patent Judge waived the requirement of rule

¹¹ "The fact that the party Batlogg has complied with 37 CFR 1.656, and that there is some overlap between the issues as seen by the party Beyers and the issues as stated by the party Batlogg is totally irrelevant. There clearly is disagreement about the issues. For instance, the party Batlogg's issue A apparently is not considered to be an issue by the party Beyers."

¹² Though we do not have as severe a situation, as a matter of interest, we note that the U.S. Court of Appeals for the Second Circuit, granted sanctions where, contrary to Fed. R. App. P. 28, appellant's main brief did not articulate the issues appellant intended to raise. The Ernst Haas Studio Inc. v. Palm Press Inc., 164 F.3d 110, 112, 49 USPQ2d 1377, 1379 (CA2 1999).

§ 1.656(b)(4) in order to reach a decision in the case without the further delay that would be caused by requiring new briefs (see paper no. 269). In view of the waiver, we will treat Beyers' brief as though it presents the same issues as those of the other parties. The Batlogg motion is therefore moot.

Batlogg (BaB 1-2)

- BaI1 Whether the "90% purity" requirement of the count means that at least 90% of the composition is orthorhombic 1-2-3?
- BaI2 Whether the instant invention can be conceived without having made and tested the composition?
- BaI3 Whether Qadri engaged in inequitable conduct?
- BaI4 Whether Qadri ever conceived the invention?
- BaI5 Whether Beyers conceived the invention prior to March 10, 1987?
- BaI6 Whether Batlogg actually reduced the invention to practice, including whether neutron diffraction is essential to reduction to practice?
- BaI7 Whether Batlogg's involved application teaches how to produce the superconductor composition called for by the count?
- BaI8 Whether Qadri can at this stage in the proceedings raise a "best mode" issue that was not raised by preliminary motion?
- BaI9 Whether the involved Batlogg application meets the "best mode" requirement of 35 U.S.C. § 112?

Summary

The motions and statement of the issues are consolidated in the following manner and will be discussed infra in this order:

COUNT INTERPRETATION

➤ The meaning of the count (BaI1)
PRIORITY

- Requirements for establishing conception of the count (BaI2; QI1(a-b))
- Requirements for establishing reduction to practice of the count (BaI6; QI4)
- Qadri's case for priority
 - ✓ Issues regarding Qadri's conception and diligence in reducing the invention to practice (BaI4; QI2; QI3)
- Beyers case for priority
 - ✓ Issues regarding Beyers' conception (BaI5)
- Batlogg's case for priority
 - ✓ Issues regarding Batlogg's actual reduction to practice (BaI6)

PATENTABILITY

- Whether Batlogg's application complies with the written description requirement of 35 U.S.C. § 112 (QI5)
- Whether Batlogg's application complies with the enablement requirement of 35 U.S.C. § 112 (BaI7; QI5)
 - ✓ BaM2
 - ✓ BaM3
- Whether Batlogg's application complies with the best mode requirement of 35 U.S.C. § 112 (BaI8-9; QI7)
 - ✓ BaM3
 - ✓ QM4
- Whether Beyers' application complies with 35 U.S.C. § 112 (QI6)

OTHER MOTIONS TO EXCLUDE OR SUPPRESS EVIDENCE

- BeM1
- BeM2
- QM1
- QM2
- QM3

- WHETHER QADRI ENGAGED IN INEQUITABLE CONDUCT (BaI3)

- BaM1

WHETHER QADRI VIOLATED § 1.615

- BeM3

COUNT INTERPRETATION

Requirements of the Count

As the count indicates, superconducting compositions of the formula $A_1B_2Cu_3O_y$ are the subject matter of this interference. All three parties acknowledge (BeB, p. 4, lines 10-23; BaB p. 18, lines 15-17; QB p. 19, lines 1-4) that the Chu et al.¹³ discovery of a Y-Ba-Cu-O compound system exhibiting superconductivity above 90°K was an impetus to developing this subject matter. Chu recognized that the Y-Ba-Cu-O system had different phases and that there was a need to further investigate these phases to determine the reason for the superconductivity.¹⁴ The three

¹³ Chu et al., "Superconductivity At 98K In The Y-Ba-Cu-O Compound System At Ambient Pressure", Phys. Rev. Letters, 58, 408 (1987).

¹⁴ "Currently, we are in the process of separating the different phases in YBCO and examining the structural, electrical and magnetic properties of each phase to search for an answer to the question concerning the unusually high T_c in this system." Chu et al., Phys.

parties herein were aware of this in late February 1987 (BaB, p. 18, line 23 [i.e., 2/26/87]; BeB, p. 11, line 4 [i.e., 2/27/87]; QB, p. 18, line 24 [i.e., 2/27/87]) and undertook an immediate investigation. It has since been shown that this composition comprises two phases: a green insulating phase of $Y_2Ba_1CuO_y$ and a black conducting phase of $YBa_2Cu_3O_y$ (BaB, p. 42, lines 20-23; BeB, p. 12, lines 13-22 and p. 13, lines 15-18; QB, pp. 18-20 and specification, p. 4, lines 6-10).

All three parties filed applications to the superconducting material and designated the material as having the general formula $AB_2Cu_3O_y$, now referred to as 1-2-3. Batlogg's application, filed March 3, 1987, discloses and claims (claim 1) a composition having the formula $M_2M'Cu_3O_{9-\delta}$ where δ is at least 1. Beyers' application, filed March 11, 1987, discloses and claims (claim 1) a composition of the formula $A_{1-x}M_{2+x}Cu_3O_y$ where x is between 0 and 0.5 and y is sufficient to satisfy the valence demands (p. 2, lines 8-10). Qadri's application, filed February 22, 1988, discloses and claims (claims 24-25) their superconducting composition as having the general formula $YBa_2Cu_3O_7$ (specification, p. 5, lines 22-23). There is no dispute therefore that all three applications claim and describe the 1-2-3 composition that is the subject matter of this interference.

There is also no dispute that the parties' applications teach the following other properties recited in the count relative the $\text{AB}_2\text{Cu}_3\text{O}_y$ superconductive composition:

- Crystalline
 - Batlogg - p. 4, line 3
 - Beyers - p. 4, line 7
 - Qadri - p. 6, line 8
- Essentially single phase
 - Batlogg - p.5, line 21
 - Beyers - p. 4, line 7
 - Qadri - p. 5, line 4
- Having a perovskite-like structure
 - Batlogg - p. 5, line 27
 - Beyers - p. 4, line 7
 - Qadri - see Figure 2 discussed at p. 7, line 23; compare with similar illustration of "oxygen-defect perovskite $\text{YBa}_2\text{Cu}_3\text{O}_x$ " in Grant et al, "Superconductivity above 90K in the compound $\text{YBa}_2\text{Cu}_3\text{O}_x$: Structural, transport, and magnetic properties", Physical Review B, Vol. 35, Number 13, 1 May 1987, p. 7242 (copy attached to paper no. 40)
- Exhibiting zero electrical resistance at a temperature of 70°K or higher
 - Batlogg - Table at p. 11a, see examples 1 and 3 (measured at, for instance, $T_c R=0$; see discussion at p. 11, lines 18-20)
 - Beyers - p. 4, line 7 (e.g., "demonstrated bulk superconductivity")
 - Qadri - p. 4, line 20 (e.g., "having a transition temperature above 85K")

90% Purity

The last remaining property required by the count is: "having a purity of at least 90%". Unlike the aforementioned properties, this phrase does not appear verbatim in any of the parties' specifications and therefore raises a question of definition. In

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fact, the parties' briefs make interpreting this phrase a threshold issue (BaB 26-29 [BaI1]; BeB 25-29; QB 60-62).

As is usual in interpreting a count, we must give this phrase the broadest reasonable interpretation.

In interpreting count 5 we have followed the well known rule that counts in interference must be given the broadest construction which they will reasonably permit. *Kuchar v. Armington et al.*, 1943 C. D. 283, 30 C.C.P.A. 872, 133 F.2d 944, 56 USPQ 553 [1943].

Collins v. Trumpler, 105 USPQ 341, 345 (Bd. Pat. Int. 1954).

The parties have differing positions on the scope of the phrase and, while this may suggest that the phrase is ambiguous, we find that no ambiguity actually exists. We have considered the arguments in the briefs and, although unnecessary¹⁵, resorted to the specifications in clarifying the scope of the phrase. In doing so, we have determined that Batlogg's interpretation accords with the broadest reasonable interpretation of the count.

Parties' Positions

All the parties agree (BaB paragraph bridging pp. 19-20; BeB 5-6; QB 3-4 and 61-62) that the subject matter of the count - $AB_2Cu_3O_y$ - comes in two crystalline forms, a nonsuperconductive

¹⁵ "Interference counts are given the broadest reasonable interpretation possible, and resort to the specification is necessary only when there are ambiguities inherent in the claim language or obvious from arguments of counsel." DeGeorge v. Bernier, 768 F.2d 1318, 1321-22, 226 USPQ 758, 760-61 (Fed. Cir. 1985).

tetragonal and superconductive orthorhombic form. Furthermore the superconductivity of the orthorhombic form is influenced by the distribution of oxygen in the structure. When the oxygen level corresponds to $y \approx 7.0$ in the 1-2-3 formula, the transition temperature at which the material superconducts is at its highest. The dispute is whether "90% purity" means the composition must be purely an "orthorhombic form" or more particularly the "orthorhombic form where the oxygen content corresponds to $y \approx 7.0$ ".

Beyers' position is that the count requires the oxygen content to correspond to $y \approx 7.0$. Their position is summarized by this statement from their brief (BeB 6):

For purposes of this patent interference, it is especially important to note that only well-ordered, homogeneous samples with oxygen contents between $y = 6.8$ and 7.0 can meet the 90% purity requirement of the count, i.e., at least 90% of the material can sustain zero resistance at 70 K or above.

Qadri's position (QB 61-62) is the same as that of Beyers:

In particular, the invention must be "essentially single phase . . . having a purity of at least 90%." It is submitted that this means "greater than 90% of the sample is capable of exhibiting the property of zero resistance at a temperature of at least . . . 70K" BER 509, ¶6. In other words, at least 90% of the sample must be the Orthorhombic I phase. QR p. 537 ¶ 20. The sample must have the cation stoichiometry of 1:2:3 **and must have the correct oxygen stoichiometry** - about 7. (Qadri's emphasis.)

Beyers and Qadri therefore define the count as containing 90% of a species of orthorhombic $AB_2Cu_3O_y$ where y is approximately 7.0. This is the narrow interpretation of the count.

