

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

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(2) is not binding precedent of the Board.

Paper No. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRIAN D. HUNT

Appeal No. 94-0105
Application 07/854,124¹

ON BRIEF

Before KIMLIN, GARRIS, and PAK, Administrative Patent Judges.
GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

¹ Application for patent filed March 19, 1992.

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This decision on appeal involves claims 1 through 9, which are all the claims remaining in the application.

The subject matter on appeal relates to a process for making a high temperature superconductor (HTSC) Josephson element from YBaCuO (also referred to in the art as "YBCO") materials. Claim 1 adequately illustrates the claimed subject matter for the purposes of this decision:

1. A method of producing a high temperature superconductor Josephson element comprising the steps of:

providing a substrate;

depositing a lower superconducting electrode film layer of YBaCuO on the substrate;

depositing a weak link barrier layer of a nonsuperconducting film of N-YBaCuO on the lower film layer, and

depositing an upper superconducting counter-electrode film layer of YBaCuO on the barrier layer.

The references relied upon by the examiner as evidence of obviousness are:

G. Koren et al. (Koren), "Highly Oriented as-Deposited Superconducting Laser Ablated Thin Films of $Y_1Ba_2Cu_3O_{7-x}$ on $SrTiO_3$, Zirconia, and Si Substrates," 53 Appl. Phys. Lett. No. 23, 2330-2332 (1988)

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C.T. Rogers et al. (Rogers), "Fabrication of Heteroepitaxial $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ - $\text{PrBa}_2\text{Cu}_3\text{O}_{7-x}$ - $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ Josephson Device Grown by Laser Deposition," 55 Appl. Phys. Lett., no. 15, 2031-2034 (1989)

J. Gao et al. (Gao), "Controlled Preparation of all High-T_c SNS-Type Edge Junctions and DC SQUIDS," 171 Physica C, 126-130 (1990)

The claims on appeal stand rejected under 35 U.S.C. § 103 as follows²:

Claims 1, 2, 4 and 5 are rejected over Gao;

Claims 3, 6 and 7 are rejected over the combined disclosures of Gao and Rogers;

Claims 8 and 9 are rejected over the combined disclosures of Gao, Rogers, and Koren.

Appellant has presented separate arguments for the patentability of claims 1, 3, 4, 6, 8 and 9. Brief, Paper No.

² This appeal reaches the Board pursuant: a Brief (Paper No. 12); an Examiner's Answer (Paper No. 13); an amendment (Paper No. 14) and Reply Brief (Paper No. 15); a Supplemental Answer (Paper No. 16); a remand by the Board (Paper No. 17); a "Revised Examiner's Answer" (Paper No. 18); a Reply Brief, incorporating the previous briefs by reference, and including an amended claim (Paper No. 19); a "Second Examiner's Answer," (amended claim denied entry: Paper No. 20); a Reply Brief (Paper No. 21); and a "Supplemental Examiner's Answer" (Paper No. 22). The rejections on appeal are set out in Paper No. 18 at pages 3 through 6.

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12, pages 5 and 12-16. However, because the examiner has not carried his burden of establishing a case of prima facie obviousness of the subject matter of independent claim 1, and the supplemental references do not cure the deficiencies of the primary reference, we cannot sustain any rejections of record.

We base our decision on the examiner's position regarding the rejection of claim 1 as expressed in his answers, Paper No. 18, and Paper No. 20, item 5 (pages 2 to 3); we need not discuss the other rejections before us on this appeal. Appellant's position vis-à-vis the rejection of claim 1 is set out fully in Paper No. 12, pages 12-14.

Opinion

As evidence of obviousness of the subject matter of claim 1, the examiner relies on Gao, which he characterizes as disclosing each step of the recited process but for the use of

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N-YBaCuO as the weak link barrier layer.³ To remedy this defect, the examiner argues:

However, Gao et al disclose (see page 127, col. 1, lines 1-4) that PBCO⁴ has similar lattice constants as YBCO (Note: Both PBCO and N-YBCO have a perovskite crystal structure).

Furthermore, both Y and Pr are rare earth elements. Therefore, the normal conduction PBCO of Gao et al is similar to the claimed N-YBCO not only in lattice constants but also in chemical and electrical properties (i.e. both are non-superconducting or normal conducting).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the PBCO by N-YBCO as a weak line [sic: link] barrier layer in Gao et al's SNS⁵ edge Josephson junction *because the substitution of art recognized equivalents would lead to the expected success.*

Revised Examiner's Answer, Paper No. 18, at pages 3 to 4
(underscored emphasis original, italicized emphasis added).

³ Appellant appears to agree with this characterization, with the further objection that Gao does not disclose the deposition of the upper superconducting YBaCuO layer on a N-YBaCuO barrier layer. Brief, Paper No. 12 at page 9.

⁴ "PBCO" stands for PrBaCuO, wherein Pr, praseodymium, has been substituted for Y, yttrium.

⁵ SNS is an acronym for "superconducting-normal metal-superconducting" sandwich structures, which are one form of Josephson junction. Specification at page 2, lines 17-22.

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Appellant traverses this rejection on several grounds, Paper No. 12 at pages 12 through 14, urging, inter alia, that there is no motivation in Gao to substitute N-YBCO for PBCO; and that the prior art did not regard PBCO and N-YBCO as equivalents.

To establish a prima facie case of obviousness, the examiner must demonstrate that one of ordinary skill in the art would have found both a suggestion to perform the here claimed method, and a reasonable expectation of successfully doing so, in the prior art. In re Vaeck, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). Moreover, the examiner bears the initial burden of supplying the factual basis for his position. In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968). Although the examiner may take official notice of technical facts outside of the record to fill the gaps that might exist in the evidentiary showing to satisfy his burden, such asserted technical facts must be "capable of such instant and unquestionable demonstration as to defy dispute."