Batlogg (BaB 29), on the other hand, has a broader interpretation:

[. . .] the count demands that the composition be at least 90% orthorhombic 1-2-3. The oxygen content must be such that the composition has zero electrical resistance at 70°K or above. These conditions can be readily verified by common laboratory techniques, namely x-ray diffraction and resistance measurements. The count could not possibly require that at least 90% of the composition be of the "Ortho I" variety since, inter alia, there exist no readily available techniques for ascertaining existence of this condition, and since there is no support for this interpretation in any of the involved applications.

We can summarize the positions of the parties (i.e., the gray boxes) as follows:

<u>Chu (prior art)</u>	<u>Batlogg</u>	<u>Beyers/Qadri</u>	
$A_2B_1Cu_3O$ green			→ ≠ superconducting
	tetrahedral $y \leq 6.3$		→ ≠ superconducting
$A_1B_2Cu_3O_y$ black	orthorhombic $y=6.4-7.0$	(ortho II) $y=6.4-6.8$	→ superconducting <70°K
		(ortho I) $y=6.9-7.0$	→ superconducting >70°K

Reasons For Broadly Interpreting The Count

As the above chart illustrates, the parties have given the count two different interpretations: for Batlogg, the composition of the count has a generic formula where $y=6.4-7.0$, for Beyers and Qadri, the composition of the count is limited to those of the formula where $y=6.9-7.0$. We have carefully reviewed the parties' arguments and, for the following reasons, we agree with Batlogg that the purity requirement requires only that the composition be at least 90% orthorhombic of a generic formula where $y=6.4-7.0$ and exhibit zero electrical resistance at a temperature of 70° K or above.

First, we agree with Batlogg (BaB 27) that the APJ has previously broadly interpreted "90% purity". The question of count interpretation previously arose during the preliminary motion period. In response to Batlogg's Motion under § 1.633(c)(1) to substitute a proposed count for present Count 1 (paper no. 47), the APJ denied the motion but granted Batlogg's alternative request¹⁶ to find that the count excludes non-superconductive $AB_2Cu_3O_y$ (decision on motions, paper no. 131, pp. 12-13), stating that:

¹⁶ "In the alternative, if the Board finds that the count unambiguously excludes superconductive material of the defined stoichiometry that contains a significant amount of a non-superconducting (tetragonal) phase, it is respectively urged that such a finding be made to appear in the record of this interference." (paper no. 47, p. 6)

[T]he motion to substitute the proposed count is denied because the proposed language "A body comprising a crystalline essentially single phase composition" would appear to include "bodies" with multiple phases due to the open language "comprising" whereas the present count, as noted by Batlogg, is limited to an "essentially single phase composition" which the primary examiner considered to be patentably distinct from the multiple phase materials. However, Batlogg's alternative request is granted to the extent that the undersigned Examiner-in-Chief finds that the count excludes a composition that contains a significant amount of a non-superconducting (tetragonal) phase, i.e., the count is limited to an 'essentially single phase' superconducting composition. Plainly, a composition with a significant amount of a non-superconducting phase, eg., more than 10%, would be outside the scope of the count.

As the above passage indicates, the APJ's focus was on the single-phase characteristic of the interfering subject matter.¹⁷

Multiphase materials with the same superconductive property as required by the count were already known (see Chu et al). They were, in fact, the starting point for the work that eventually became the subject matter of this interference. It follows, therefore, that the count, though requiring the same superconductive property, could not read on the prior art multiphase materials. In the context of clarifying the distinction between single-phase and known multiphase materials,

¹⁷ See the Decision on Motions (paper no. 131). Numerous statements are made contrasting single phase from prior art multi-phase materials. See p. 7: "Indeed, the examiner stated in his office action that the 'present claim language is interpreted as excluding multi-phase materials of the type taught by Chu et al.'" See sentence bridging pp. 14-15: "The count is directed to single phase compositions, which have been found to be patentably distinct from the multiple phase compositions, and, as pointed out by Chu, only claims drawn to the separately patentable single phase compositions should be designated as corresponding to count 1."

the APJ determined that the term corresponded to the proportion of single-phase material in the composition of the count. The APJ made no mention of oxygen levels or Ortho I structures. As long as the composition comprised at least 90% of a single phase exhibiting the stated superconductive property, the APJ held that the composition was at least 90% pure and met the count. The APJ's holding is clear and unambiguous and we find no error in that holding.

Second, we agree with Batlogg (BaB 26-27) that, even if a case could be made that the count is ambiguous, it would have to be construed in light of the originating application.

The applicable law is clear and firmly established. Counts should be given the broadest interpretation which they will reasonably support. The word "reasonably" should not be deleted nor should the language be given an unwarranted overbroad interpretation. *Jepson v. Egly et al.* 1956 C.D. 233, 43 CCPA 853, 231 F.2d 947, 109 USPQ 354; *Jones v. Kuprion*, 1956 C.D. 77, 42 CCPA 1095, 225 F.2d 485, 107 USPQ 9; *Clark v. Camras*, 673 O.G. 305, 204 F.2d 273, 97 USPQ 434. Further, if the language of a count is ambiguous or susceptible of more than one meaning it should be construed in the light of the originating application. *Carter v. Kellgren et al.*, 1948 C.D. 345, 35 CCPA 989, 166 F.2d 592, 77 USPQ 102.

Davidson v. Carpenter, 123 USPQ 171, 174 (Bd. Pat. Int. 1959).

For the following reasons, Batlogg's application is the originating application for purposes of interpreting the count.

All parties agree that development of the subject matter of this interference occurred at a very rapid pace. This is reflected by the three interfering applications. From Batlogg to

Beyers to Qadri, information about the high transition temperature superconducting fraction of the orthorhombic phase is given in progressively more detail. If we are to give the count the broadest reasonable interpretation and the one that is representative of the common subject matter between the interfering applications, Hurwitz v. Poon, 364 F.2d 878, 881, 150 USPQ 676, 678¹⁸ (CCPA 1966), it should be done in light of the application that provides the most generic perspective - and here that is Batlogg's.

Moreover, after reviewing the parties' applications, we observe that, while no application recites "purity", only Batlogg discloses a percentage (spec., p. 5, lines 21-25). As a result, Batlogg's specification provides us with the best guidance for interpreting the count. The most relevant statements that Batlogg makes are these:

Materials of the invention are essentially single phase. By this it is meant that the materials herein are single phase 95 mole percent as determined by powder x-ray diffraction. The particular value, 95 percent, is chosen as corresponding with the expected measurement precision of ordinary apparatus-procedures.

Since this passage suggests that the purity of the superconductive material is determined by the single phase amount, it is

¹⁸ "Our review of the applications convinces us that the inventions of the two parties are indeed the same, and that the examiner, in proposing a count that was representative of the common subject matter, chose what was to be taken as a reasonably generic term to cover the various resins. It is not inconsistent that a generic term form the basis of a common count while the

consistent with the APJ's earlier determination and therefore lends further support to a broad interpretation of the count.

Finally, we find that the interpretations Beyers and Qadri are advocating - that the material of the count must have at least 90% of a $AB_2Cu_3O_y$, where y is around 7.0 - amounts to reading a limitation into the count. We have carefully reviewed the junior parties' positions but find that they adopt a species of the count to represent the entire count.

Beyers' does not support their position with reference to their specification. In fact, after reviewing the Beyers' specification, we could find no reference to purity, a percentage, the oxygen level corresponding to $y \approx 7.0$, or the well-ordered homogeneous material that that oxygen level creates. Instead, Beyers discusses (BeB 6-7) something that their specification clearly teaches (p. 2, lines 21-24): a step of slow cooling. Apparently this processing step produces, inherently, the well-ordered homogeneous sample with oxygen contents between $y = 6.8$ and 7.0 that Beyers argues is the subject matter of the count. In other words, the "purity" phrase of the count is not being interpreted by reference to a definition in the specification but rather equated with a consistently-uniform high transition-temperature superconductive material that Beyers would produce by following the process set forth in their application.

parties each resort to somewhat different Markush terminology."

However, while Beyers may be describing a material which is desirable, the count does not require it. A material that is, for example consistently uniform, is nowhere mentioned in the count. To read such a limitation into the count would, in our view, unreasonably narrow the count. Since "limitations not clearly included in a count should not be read into it", Kroekel v. Shah, 558 F.2d 29, 32, 194 USPQ 544, 547 (CCPA 1977), we do not read the count as exclusively directed to a species of $AB_2Cu_3O_y$ where the oxygen level corresponds to $y \approx 7.0$.

Like Beyers, Qadri's specification does not mention "purity" or a percentage and therefore cannot be relied upon for an explicit interpretation of the count's "purity" language. Instead, Qadri's specification teaches (e.g., p. 5, line 23) a composition with an oxygen stoichiometry corresponding to $y=7.0$ and emphasizes (p. 13) slow cooling, among other processing steps, (e.g., multiple grinding), as critical for producing that composition. Qadri provides the most detailed description of $A_1B_2Cu_3O_7$. Nevertheless, like Beyers, this information does not assist us in interpreting the count but rather provides us with insight into the behavior of $AB_2Cu_3O_y$ -based materials. Qadri's discussion (QB 12-15) on the matter follows a line of argument similar to Beyers'. Given their disclosure, Qadri defines "purity" as the amount of $AB_2Cu_3O_7$ because only material of that

formula can exhibit the stated superconductivity. Qadri states that species not performing as stated are "impurities" (QRB 3). Therefore, according to Qadri, the composition of the count cannot contain any more than 10% of these impurities. In other words, like Beyers, Qadri is interpreting the count as though it required the material to contain at least 90% of a consistently uniform $A_1B_2Cu_3O_7$ phase. We do not agree. The count requires that the composition contain at least 90% of a single superconducting phase which exhibits the stated superconductive property. It does not require that 90% of the composition must exhibit this property uniformly, consistently or homogeneously. It need only be superconductive and exhibit the stated property. This broad interpretation is reasonable. "[T]he broadest interpretation is always applicable so long as it is reasonable," DeGeorge v. Bernier, 768 F.2d at 1321, 226 USPQ at 761.