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In re Ahlert, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA
1970). However,

[a]ssertions of technical facts in areas of esoteric technology must always be supported by citation to some reference work recognized as standard in the pertinent art and the appellant given, in the Patent Office, the opportunity to challenge the correctness of the assertion . . . [a]llegations concerning 'knowledge' of the prior art, which might be peculiar to a particular art, should also be supported and the appellant similarly given the opportunity to make a challenge.

Ahlert, 424 F.2d at 1091, 165 USPQ at 420-1.

Appellant contends, and the examiner does not dispute, that no reference relied on in the rejections on appeal discloses N!YBCO, let alone its use as a weak link barrier layer in a

Josephson junction. The examiner's "official notice," although not denominated as such, is improper because it concerns facts in an esoteric technology, and because it concerns knowledge peculiar to that technology. Furthermore, the alleged equivalence of N-YBCO and PBCO has been challenged by appellant. Paper No. 12, paragraph bridging pages 13 and 14. In particular, appellant urges that PBCO was recognized

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as a nonsuperconductor, whereas YBCO was recognized as a "chameleon," which could change back and forth between superconducting and nonsuperconducting states. Paper No. 12, page 14, lines 2-7. The examiner has failed to come forward with evidence from the scientific and technical literature in support of his position that PBCO and N-YBCO were recognized as equivalents in the art: his position is merely speculation as to what the art might have recognized. The examiner's argument in Paper No. 20, item 5, pages 2 to 3, that superconductor YBCO was known at the time of appellant's invention to differ from N-YBCO "only in oxygen content" is similarly without support on the present record. Indeed, our review of the application file reveals only cautious speculation

as to the composition and structure of N-YBCO in appellant's specification (page 9, line 16 through page 10, line 7). We observe further that Agostinelli, of record and discussed in more detail post, discloses at page 11,396, left column, a nonsuperconducting YBCO material that differs in oxygen

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content and crystal structure from the superconducting YBCO, in direct contradiction to the examiner's position.

Accordingly, we find that the rejections of record lack a factual basis for the legal conclusion that the substitution of N-YBCO for PBCO would have been obvious to one of ordinary skill in the art, based on the disclosure of Gao. Absent some motivation, there can be no expectation of successfully modifying a reference. We conclude the examiner has not established a prima facie case of obviousness, and we reverse the rejection of claims 1, 2, 4 and 5 over Gao.

Since the remaining references do not cure the deficiencies of Gao, we are constrained to reverse the remaining rejections of record.

REMAND

We remand this application to the examiner to specifically consider the patentability of the appealed claims over the following prior art:

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B.D. Hunt et al. (Hunt) "All high T_c edge-geometry weak links utilizing Y-Ba-Cu-O barrier layers," Appl. Phys. Lett., no. 8, 982-4 (Aug. 1991)⁶

J.A. Agostinelli et al. (Agostinelli) "Cubic phase in the Y-Ba-Cu-O system," 43 Phys. Rev. B, no. 13, 11,396-99 (May 1, 1991)⁷

Both references are available under 35 U.S.C. § 102(a). Hunt is, by virtue of the other authors, the work of "another" on the present record, and appears to anticipate claims 1 through 9. Agostinelli, which is of record (see form PTO-1449, filed Apr. 21, 1992 in Paper No. 3), discloses a cubic, nonsuperconducting phase of YBCO. Page 11,396, left column. Agostinelli further discloses Josephson type sandwich structures of orthorhombic (superconducting) and cubic (nonsuperconducting) YBCO.

Page 11,399, left column, last paragraph. At least independent claim 1 appears to be anticipated by Agostinelli. Rejections of certain dependent claims over various

⁶ Cited on form PTO-892, copy attached to this decision. Actual publication date: Aug. 14, 1991.

⁷ Actual publication date: May 13, 1991.

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combinations of references may also be appropriate. In view of the many unresolved issues in this application, and the likelihood that some issues may be resolved by declarations under 37 CFR §§ 1.131 or 1.132, we decline to exercise our authority under 37 CFR § 1.196(b) to set forth new grounds of rejection.

Finally, while appellant, in rebuttal, must offer probative evidence in support of his arguments, In re Pearson, 494 F.2d 1399, 181 USPQ 641, 646, even if submitted in a declaration, In re Grunwell, 609 F.2d 486, 491, 203 USPQ 1055, 1059 (CCPA 1979), citing In re Payne, 606 F.2d 303, 315, 203 USPQ 245, 246 (CCPA 1979) (mere argument in a declaration is insufficient as evidence), we emphasize that the examiner's patentability determination must take into account any argument or evidence of nonobviousness the appellant may proffer concerning the above discussed issues.

SUMMARY

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For the above stated reasons, we reverse the examiner's decision rejecting the appealed claims over Gao, alone and in combination with Rogers and Koren, and we remand this application to the examiner for a determination of the patentability over each of Hunt and Agostinelli, alone or in combination with other references as the examiner deems appropriate.

REVERSED AND REMANDED

	EDWARD C. KIMLIN)	
	Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
	BRADLEY R. GARRIS)	APPEALS
AND	Administrative Patent Judge)	INTERFERENCES
)	
)	
	CHUNG K. PAK)	
	Administrative Patent Judge)	

National Aeronautics &
Space Administration
NASA Resident Office

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4800 Oak Grove Drive
Pasadena, CA 91101