We understand the junior parties' concern that the broad interpretation we are giving the count invites the possibility that the count reads on, for example, samples with a thin surface layer of $A_1B_2Cu_3O_7$ surrounding an oxygen-poor interior (BeB 7) or a composition with more than 10% of Ortho II (QRB 6). Whether these or other species are included in the count depends not on the amount or distribution of $A_1B_2Cu_3O_7$ in the composition but on their capacity to exhibit zero resistance at 70K or above and contain at least 90% of $AB_2Cu_3O_y$; at least 90% of the composition

must be the single phase orthorhombic form and exhibit the stated superconductivity. By emphasizing the homogeneity of their material, the junior parties would appear to be distinguishing their species from other less desirable ones. However, the fact that a species may perform better or even excel is not a reasonable basis for narrowly construing the count.¹⁹

We give the count Batlogg's broad interpretation. Having resolved the threshold issue of count interpretation, we now turn to the question of priority.

PRIORITY

In their cases for priority, Beyers and Qadri, as the junior parties, must establish that they actually reduced to practice the invention of the count before March 3, 1987, Batlogg's filing date, or that they first conceived the invention prior to that date and proceeded with diligence from a time just prior to the opponent entering the field toward a reduction to practice, either actual or constructive. Haskell v. Colebourne, 671 F.2d 1362, 1365, 213 USPQ 192, 194 (CCPA 1982). Junior parties have the burden of establishing priority by a preponderance of the evidence. 37 C.F.R. § 1.657(b). Bosies v. Benedict, 27 F.3d 539,

¹⁹ We reiterate our earlier point that the count is unambiguous. It is not made more so by reading on materials of varying degrees of homogeneity. "Broad language in a count is not ambiguous simply because it is capable of being read on several embodiments." Fontijn v. Okamoto, 518 F.610, 618, 186 USPQ 97, 104 (CCPA 1975).

30 USPQ2d 1862 (Fed. Cir. 1994). Parties have raised issues regarding what is required to show conception and actual reduction to practice.

Requirements For Establishing Conception Of The Count

Qadri raises two issues (QI1: QI1a; QI1b) to be considered in determining whether a party has established conception in their case for priority: 1) what structural details of the superconductor composition are essential; and 2) what processing steps are critical in making that composition. With respect to the first issue, Qadri (QB 55) argues that conception "does not require that every limitation in the counts must be exactly foreseen," Vanderkooi v. Hoeschele, 7 USPQ2d 1253, 1255 (Bd.Pat. App. & Int. 1987). It is, Qadri argues, sufficient to have developed a master plan and research results which would have inevitably led to a reduction of the count (citing Lazo v. Tso, 480 F.2d 908, 178 USPQ 361 (CCPA 1973). With respect to the second issue, Qadri argues that, in establishing conception, "[o]ne must also know how to properly process the necessary starting oxides" and indicates that proper calcination of the starting materials (QB 53) and oxidation of the sintered material (QB 51) are critical processing steps.

Batlogg (BaI2) also discusses the applicable standard for conception, arguing that "conception of the instant invention

requires not only possession of the chemical formula of the composition (e.g., possession of the formula $\text{YBa}_2\text{Cu}_3\text{O}_x$) but also experimental verification that the composition is at least 90% orthorhombic $\text{YBa}_2\text{Cu}_3\text{O}_x$ and has $R=0$ at 70K or above." BaB 30-31.

"Conception is established by showing 'the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice * * *.'" Rebstock v. Flouret, 191 USPQ 342, 344 (Bd. Pat.Int. 1975). While every element of the count need not be conceived, as Qadri indicates, the disclosure should provide enough information to yield the composition without extensive experimentation.

[T]he law does not require that every element of the counts be conceived; rather, the test of conception is whether the disclosure by the inventor(s) was such that no extensive research or experimentation would be required for one of ordinary skill in the art to construct the invention in issue based upon that disclosure.

Vancil v. Arata, 202 USPQ 58, 60 (Bd.Pat.Int. 1977). Under this test, therefore, any determination of whether the parties conceived the composition of the count will depend on whether any elements of the composition were not conceived and extensive experimentation would be required to construct it. We need not seek out elements of the composition which are not recited in the count. Ortho I, which Qadri argues in favor of, is not required by the composition of the count and therefore we need not

determine if extensive experimentation would be required to construct it. On the other hand, Qadri might establish conception of the count through their conception of the Ortho I structure because "conception of a species within a genus may constitute conception of the genus," Oka v. Youssefye, 849 F.2d 581, 583, 7 USPQ2d 1169, 1171 (Fed. Cir. 1988). Either way, at the very least, the count requires a composition of the formula $AB_2Cu_3O_y$. Parties must show conception of this formula and explain how this can be constructed without extensive experimentation. At a minimum, conception must be shown for a composition that is at least 90% orthorhombic $YBa_2Cu_3O_y$ and has electrical resistance (R) $R=0$ at 70K or above.

Furthermore, as Qadri indicates, conception requires possession of an operative method of making the invention. Coleman v. Dines, 754 F.2d 353, 359, 224 USPQ 857, 862 (Fed. Cir. 1985); Taub v. Rauser, 145 USPQ 497, 499²⁰ (Bd.Pat.Int. 1964). But, here again, the method of making need only be commensurate with an embodiment of the count. Conception of the count does not require an appreciation of a process to make an Ortho I composition. However, parties must possess a process that makes the composition of the count as we have broadly construed it.

²⁰ "Conception must include, not only a mental possession of the desired end result, in this case a chemical compound and its use, but the mental possession of an operative process and, if necessary, of means of carrying the invention out, that is, the preparation of the compound, Alpert v. Slatin, 49 CCPA 1343, 134 USPQ 296, 305 F.2d 891,

Regarding whether a party must have experimental verification that their composition is at least 90% orthorhombic $\text{YBa}_2\text{Cu}_3\text{O}_x$ and has $R=0$ at 70K or above, we do not see this as a requirement for establishing conception. While this information can help demonstrate conception to show that a party had defined their invention, a party is not limited to this sort of evidence. "[C]onception of a chemical compound requires that the inventor be able to define it so as to distinguish it from other materials," Amgen v. Chugai, 927 F.2d 1200, 1206, 18 USPQ2d 1016, 1021 (Fed. Cir.), cert. denied 502 US 856 (1991). Experimental verification is not the only mode for defining a chemical compound. In some instances, like the one Batlogg (BaB 24, paragraph 12.) urges with respect to their invention, conception is established when a party has reduced the invention to practice through a successful experiment; i.e., simultaneous conception and reduction to practice. Id. at 1021. The determining factor in establishing conception of the count is not whether a party has verified what they have produced or that they simultaneously reduced to practice the compound they conceived, but whether "one has a mental picture of the structure of the chemical, or is able to define it by its method of preparation, its physical or chemical properties, or whatever characteristics sufficiently distinguish it." Ibid.

and Cislak v. Wagner, 42 CCPA 701, 103 USPQ 39, 215 F.2d 275."

Requirements For Establishing Reduction To Practice Of The Count

Qadri raises an issue (QI4) to be considered in determining whether a party has established reduction to practice in their case for priority: whether a neutron diffraction-type analysis is essential. Qadri (QB 57) argues that:

[N]eutron diffraction, because of its ability to 'see' oxygen atoms among heavier elements could distinguish between Ortho I, Ortho II, Tetragonal and other impurity phases and determine the purity of an Ortho I material. . . . Therefore, in March and April 1987, reduction of the count to practice could not be established without neutron diffraction data.

Qadri (QRB 13-16) points out that "[N]eutron data is needed only to establish that a sample to be used as a standard for x-ray analysis is actually pure Ortho I."

We have carefully considered Qadri's argument but agree with Batlogg (BaI6; BaB 50-51) that neutron diffraction is not required. We base our reasoning on our construction of the count. Since the count does not require a composition consisting of Ortho I material, a test to establish the fraction of Ortho I would not be required. It is only required that the parties reduce to practice the composition of the count.

The Cases For Priority

Alleged Dates Of Conception And Reduction To Practice

Having analyzed the requirements for conception and reduction to practice in light of the parties' arguments, we now turn to the parties' briefs to determine what dates of conception and reduction to practice they believe they are entitled to. We reproduce the following statements in this regard:

Qadri: "A. NRL conceived of the invention on March 2, 1987." QB 40, line 3. "B. The Party Qadri reduced the invention to practice sometime during the period of April 6, 1987 to April 10, 1987." QB 55, line 19-21. "C. The party Qadri was reasonably diligent, from March 2, 1987 until reduction to practice." QB 57, lines 15-16.

Beyers: "It is submitted that the above section of this brief proves conclusively that the party Beyers et al had a complete, corroborated conception of the invention by the morning of March 3, 1987, and with all possible diligence actually reduced to practice with corroboration no later than March 6, 1987." BeB 24, lines 7-12.

Batlogg: "13. Thus, by the evening of Sunday, March 1, 1987 Cava et al. clearly had conceived and simultaneously reduced to practice the invention as defined by the count (see, for instance

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BaR p.257, ¶ 17). Corroboration is provided" BaB 16-18.

"As described in detail in section VI above, Batlogg had achieved simultaneous conception and reduction to practice on the evening of March 1, 1987. . . ." BaB 46, lines 3-4.

The parties therefore allege the following dates of conception and reduction to practice with the proper diligence from conception to reduction to practice:

Qadri:

Conception - March 2, 1987

Reduction to Practice - sometime during the period of April 6-10, 1987

Beyers:

Conception - March 3, 1987

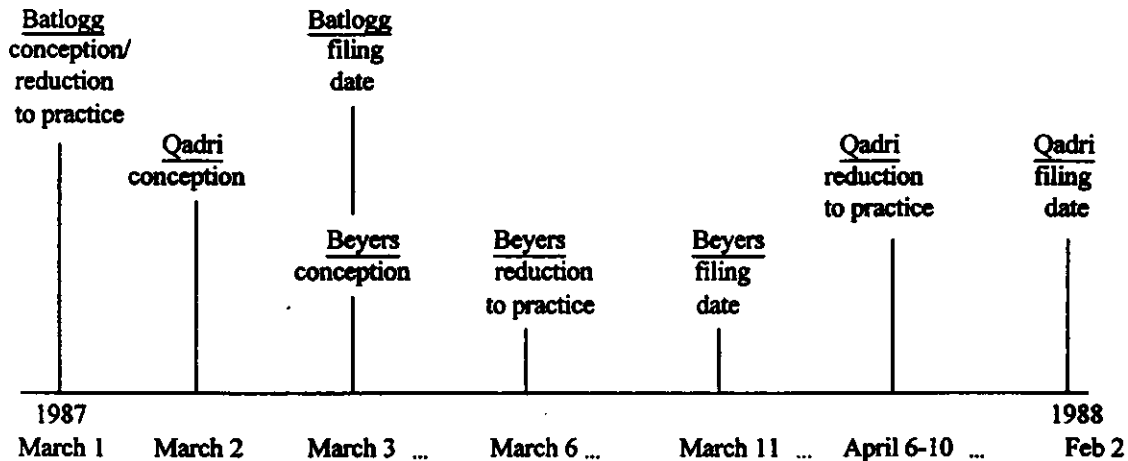
Reduction to Practice - March 6, 1987

Batlogg:

Conception - March 1, 1987

Reduction to Practice - March 1, 1987

Based on these alleged dates, we construct the following timeline:



Qadri's Case For Priority

We have reviewed the parties' issues regarding Qadri's conception and diligence in reducing the invention to practice (BaI4; QI2; QI3) and conclude that Qadri has not established conception as of March 2, 1987.

Qadri, as a junior party to this interference, has the burden of proving prior invention by a preponderance of the evidence. 37 C.F.R. § 1.657(b). In an effort to sustain their burden, Qadri relies on an extensive evidentiary record. Qadri argues that they conceived of the invention on March 2, 1987 (QB 40-55), reduced the invention to practice during the period of April 6, 1987 to April 10, 1987 (QB 55-57), and was reasonably diligent from March 2, 1987 until reduction to practice (QB 57-59).

In support of their position that Qadri established conception of the invention of the count by March 2, 1987, Qadri does not point to evidence to establish that the purported March 2, 1987 conception met all the limitations of the count. Rather, Qadri contends that conception does not require that every limitation in the count must be exactly foreseen, citing Vanderkooi v. Hoeschele, 7 USPQ2d at 1255. Qadri urges that conception can be established if the knowledge of the inventor was such that no extensive research or experimentation would be required, or if the inventors' planned activity would have inevitably resulted in the reduction to practice of the invention if carried out by a person skilled in the art, citing Vanderkooi, supra, and Lazo, supra.

We disagree with Qadri's reliance on Vanderkooi for the proposition that conception does not require that every limitation in the count must be foreseen. It is misplaced in our view. The issue in Vanderkooi was not whether the party Hoeschele supported every limitation of the count. Rather, the issue was inventorship, i.e., was Dr. Hoeschele, who conceived of the specific function for the sodium salt of dimer acid, i.e., as a nucleating agent for polyesters, a sole inventor? Or did the activity of Deyrup and Garrison in determining the suitable range of values amount to an inventive contribution? Similarly, Qadri's reliance on Lazo is misplaced. As noted by Batlogg, Tso was in possession of the

conception of a species within the count before Lazo entered the field, and the research plan only involved testing of that and other species.

Qadri, nevertheless, points to knowledge the Qadri inventors had acquired by March 2, 1987. They recognized the oxygen sensitivity of the superconducting material (QR 82, Qadri Exhibit 2, page 43). By March 3, 1987 they recognized rather "strong diffraction peaks at about 32 degrees" in superconducting sample 176 (QR 83, paragraph 40). Qadri points out, on page 47 of their brief, that from "March 2 until reduction to practice, all samples prepared by the Party Qadri for x-ray analysis and resistivity testing contained ... either 40% Cu or 50% Cu." Qadri presents attorney argument that, as of March 2, 1987, the "Party Qadri had sufficient knowledge to enable a person skilled in the art to make and use the claimed invention without extensive research and experimentation." However, Qadri does not explain why all the activities which occurred did not constitute extensive experimentation. In fact, it appears that the party Qadri had no knowledge of the exact stoichiometry until the APS meeting of March 18, 1987 (QR 194, 195). Had that information not been made available at that time, it is likely that party Qadri would have conducted further experimentation. Considering that it took 16 days and the assistance of a discussion with a participant at the APS meeting to discover the formula, it is reasonable to conclude

that a lack of conception of the formula was tantamount to a lack of conception of the composition of the count.

Conception is the "formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention as it is hereafter to be applied in practice."

Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1376, 231 USPQ 81, 87 (Fed. Cir. 1986). The invention of the count at issue is a chemical composition having, inter alia, the formula $A_1B_2Cu_3O_y$. We find no evidence that Qadri was in possession of the formula of the composition of the count, i.e., the 1:2:3 stoichiometry, by March 2, 1987. Indeed, we find no evidence that Qadri was in possession of the 1:2:3 stoichiometry prior to March 18, 1987 (QR 60, paragraph 32, 194-195, Q7, sample number 221). Accordingly, Qadri has not established conception by March 2, 1987.

We hold that Qadri has failed to establish by a preponderance of the evidence a conception of the invention of Count 1 by March 2, 1987. Accordingly, Qadri's case for prior conception coupled with reasonable diligence from March 2, 1987 until their reduction to practice during the period of April 6 to April 10, 1987 has not been established.

Beyers' Case For Priority

We have reviewed the issues (BaI5) regarding Beyers' conception and find that Beyers cannot establish a date of conception prior to Batlogg's date of constructive reduction to practice.

Beyers alleges a date of conception that is not earlier than any date Batlogg alleges for their conception or reduction to practice, actual or constructive. If Batlogg is entitled to the subject matter of the count, Beyers cannot prevail. Batlogg,

as the senior party, is presumptively entitled to an award of priority, and [Beyers], as the junior party in an interference between pending applications, must overcome the presumption by a preponderance of the evidence. *Morgan v. Hirsch*, 728 F.2d 1449, 1451, 221 USPQ 193, 194 (Fed. Cir. 1984); 37 CFR §1.275(a) (1983). In the event of a tie, therefore, priority must be awarded to the senior party.

Oka v. Youssefyeh, 849 F.2d at 584, 7 USPQ2d at 1172.

Notwithstanding Batlogg's alleged earlier actual reduction to practice, Batlogg, without further proof, could have at least relied on their filing date as their date of constructive reduction to practice. As the CCPA has stated in Nolop v. Smith, 36 F.2d 838, 839, 4 USPQ 316, 318 (CCPA 1930):

. . . we are not at liberty to [ignore the dates set out in the preliminary statement], except as to allowing an earlier date of constructive reduction to practice. Upon this question we agree with the Commissioner that appellant is entitled to the date of filing of her application, Feb. 19, 1924, for a constructive reduction to practice. This was permissible because the records of the Patent Office show that as a matter of law she was entitled to that date, and no proof was

necessary to establish it, and no other date could have been set up so far as constructive reduction to practice was concerned.

Therefore, even if Beyers could establish conception with subsequent reduction to practice, at best their earliest date - March 3 - falls on the same day as Batlogg's constructive reduction to practice. Under these circumstances (i.e., "a tie"), Batlogg is the presumptive first inventor.

We find, therefore, that the junior parties have not proved prior invention by a preponderance of the evidence and that Batlogg is the presumptive first inventor.

Batlogg's Case For Priority

Our finding that Batlogg is the presumptive first inventor is predicated on Batlogg being entitled to constructive reduction to practice of the invention of the count as of the filing date of their application. Otherwise, we would have to determine whether Batlogg is entitled to their date of simultaneous conception and actual reduction to practice. By relying on Batlogg's filing date, we are in effect presuming Batlogg is entitled to claim the subject matter of the count. However, that very issue - whether Batlogg's claims corresponding to the count in the interference are patentable to Batlogg and therefore entitled to constructive reduction to practice of the invention

of the count as of their filing date - is raised by the junior parties by way of both motion and issue in their briefs; albeit, Batlogg has filed motions to suppress the evidence put forward by the junior parties to support their positions regarding the sufficiency of Batlogg's patent application. We explore this issue below and for reasons we detail infra, we hold that Batlogg is indeed entitled to constructive reduction to practice as of March 3, 1987. Consequently, this eliminates the need to consider whether Batlogg had actually reduced their invention to practice.

PATENTABILITY

In this section, we review the question of patentability raised by the junior parties. As we have stated, Batlogg is entitled to priority based on their constructive reduction to practice as of the filing date of their application but only if they are entitled to a patent with at least one patentable claim corresponding to the count. Before discussing the question of patentability, and specifically with respect to whether Batlogg has complied with the provisions of the first paragraph of 35 U.S.C. § 112, we make the following comments.

The movants bear the burden of proof with respect to the motions for judgment on the ground that Batlogg's claims

corresponding to the count are unpatentable to Batlogg. Behr v. Talbott, 27 USPQ2d 1401, 1405 (Bd. Pat. App. & Int 1992).

We direct our attention to Batlogg's claim 16. Batlogg does not seek review of the APJ's decision holding that claims 1-15 are unpatentable to Batlogg.²¹ Photis v. Lunkenheimer, 225 USPQ 948 (Bd. Pat.Int. 1984). Consequently, Batlogg is not entitled to claims 1-15 corresponding to the count.

We do not direct our attention to the count. In various statements²² made in the briefs, the junior parties look variously

²¹ See paper no. 131, pp. 6-7, wherein the APJ stated:
". . . Batlogg does admit on page 14 of his opposition [to Chu's motion under 1.633(a) for judgment (paper no. 60) on the ground that Batlogg's claims 1-16 corresponding to the count are unpatentable to Batlogg] that he learned of Chu's disclosure of high temperature superconductivity in the Y-Ba-Cu-O system on February 27, 1987, prior to any date alleged in Batlogg's preliminary statement. Moreover, Batlogg presents no argument that his claims 1-15, which read on multiphase systems, are patentable over his admitted knowledge of Chu's prior work; rather, his opposition only urges that 'at least claim 16' drawn to single phase compositions is patentable to Batlogg. Accordingly, [Chu's] motion is granted to the extent that claims 1-15 are unpatentable over the admitted prior knowledge of Chu's work, and the final decision in this interference will so indicate."

²² Qadri (QB 62-3) frames one of Batlogg's patentability problems like this: "... the invention according to the count for yttrium-barium-cuprate is essentially pure Orthorhombic I. ... the application does not describe the invention with sufficient detail...". In another instance, with respect to Beyers, Qadri (QB 76) states that "[N]ot only does the application fail to characterize the subject matter of the invention... it also does not specify tests ... [to] determine whether it satisfies the limitations of the claims and the count." Beyers does likewise. Under a section entitled "The Batlogg Application Fails To Meet The Requirements of 35 U.S.C. § 112" (BeB 42), Beyers states: "In its preliminary motions, Beyers alleged that when the teachings of the Batlogg application are followed the product does not meet the requirements of the count...". Actually, Beyers' preliminary motions (paper no. 29) look to Batlogg's claims, not the count: "The party Beyers, et al hereby moves for judgment against the party Batlogg, et

at the count and/or the claims and therefore confuse the issue. Further consideration of patentability in this interference proceeding requires us to direct our attention only to the claims and not to the count. In re Van Geuns, 788 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993). The question of patentability is therefore restricted to Batlogg's claim 16.

We direct our attention to three patentability issues, all under the first paragraph of 35 U.S.C. § 112:

1. written description;
2. enablement; and,
3. best mode.

These three issues are raised in Beyers' and Qadri's briefs, and in their relevant motions. They are raised, however, in a confusing manner.

During the preliminary motion period, Beyers (paper no. 29) moved for judgment against Batlogg on the grounds that Batlogg's claims corresponding to the count were not patentable to Batlogg on three independent grounds: first, that Batlogg discloses an incorrect tetragonal structure for their superconducting material and therefore fails to meet the "description" and "enabling" requirements of Section 112; second, Batlogg fails to disclose the essential step of slow cooling and therefore fails to meet the enabling requirement; and, third, Batlogg failed to provide

al on the grounds that Batlogg, et al's claims corresponding to the

information consonant with the duties required under 37 CFR § 1.56. Beyers therefore has raised the written description (i.e., incorrect tetragonal structure) and the enablement (i.e., incorrect tetragonal structure and no slow cooling) issues with respect to Batlogg's application during the preliminary motion period.

Beyers' brief (BeB 42-46), however, vaguely states that Batlogg "fails to meet the requirements of 35 USC 112". We are never told which requirement Batlogg fails to meet. Beyers (BeB 46) raises three grounds: Batlogg's failure to teach the slow cooling step which is the same ground as was presented in their preliminary motion; Batlogg's mischaracterized tetragonal structure which, since it is discussed (BeB 43) only in the context of enablement²³, is not the same ground as was presented in their preliminary motion with respect to written description; and, newly added grounds that Batlogg's conclusions were reached by using commingled data. Since Beyers' brief does not discuss the one ground (i.e., Batlogg misdescribes the tetragonal structure) that Beyers' preliminary motion used to support raising the

count in the interference are not patentable to Batlogg, et al."

²³ The mischaracterization is mentioned in Beyers' brief but is cast purely in terms of evidence demonstrating nonenablement. Beyers brief states (BeB 44-45) that "another fatal defect in the Batlogg application ... is the statement therein ... that the compositions are tetragonal ... the party Batlogg, et al. have misdescribed the compositions ... the failure to enable, (i.e., to teach slow cooling) inevitably leads to the failure to describe compositions that meet the count." See also Beyers' brief at 42-43 where the issue of structure

written description issue, we read Beyers' brief as directed solely to the enablement requirement. We note that Beyers does not explicitly request a review of their preliminary motion but by raising the enablement issue in their brief, we presume that is what Beyers intended.

Qadri (paper no. 39) moved for judgment against Batlogg on two patentability issues: enablement (motion Q5) and best mode (motion Q6). With respect to preliminary motion Q5, Qadri (p. 13) states that, among other grounds, Qadri "joins in the two grounds based on failure to meet the requirements of 35 USC §112". The two grounds are Batloggs' disclosure of a misdescribed crystalline structure and lack of disclosure to a teaching of slow cooling. Qadri, however, never mentions the written description requirement. In fact, Qadri (p. 3) entitled the motion as a motion "for judgment ... because Batlogg application ... does not contain an enabling disclosure...". Furthermore, in the decision on motions, the APJ (paper no. 131, p. 2) described motion Q5 as a motion for judgment "on the ground that 'the count' is not patentable to Batlogg under 35 USC 112 (nonenablement)...," not on the ground of a lack of written description. All indications are that Qadri moved for judgment on nonenablement grounds, and not on written description grounds. We therefore read Qadri's preliminary motion Q5 as directed solely to the nonenablement issue.

is subsumed in a discussion of making a 90% pure superconductor.

Qadri's brief is clear in raising best mode, written description and enablement issues, and seeking review of their preliminary motions. Qadri has also filed a belated motion for judgment against Batlogg for failing to disclose a best mode (paper no. 241).

We have therefore determined that:

1. The written description issue is discussed in Qadri's brief (QB 62-66); was the subject of Beyers' Preliminary Motion (#1, paper no. 29, pp. 1-2; denied (paper no. 131)); and Beyers does not seek review of the denial of that motion;
2. The enablement issue is discussed in Qadri's (QB 66-74) and Beyers' (BeB 42-46) briefs; was the subject of Beyers' Preliminary Motion (#2, paper no. 29, pp. 2-3; denied (paper no. 131)), the denial of which Beyers, implicitly, now seeks review; and was the subject of Qadri's Preliminary Motion (Q5, paper no. 39, p. 6; denied (paper no. 131)), the denial of which Qadri explicitly seeks review.
3. The best mode issue is discussed in Qadri's brief (QB 88-92) but not in Beyers' brief. It was the subject of Qadri's Preliminary Motion (Q6, paper no. 39; denied (paper no. 131)), the denial of which Qadri seeks review, and is now also the subject of a belated motion (QM4).

We now discuss these issues in light of the arguments in the briefs and relevant motions.

**Whether Batlogg's Application Complies With The Written
Description Requirement of 35 U.S.C. § 112**

Qadri has raised an issue (QI5; QB 62²⁴-66) with respect to Batlogg's compliance with the written description requirement of 35 U.S.C. § 112. Because Qadri never filed a motion for judgment on the grounds that Batlogg's claims were unpatentable under 35 USC 112, for lack of written description, Qadri is not entitled to consideration of this issue at final hearing. 37 C.F.R. § 1.655(b). Qadri could have raised the written description issue by preliminary motion but elected not to do so. Qadri does not explain why it was not properly raised by a timely filed motion for judgment for lack of a written description and why it should now be considered instead. Nor do they argue that their failure to raise the issue was for "good cause." As a result, we do not consider Qadri's argument on whether Batlogg complies with the written description requirement of 35 U.S.C. § 112. Credle v. Bond, 25 F.3d 1566, 1572 fn14, 30 USPQ2d 1911, fn14 (Fed. Cir. 1994).

²⁴ "A. Party Batlogg's Patent Application . . . Fails to Contain a Written Description of the Invention".

Beyers does not seek review of their motion for judgment on the independent ground of a lack of written description.

Whether Batlogg's Application Complies With The Enablement Requirement of 35 U.S.C. § 112

Both junior parties raise an issue with respect to Batlogg's compliance with the enablement requirement. The enablement issue was previously raised in two Preliminary Motions under 37 C.F.R. § 1.633: Beyers (#2, paper no. 29, pp. 2-3) and Qadri (Q5, paper no. 39, p. 6); both of which were denied by the APJ (paper no. 131). We discuss Beyers first.

BEYERS

Beyers (BeB 42-44) acknowledges that they are raising an issue which was the subject of a previous preliminary motion. However, they fail to state that the motion was denied and do not request review of that denial. We presume that, by resurrecting the issue, Beyers is implicitly seeking review of the denial of that motion. We will assume *arguendo* that this is the case.

On the substantive issue here under review, while stating that Batlogg's application fails to meet the requirements of 35 U.S.C. § 112, Beyers never clearly states which provision has not been met. In fact, after reviewing the brief (BeB 42-46), we were unable to find any statement of the issues; no reason or standard is articulated. Beyers (BeB 46) does however argue that

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Batlogg 1) fails to teach the essential step of slow cooling; 2) misdescribes the crystalline structure of their composition; and, 3) contains teachings of a single sample that are based on commingling of data from at least two samples.

Beyers has the burden of showing by a preponderance of the evidence that Batlogg's claim 16 is unpatentable for failing to meet the enablement requirement of 35 U.S.C. § 112. They must demonstrate that there is a reason to doubt that the process set forth in Batlogg can make the composition of Batlogg's claim 16. In re Marzocchi, 439 F.2d 220, 223, 169 USPQ 367, 369 (CCPA 1971). Beyers has failed to do this.

We are not persuaded by Beyers' arguments. We find that Beyers is focusing on their interpretation of the count rather than on Batlogg's claim 16. On the issue of crystalline structure, Beyers (BeB 42) states that "it is necessary (but not sufficient) to have an orthorhombic crystal structure to meet the count." However, the issue is not whether Batlogg enables the count but whether they enable their claim 16. In fact, when looking only at Batlogg's claim, Beyers appears to agree that enablement exists. On the issue of "slow cooling", Beyers (BeR 31) states that: "[p]assive oven cooling, i.e., merely turning the oven off and allowing the samples to cool, may yield an 'acceptable' end result if all it is that one desires is to make a composition that is 90% orthorhombic." Since this is all that

Batlogg's claim 16 requires, Beyers would agree that a lack of disclosure of a "slow cooling" step, or a more specific crystal structure, does not suggest that one cannot make the composition of claim 16.

Beyers (BeB 25-27) also directs our attention to samples which were prepared according to Batlogg's specification (only difference was that some were slow cooled to improve homogeneity). All were $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$. Since this is what Batlogg's claim 16 covers, Beyers' experiments demonstrate that one with skill in this art can make Batlogg's claimed composition.

Beyers has not, therefore, raised any doubts about the objective truth of the manufacturing process Batlogg discloses in their application and therefore have not met their burden. As a result, we find that Batlogg complies with the enablement provision of 35 U.S.C. § 112 and agree with the APJ's denial of the preliminary motion on this issue.

QADRI

Qadri raised the enablement issue in a motion timely filed under 37 C.F.R. § 1.633, which was denied, 37 C.F.R. § 1.655(b).

Qadri (QB 73-74) requests review of the denial of their Preliminary Motion in view of 1) rebuttal evidence (QR 550-5) they have presented to contradict Batlogg's evidence from O'Bryan (BaR 521-25) showing that if one followed the teachings of the

specification, they could obtain successful results, and 2) the facts underlying the APJ's basis for denying the motion have now changed. Good cause has therefore been shown why additional grounds for raising the enablement issue was not previously raised.

Qadri has the burden of showing by a preponderance of the evidence that Batlogg's claim 16 is unpatentable for failing to meet the enablement requirement of 35 U.S.C. § 112. The burden is on Qadri to establish that they are entitled to the relief requested. Kubota v. Shibuya, 999 F.2d 517, 27 USPQ2d 1418 (Fed. Cir. 1993).

In their preliminary motion (paper no. 39, pp. 13-14) with respect to this issue, Qadri set forth the following grounds:

- Batlogg discloses an incorrect crystalline structure (i.e., tetragonal) for the material (taken from Beyers' preliminary motion - "First Ground", paper no. 29, pp. 1-2);
- Batlogg fails to disclose the essential step of slow cooling (taken from Beyers' preliminary motion - "Second Ground", paper no. 29, pp. 2-3);
- "Batlogg does not teach how to make and use the superconducting composition as opposed to nonsuperconducting material." (p. 14); and,
- "Batlogg does not include and data ... specifically identifying the compositions which are superconducting." (p. 14).

Of the grounds set forth in their preliminary motion, only "slow cooling" is discussed in their brief. Therefore, we do not consider the other grounds in our review of Qadri's motion and the APJ's denial of that motion.

We have reviewed the evidence but Qadri has not sustained their burden and therefore we find no error in the APJ's denial. With respect to "slow cooling", Qadri deems it critical to producing the material. Batlogg (BaB 51-52) appears to agree that they do not teach slow cooling but state that "[t]here is no need to 'affirmatively control the temperature drop'." There is therefore a dispute as to whether slow cooling is required to enable Batlogg's claim 16. The only reason we can find for affirmatively slow cooling is to guarantee that the composition is composed of purely $A_1B_2Cu_3O_7$. However, Batlogg's claim 16 does not require it. Therefore, the lack of a teaching of "slow cooling" is not a persuasive reason for finding that Batlogg has failed to comply with the enablement requirement. Since Qadri has not shown that Batlogg's claim 16 lacks an enabling disclosure on these grounds, and since we are asked to review the Preliminary Motion only on these original grounds, we affirm the APJ's denial of that motion.

In their brief, Qadri (QB 66-74) presents additional grounds for finding a lack of enablement. They argue that Batlogg fails to provide an enabling disclosure due to deficiencies in Batlogg's specification that include disclosures of imprecise calcining, grinding and sintering steps; imprecise cooling and annealing parameters; and barium oxide starting material which is

impure and highly hygroscopic. Qadri (QB 69-70) also points out that Batlogg's application does not teach the importance of oxygen content or crystallographic structure for the composition (i.e., Ortho I) and therefore cannot guide one to select the proper manufacturing steps and parameters to achieve it. Qadri further argues (QB 70-72) that samples made in accordance with Batlogg's specification were nonhomogeneous and did not contain at least 90% of the ortho I material. Qadri also argues (QB 72-73) that similar enabling problems exist with respect to compositions other than those based on yttrium-barium-cuprate. Finally, according to Qadri, the APJ found that Batlogg enabled the essentially single phase composition described in Batlogg's Example 1 and Figure 4 but evidence adduced since then shows that the material of Example 1 and Figure 4 are different.

Batlogg (BaB 51-52) responds by arguing that neither slow cooling nor crystal structure are necessary to enable the Batlogg claim 16. Regarding the data, Batlogg (BaB 52-54) explains that the two samples came from the same batch but were sintered at different temperatures. Different samples notwithstanding, the results for the two samples are said to be nearly the same and to similarly exhibit transition temperatures above 90 degrees K. According to Batlogg they were indistinguishable and therefore for all intents and purposes there is no difference between Example 1 of Table 1 and Example 1 for Figures 2-4.

We have carefully reviewed Qadri's position and arguments but do not find that Qadri has made a persuasive case that Batlogg's disclosure could not enable one of skill in the art to make the composition set forth in their claim 16. A factor in our decision is that Qadri's arguments²⁵ are directed to whether Batlogg's specification would enable the count, not Batlogg's claim 16, which is the focus here. In re Van Geuns, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993).

We understand that the cooling step and other processing steps play a significant role in the content and placement of oxygen atoms within the orthorhombic structure. We also understand that the oxygen content and placement influences the transition temperature at which the material exhibits $R=0$, irrespective of whether the material exhibits this homogeneity or not. But, to comply with the enablement requirement, Batlogg need not have had a detailed understanding of Y-Ba-Cu-O chemistry. It is sufficient that they teach a method of making a composition that achieves the stated superconductive property. Qadri has the burden of showing that, given the information in Batlogg's specification, obtaining the claimed product would

²⁵ In fact Qadri goes even further. Qadri argues that Batlogg does not enable the count as they interpret it, which, as we have discussed, is too narrow a construction. This is especially the case with respect to their argument that samples made in accordance with Batlogg's specification were nonhomogeneous and did not contain at least 90% of the ortho I material.

require undue experimentation. "To be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation." Genentech v. Novo Nordisk, 108 F.3d 1361, 1365, 42 USPQ2d 1001, 1004 (Fed. Cir. 1997).

From our reading of the record, the manufacturing process is not especially complicated and appears to have become routine after many years of developing superconductive materials. Batlogg's specification (p. 8, lines 13-15) states that "[f]or many purposes, it is an advantage of the invention that fabrication of superconducting elements may utilize standard ceramic processing." (Beyers and Qadri applications place greater stress on the processing variables but, again, this is because of their intention to make a more homogeneous $A_1B_2Cu_3O_7$.) On the other hand, Batlogg's specification is not devoid of specifics (see pp. 8-9). The most crucial and difficult aspect of the process appears to rest on the selection of the right ingredients in the right proportions. This Batlogg appears to have done (p. 6).

With respect to Batlogg's disclosure of barium oxide instead of the better choice barium carbonate, this does not establish a lack of enablement for the claimed composition. Qadri has not shown that the claimed composition could not be made from barium oxide nor that selecting barium carbonate from the disclosed class

of "carbonates" (Batlogg specification, p. 8, line 17) amounts to anything other than routine skill.

Regarding Qadri's argument that compositions other than yttrium-barium-cuprate are not enabled, Qadri does not explain why their manufacture would require undue experimentation. Finally, regarding the data, we do not see, and Qadri has not explained, how a possible misdescription of data describing the resulting composition affects the ability of one skilled in the art to make the claimed composition.

We find therefore that Qadri has not met their burden of showing that one with skill in the art would not have been enabled to make the composition of claim 16. We have reviewed the additional grounds for reconsidering the APJ's decision of their Preliminary Motion for judgment and, for the foregoing reasons, Qadri has not sustained their burden and therefore we find no error in the APJ's denial.

We note that Batlogg has filed Motions to Suppress Evidence under 37 C.F.R. §§1.635 and 1.656(h) (paper no. 223 (1) and (2)) (BaM2; BaM3) against any testimony and exhibits Beyers or Qadri have put forward in support of their positions that Batlogg fails to satisfy enablement. We, as the Board, have considered all the evidence argued in the brief and still find that Qadri has not sustained their burden. Since we find Batlogg has satisfied the

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enablement requirement, Batlogg's motions to suppress are moot.

Whether Batlogg's Application Complies With The Best Mode Requirement of 35 U.S.C. § 112

A best mode issue with respect to Batlogg's application was raised by Qadri in a timely filed preliminary motion for judgment (Q6; paper no. 39). That motion was denied (paper no. 131). Qadri seeks review of the preliminary motion. - -

The grounds on which Qadri base their request for review were not raised in their preliminary motion but rather on new grounds in Qadri's belated motion QM4 (paper no. 241). Qadri (QB 88-92) argues that Batlogg's application does not set forth a best mode for carrying out their invention on two new grounds: a) Batlogg knew at the time they filed their application that barium carbonate was a better starting material than barium oxide for preparing the composition and yet did not disclose this and prepared all samples from barium carbonate, and b) although Batlogg's application states that 'carbonates' could be used (p. 8, line 17), does not suggest using barium carbonate. These are the only reasons we are given for reviewing the preliminary motion. Since neither of these grounds are mentioned in the preliminary motion, no reason has been given not to affirm the APJ's denial of the preliminary motion.

As to the belated motion, Batlogg has filed an opposition (paper no. 234) followed by Qadri's reply (paper no. 244). Batlogg (BaB 55) argues that Qadri's preliminary motion only raised a general best mode argument. The barium oxide/carbonate issue was not raised and it is now too late to raise it. Qadri (QRB 46-47) responds by saying that

The Party Qadri could not have known when the preliminary motions were filed that the Party Batlogg knew, as of their March 3, 1987, filing date to use barium carbonate. The Party Qadri could only learned that only by reviewing Dr. Cava's notebook (BX1, page 56). Not surprisingly, the Party Batlogg did not grant the Party Qadri access to that notebook before the Party Batlogg's testimony period for their case-in-chief.

We agree with Batlogg.

We have reviewed the record. Dr. Cava's notebook is discussed in Cava's declaration of August 27, 1991 (paragraphs 7-9). Counsel (McDonnell) for Qadri cross-examined Dr. Cava on September 24, 1991 on the contents of the notebook (see p. 271, BaR). The belated motion was filed on July 23, 1992, and after all the parties' briefs and reply briefs. "Pursuant to 37 CFR 1.655(b)(3), a party is not entitled to raise for consideration at final hearing a matter which could have been properly raised by motion unless the party shows good cause why the issue was not timely raised by motion," Grove v. Johnson, 22 USPQ2d 1044, 1046 (Bd. Pat. App. & Int. 1991). This motion is deemed untimely because the motion was filed after the reply brief was filed and

nearly 10 months after the close of the period for cross-examining Batlogg's witnesses. We can find no good reason why this was not filed earlier. Since Batlogg has not had the opportunity to fully respond to the issue, we do not treat the merits of Qadri's motion (QM4) under 37 C.F.R. §§ 1.635 and 1.633(a) (paper no. 241). The motion to consider the belated motion is denied and the motion for judgment is dismissed.

As a result of our decision of Qadri's \$635 motion, Batlogg's motion (BaM3) under 37 C.F.R. §§ 1.635 and 1.656(h) to suppress evidence by Qadri for improperly raising the issue of sufficiency of Batlogg's application under the best mode provision of 35 U.S.C. § 112 (paper no. 223(2)) is rendered moot.

We find that, under 35 USC 112, Qadri and Beyers have not sustained their burden to establish Batlogg's claim 16 is unpatentable.

Whether Beyers' Application Complies With 35 U.S.C. § 112

In view of our finding that Batlogg can support their date of constructive reduction to practice, Beyers cannot demonstrate prior conception and reduction to practice and therefore the issue Qadri raises (QI6) with respect to whether Beyers' application fails to comply with either the written description or enablement requirement is moot. However, for the sake of completeness, we review Qadri's position on these grounds.

At the outset we repeat what we have stated earlier: the question is not whether the count is patentable to any of the parties but whether the claims corresponding to the count are patentable to them. In re Van Geuns, 988 F.2d at 1184, 26 USPQ2d at 1059. Qadri's insistence (QB 75-76) that Beyers' application teach the specifics of the orthorhombic I structure is not relevant to the question of whether Beyers has complied with 35 U.S.C. § 112 since no such limitation is in any of Beyers' claims. Similarly, Qadri's criticism of Beyers' measurements assumes that the tests must determine the phases according to how Qadri has defined them.

This is also the problem with Qadri's (QB 79-83) argument with respect to other processing steps in Beyers' application, including a) heating time and temperature as they affect homogeneity; b) the omission of additional heating and grinding steps to yield a single phase composition; c) few details on preparing a rigid body; d) imprecise cooling/annealing step; and e) no disclosure of cool down factors, especially with respect to resulting grain size. In each instance, Qadri is requiring enablement of a product with a minimal amount of impurity, something the claims do not require.

Qadri (QB 78) also argues that Beyers' application fails to enable the invention because it misdescribes the calcining step. According to Qadri (QB 79), for example, "[o]nly about one half of

the disclosed preferred temperature range is recognized by the art as useful for calcining in the production [sic] a single phase compound." Beyers teaches a preferable range of 900-1000 degrees C. (Beyers' application, p. 2, lines 17-18). Qadri (QB 78) argues that only 900-950 degrees C is an acceptable range. The difference is 50 degrees at the high end but, even if Qadri is correct, this does not demonstrate the necessity for undue experimentation in selecting those temperatures that produce the claimed composition. That the range is only 100 degrees and Beyers' temperatures covers half of it suggests otherwise. Qadri has not shown that the Beyers' specification would entail undue experimentation in making the claimed composition and therefore Qadri has not sustained their burden of establishing unpatentability of Beyers' claims on these grounds.

OTHER MOTIONS TO EXCLUDE OR SUPPRESS EVIDENCE

Motion BeM1

Beyers move (paper no. 220(1)) under 37 C.F.R. §§ 1.635 and 1.656(h) to suppress evidence by Qadri - Exhibits Q-1 through Q-64 and Q-66 through Q-113. Beyers argue that these exhibits are incompetent, never offered into evidence, and most importantly are offered during cross-examination for the sole purpose of testing the adequacy of Beyers patent application:

The party Beyers hereby objects to all such testimony, to all such exhibits, to all such samples and to all work

performed on such samples, on the ground that it is all prohibited by 37 CFR 1.655(b). (See also Qadri p. 708). None of this testimony, nor any of the exhibits, in any way deals with a matter brought up by a preliminary motion under 37 CFR 1.633 or 1.634. It should all be suppressed.

Qadri filed an opposition (paper no. 239), with a letter (paper no. 231) correcting an error in the opposition. Beyers did not file a reply.

Beyers motion against Qadri to suppress evidence urges that Qadri exhibits Q-1 through Q-64 and Q-66 through Q-113 have not been offered into evidence and should therefore be suppressed. The motion is dismissed because we have not had need to refer to these exhibits in reaching our decision. Under other circumstances, the motion would have been denied to the extent that it is based on the contention that the exhibits have not been offered into evidence. The failure to state on the record that the exhibit is "offered into evidence" is not considered to be so defective as to warrant the exhibit's exclusion from consideration, where the exhibit was marked for identification and testimony was taken with respect thereto. Clevenger v. Martin, 1 USPQ2d 1793, 1799 (Bd. Pat. App. & Int. 1986).

Motion BeM2

Beyers (paper no. 220(2)) also moves under 37 C.F.R. §§ 1.635 and 1.656(h) to suppress evidence by Batlogg - Exhibits BX-1 through BX-18 on various grounds including hearsay, no

foundation, incompetent or irrelevant. Batlogg filed an opposition (paper no. 224). Beyers did not file a reply. The motion against Batlogg urges, inter alia, that Batlogg's Exhibits BX-1 through BX-18 "have not been offered into evidence" and should therefore be suppressed. The motion is dismissed because we have not had need to refer to these exhibits in reaching our decision. Under other circumstances, the motion would have been denied to the extent that it is based on the contention that Exhibits BX-1 through BX-18 have not been offered into evidence.

Batlogg Exhibits BX-1 through BX-18 were attached to Batlogg's declaration testimony and were filed with the declaration testimony. Batlogg points out in his opposition to the motion that rule § 1.672(b), which relates to affidavit or declaration testimony, states that a party shall not be entitled to rely on a document referred to in the affidavit unless a copy of the document is filed with the affidavit. Batlogg urges that he has complied with the requirements of 37 C.F.R. § 1.672(b). We agree with Batlogg that exhibits which are referred to in the declaration testimony and are duly filed with the declaration testimony have been offered into evidence according to the rules, and we will not suppress such documents on the ground that they have not been offered into evidence.

Beyers also urges that Batlogg Exhibits BX-1, BX-3, BX-4, BX-5, BX-9, BX-10, BX-14 and BX-15 are incompetent because they had

portions missing from them. The motion would have been denied to the extent that it urges that the Batlogg exhibits should be suppressed because portions of the exhibits were redacted. As pointed out by Batlogg in his opposition, Batlogg "relied only on those portions of notebooks and records of experiments that were deemed relevant to this interference." We will not suppress documents merely because portions are redacted, provided that the opposing parties are free to inspect the unredacted originals. No useful purpose is seen in the inclusion in the record of irrelevant material and of notebook pages that are not relied on. Batlogg points out in his opposition that the opposing parties were free to inspect the unredacted originals, that the party Qadri requested such access and was given access, and that the party Qadri never alleged that relevant material was edited out of Batlogg's exhibits.

Beyers requests that BX-12 be suppressed because it is objected to as hearsay. Batlogg exhibit BX-12 is a "Nova" TV show tape recording which contains recollections of some of the Beyers inventors and the Batlogg inventors. Beyers urges that most of the show consists of the host speaking and queries: "How can a videotape be cross-examined?" The motion would have been denied as to BX-12. Clearly, the Batlogg inventors testified in this proceeding, were made available for cross-examination, and could have been cross-examined as to any statements made on the "Nova"

TV show. Prior statements by a witness are not hearsay if the declarant testifies at the trial or hearing and is subject to cross-examination concerning the statement, and the statement is "(B) consistent with the declarant's testimony and is offered to rebut an express or implied charge against the declarant of recent fabrication or improper influence or motive." Rule 801(d)(1)(B), Federal Rules of Evidence.

Beyers states in his motion that BX-16 and BX-17 are objected to as totally irrelevant because they deal with materials which are different from those of the present invention. The motion would have been denied as to BX-16 and BX-17. As noted by Batlogg in his opposition, the exhibits are relevant to the meaning of the phrase "allowed to cool to room temperature." The meaning of the phrase is important with regard to the sufficiency under 35 U.S.C. § 112 of the Batlogg application.

Beyers requests that Batlogg exhibit BX-11 be suppressed because it "has no foundation laid for it." Batlogg argues in opposition that BX-11 is a published article that was introduced at the party Beyers' request. Beyers also objects to BX-13 on the ground that "no foundation has been laid for it." Batlogg exhibit BX-13 includes a letter from Walsh, counsel for Beyers, to McDonnell, with a copy to counsel for counsel for Batlogg, and an X-ray pattern. Beyers finally objects to BX-18, an article from the New York Times, as being hearsay, irrelevant and non-

probative. Under other circumstances, the motion would have been denied on these grounds with respect to these exhibits because they would bear on, for example, the issue of sufficiency under 35 U.S.C. § 112 of Batlogg's claimed composition.

Motion QM1

Qadri (paper no. 217(1)) moves under 37 C.F.R. § 1.656(h) "to exclude from evidence the following exhibits which have been offered into evidence by the Party Beyers et al: Exhibit Be 34, Exhibit Be 35, and Exhibit Be 36. These exhibits were submitted by Beyers during Qadri's rebuttal for the purpose of impeaching Qadri witness Lloyd. In her declaration (QR 647-8), Lloyd stated that based on her "experience, a standard single step calcination procedure as described in the IBM application . . . does not produce phase orthorhombic, superconducting $\text{Ba}_2\text{YCu}_3\text{O}_7$." To contradict Lloyd's opinion, Beyers (QR 870-1) submitted publications (Exhibits Be 34-36). Qadri objected to their introduction during the rebuttal testimony period and hereby moves under 37 C.F.R. §1.656(h) on the grounds that Beyers' exhibits were not identified and not used to impeach Lloyd; Qadri indicates that no question was asked of Lloyd as to whether the exhibits contradicted her opinion. Beyers filed an opposition (paper no. 228) and Qadri filed a Reply (paper no. 242). We note that Beyers mentions these exhibits in their reply brief (BeRB

57). However, since we have not relied on these exhibits or that portion of Beyers' reply brief, in reaching our decision, this motion is dismissed.

Motion QM2

Qadri (paper no. 217(2)) moves under 37 C.F.R. § 1.656(h) "to exclude from evidence all testimony by Dr. Stuart S. P. Parkin and Robert B. Beyers relating to magnetization tests of sample 4 and sample 5, and testimony based on these tests, which has been offered into evidence by the Party Beyers et al." Samples 4 and 5 are two in a series of samples of 1-2-3 superconductor material that Beyers prepared in accordance with Batlogg's specification but under various cooling conditions (BeR 467-9). Based on Parkin's Declaration (BeR 506), for example, Beyers concludes that % superconductivity cannot be determined from x-ray diffraction data. Beyers relies on diamagnetic shielding susceptibility and electrical resistivity data instead. Qadri seeks to obtain the underlying data substantiating these conclusions which they say they have not received.

Beyers filed an opposition (paper no. 228) stating that Qadri has been given all the diamagnetic shielding susceptibility information they need to calculate the % superconductivity of the samples.

Qadri filed a reply (paper no. 242). In their reply, Qadri states that this information is insufficient because Beyers

witness Parkin has stated (BeR 533-49) on cross-examination that the purity of the samples also depends on the samples' homogeneity - which was tested by field cooled and zero-field cooled magnetization tests (BeR 533-7). The latter data, Qadri argues, is necessary for a complete cross-examination of Parkin's expert testimony.

The issue of whether % superconductivity of a sample can be determined by x-ray diffraction appears to have been an important issue to the parties. Qadri states (QB 11-12):

Party Beyers relies, in its case-in-chief and on rebuttal, on DC magnetization tests to show phase purity; Party Batlogg and Party Qadri do not.

The AC magnetic susceptibility test does not provide a quantitative indication of the amount of superconducting phase. BAR 560, lines 20-23

See also Beyers brief (BeB 25-26):

Experimental proof of the need for slow cooling is given by the testimony of Dr. Stuart Parkin (Beyers p. 503-516). Dr. Parkin performed dc magnetic shielding measurements on samples to measure their superconducting phase purity. He examined five samples, all prepared essentially the same, except for the differences in cooling time. His experimental results are shown in Table I of Beyers p. 506.... The first three samples were prepared according to the Batlogg patent application instructions. They did not meet the count. . . . The last two samples, which were cooled slowly by deliberately and affirmatively controlling the cooling rate of the oven according to the Beyers teachings, did meet the count.

See also Batlogg's brief (BaB 45):

Dr. Parkin's diamagnetic shielding measurements are inherently incapable of determining whether at least 90% of any 1-2-3 sample has orthorhombic crystal structure.

Although we dismiss the motion because our decision does not depend on discrepancies in results obtained from different tests for evaluating purity, we see no good reason why Beyers should withhold data critical to the issue of whether a party had conceived or actually reduced to practice a composition consisting of Ortho I structure. Had we had the need to address that issue to determine priority, we would have granted Qadri's motion.

Motion QM3

Qadri (paper no. 217(3)) moves under 37 C.F.R. § 1.656(h) "to exclude from evidence Exhibit BX13, which has been offered into evidence by the Party Batlogg et al." This exhibit, which is in Batlogg's record (Batlogg Exhibit BX13), includes a letter dated August 9, 1991, from Beyers to Qadri (and sent to Batlogg). It states that Beyers:

have no x-ray measurements made on the materials listed in the middle of page 4 of the application. We did find an x-ray analysis for a sample of $Y_1Ba_2CuO_y$. The analysis was performed on March 10, 1987 and a copy is enclosed.

The March 10 x-ray diagram is enclosed but Qadri objects to it because, among other reasons, it has never been authenticated (i.e., "no foundation has been laid for it"), and there is no record of the sample from which the x-ray was taken. Beyers (BaR 374) themselves objected to this exhibit (see motion to suppress evidence under 37 C.F.R. §§ 1.635 and 1.657(h); paper no. 220(2) - see motion (6) below). Batlogg filed an opposition (paper no.

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226) to this motion to which Qadri has filed a reply (paper no. 240). We note that Batlogg relies on Exhibit BX13 (BaB 45) to argue that Beyers had a date of conception and reduction to practice no earlier than March 10, 1987. This motion is therefore relevant to Beyers case for priority.

The motion is dismissed as moot as to BX-13 because we have not considered BX-13 in reaching our decision.

WHETHER QADRI ENGAGED IN INEQUITABLE CONDUCT

Batlogg has raised an issue (BaI3) and filed a Motion (BaM1) for Judgment against Qadri under § 1.633(a) (paper no. 195) on grounds that Qadri's claims that correspond to the count are not patentable to Qadri due to Qadri's inequitable conduct. Batlogg's motion and a supplement to the motion were filed (April 1 and 6, 1992, respectively) after the close of the testimony period (March 22, 1992; see paper no. 143) and Qadri filed an opposition (paper no. 202) to which Batlogg filed a reply (paper no. 212). The APJ (paper no. 214) had deferred decision on the motion to final hearing. We now deny this motion.

Batlogg argues that certain statements Qadri made in their Rule 131 affidavit and Preliminary Statement are false. The statements are to dates of conception and reduction to practice which are earlier than the dates Qadri now relies upon in their Brief.

With respect to the preliminary statement, the Board has held that statements in the Preliminary Statements are not regarded as effective admissions except for the setting of limiting dates.

"'[t]he Preliminary Statement, through [sic] verified and somewhat in the nature of a pleading, is not regarded as evidence but as merely setting dates earlier than which evidence is not effective time-wise. Consequently the particular statements in the Preliminary Statement are not regarded as effective admissions except for the setting of limiting dates.'"

Gruber v. Via, 221 USPQ 276, 279 (Bd. Pat. Int. 1982).

Qadri would not have been permitted to stipulate dates earlier than set forth in the Preliminary Statement. The dates merely mark an outside limitation. They are not to be viewed as a concrete admission which a party may not later disavow. We agree with Qadri (Opposition, paper no. 202, p. 15) that, since 37 C.F.R. § 1.629(e) states that a "preliminary statement shall not be used as evidence on behalf of the party filing the statement," it would be contradictory to use it here to determine inequitable conduct.

Regarding the 131 affidavit, the dispute is whether it was proper for Qadri to make statements therein identifying "before March 5, 1987" as the date they produced a composition later confirmed to be a single phase, orthorhombic 1-2-3 superconducting material. Qadri (opposition, paper no. 202, pp. 8-14) acknowledges and explains inconsistencies with respect to what occurred on that date but maintains the importance of that date in

leading to the subject matter of the count. Batlogg disagrees (reply, paper no. 212, p. 3) that any such material was formed on the date. The dispute is a matter of how the parties view the information Qadri had in their possession on March 5. We agree that Qadri has taken a very liberal view of that knowledge and in fact we determined that Qadri was actually entitled to a much later date of conception. However, given Qadri's rationale for selecting those activities occurring prior to March 5, 1987, and that a principal argument Qadri is making is that their invention was an inevitable consequence of those activities, we are not convinced that Qadri presented the earlier dates based on such flimsy and unsupportable evidence that bad faith intent amounting to inequitable conduct was involved. Moreover, we do not find that Qadri's stipulation of the earlier date has had a material impact on the interference proceedings. "Inequitable conduct requires proof by clear and convincing evidence of a threshold degree of materiality of the nondisclosed or false information." Atlas Powder Company v. E.I. Du Pont De Nemours & Company, 750 F.2d 1569, 1577-78, 224 USPQ 409, 414-415 (Fed. Cir. 1984). For the foregoing reasons, we deny the motion.

WHETHER QADRI VIOLATED § 1.615

Beyers filed a motion (Bem3; paper no. 245) for judgment under 37 C.F.R. § 1.635 for judgment against Qadri under 37 C.F.R.

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§ 1.616 for violation of 37 C.F.R. § 1.615. The motion is directed at Qadri's continuation application Serial No. 07/587,466²⁶ and Qadri's parent application Serial No. 07/292,067, the latter is a divisional of Serial No. 07/158,483 involved in the interference. According to Beyers, both applications were prosecuted without consent from the APJ and therefore Qadri should disclaim the patent or judgment should be entered against Qadri in the present interference under 37 C.F.R. § 1.616. Qadri has filed an opposition (paper no. 246) and Beyers has filed a reply (paper no. 247) and attached to it a declaration from Beyers' counsel (paper no. 248).

In their opposition, Qadri directs attention to their Preliminary Motions of March 14, 1989 (paper no. 39, p. 15) wherein they state that they elected to prosecute the process claims restricted out of the Serial No. 158,483 application. Therefore, according to Qadri, all parties and the APJ were aware of Qadri's decision to prosecute the process claims. However, argues Beyers, the record does not show that the APJ consented to Qadri's decision.

"The party Beyers does not wish to engage in an argument as to whether or not the Examiner-in-Chief in fact gave his consent to the prosecution of the Qadri divisional application. The record does not show that he did, but fortunately, the Examiner-in-Chief at the time of the filing of the divisional application on December 30, 1988, is still the Examiner-in-Chief in the present interference, and he knows what he did. If he did give his consent, he can simply

²⁶ Now U.S. Patent 5,106,829, issued April 21, 1992.

deny the present motion. If he did not give his consent, it is respectfully requested that the present motion be granted."

We have carefully considered the parties' positions. We dismiss the motion for the following reasons.

We agree with Qadri that their statement in their Preliminary Motions of March 14, 1989 (paper no. 39, p. 15) put Beyers and the APJ on notice that a divisional application directed to the restricted out method claims would be further prosecuted. Although the APJ did not consent in writing to the subsequent prosecution of the method claims, we do not see that this was necessary. As is stated in the MPEP (2315.01):

Where an application involved in an interference includes, in addition to the subject matter of the interference, a separate and divisible invention, prosecution of the second invention may be had during the pendency of the interference by filing a divisional application for the second invention

The only constraint is that, if the claims in the divisional application are broader than the subject matter claimed in the interfering application, a patent to the divisible claims may not issue. MPEP § 2315.01. Beyers has not shown this to be the case. For this reason, Qadri is not in violation of § 1.615.

Furthermore, Beyers is asking for relief that we cannot grant. We have no authority to request Qadri to disclaim subject matter of Qadri's noninvolved patent. Our jurisdiction is limited to those patents which are in interference and to claims which correspond to the count. We do not have that situation here and

there is nothing on the record to show that Beyers moved under § 1.633(e) to declare an additional interference between Qadri's divisional application and Beyers application in interference²⁷. There being no issue of interfering subject matter, we cannot render a judgment with respect to Qadri's patent. We therefore dismiss this motion.

Summary

With respect to the motions, we hold the following:

QM1 Dismissed
QM2 Dismissed
QM3 Dismissed
QM4 Dismissed
BeM1 Dismissed
BeM2 Dismissed
BeM3 Dismissed
BaM1 Denied
BaM2 Moot
BaM3 Moot
BaM3 Moot

JUDGMENT

For the foregoing reasons:

Judgment as to the subject matter of the sole count in issue is hereby awarded to Batlogg et al., the senior party.

²⁷ We also point out that, given Qadri's notice that they would file a divisional application, if Beyers had a concern about the potential of starting another interference, as they said they had (paper no. 245, p. 3), it was incumbent on Beyers to take steps to file a motion requesting the declaration of an additional interference under § 1.633(e). Since no such steps were taken, this failure to act may raise an issue of estoppel.

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Syed B. Qadri, Louis E. Toth, Michael S. Osofsky, Steven H. Lawrence, Donald U. Gubser and Stuart A. Wolf, the junior party, are not entitled to a patent containing claims 24 and 25 of their application corresponding to Count 1.

Robert B. Beyers, Edward M. Engler, Paul M. Grant, Grace S. Lim, and Stuart S.P. Parkin, the junior party, are not entitled to a patent containing claims 1-10 of their application corresponding to Count 1.

Bertram J. Batlogg, Robert J. Cava and Robert B. Van Dover, the senior party, are entitled to a patent containing claim 16 of their application corresponding to Count 1. Claims 1-15 have been found to be unpatentable. Batlogg, Cava and Van Dover are not entitled to a patent containing claims 1-15 corresponding to the count.

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Marc L. Caroff
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Administrative Patent Judge)

Mary P. Downey
MARY P. DOWNEY)
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