

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte JAMES M. SCHUCHARDT and DANIEL J. MARTIN

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Appeal No. 2000-0953  
Application No. 08/288,418

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ON BRIEF<sup>1</sup>

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Before McCANDLISH, Senior Administrative Patent Judge, COHEN and NASE, Administrative Patent Judges.

NASE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 to 20, which are all of the claims pending in this application.

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<sup>1</sup> On May 11, 2000, the appellants filed a request (Paper No. 20) to withdraw their previously filed request for an oral hearing. Such request has been granted.

We REVERSE.

BACKGROUND

The appellants' invention relates to superconducting ultrabroadband antennas and in particular, to a high-temperature superconductor, broadband self-limiting spiral antenna with a controllable signature (specification, p. 1). A copy of the claims under appeal is set forth in the appendix to the appellants' brief.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

|                     |           |          |
|---------------------|-----------|----------|
| Koepf<br>1992       | 5,105,200 | Apr. 14, |
| Osterwalder<br>1992 | 5,159,347 | Oct. 27, |

In addition, the examiner also relied upon the appellants' admission of prior art (specification, page 5, lines 2-5) relating to a cavity filled with radiation absorbing material (Admitted Prior Art).

Claims 19 and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Koepf.

Claims 1 to 18 stand rejected under 35 U.S.C. § 103 as being unpatentable over Koepf in view of Osterwalder and the Admitted Prior Art.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejections, we make reference to the answer (Paper No. 16, mailed July 27, 1998) for the examiner's complete reasoning in support of the rejections, and to the brief (Paper No. 15, filed November 4, 1997) for the appellants' arguments thereagainst.

#### OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art, and to the respective positions articulated by the appellants and the examiner. As a consequence of our review, we make the determinations which follow.

#### **The anticipation rejection**

We will not sustain the rejection of claims 19 and 20 under 35 U.S.C. § 102(b).

To support a rejection of a claim under 35 U.S.C. § 102(b), it must be shown that each element of the claim is found, either expressly described or under principles of inherency, in a single prior art reference. See Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 772, 218 USPQ 781, 789 (Fed. Cir. 1983), cert. denied, 465 U.S. 1026 (1984).

Claims 19 and 20 read as follows:

19. A method of varying the scattering signature of an antenna having at least one radiating element fabricated at least in part from high temperature superconducting material, comprising selectably varying the temperature of at least a portion of the radiating element of the antenna about the critical temperature of said superconducting material to selectably vary the resistance of said portion of said radiating element and hence the overall pattern of energy emanating from said antenna.

20. A method of varying the scattering signature of an antenna having at least one antenna radiating element fabricated at least in part from high temperature superconducting material, said antenna being mounted on a host platform, to enable said antenna to blend in with the material of the host platform, comprising selectably varying the temperature of at least a portion of the antenna radiating element about the critical temperature

of said superconducting material to cause said superconducting material to be superconducting when said host platform is substantially metallic and to be non-superconducting when said host platform is substantially nonmetallic.

Koepf's invention relates to antenna systems, particularly antenna systems adapted to operate in the microwave and micro-microwave regimes and more particularly to high-gain phased antenna arrays operating from above 20 to beyond 100 gigahertz. The antenna of Koepf includes a dielectric substrate, a planar layer of superconductive material on one surface of the dielectric substrate patterned in the form of at least one, and preferably a plurality of, microwave antenna elements, connected to an antenna input port through a microwave feed network, and a planar layer of superconductive material formed on the other surface of the dielectric substrate. Koepf provides (column 3, line 54, to column 4, line 15) that

Antenna systems of the invention can thus include an array of superconductive antenna elements interconnected by a superconductive microwave network, which may include delay line portions, provided with a plurality of superconductive switching means that can be operated to provide variable phasing and directivity. In addition, an antenna system of the invention may be provided with one

or more antenna elements and means to transition selected portions of the one or more antenna elements from the superconducting material state to the normal conducting material state to thereby change its effective dimensions as an antenna element and provide radiation of microwave energy under another set of conditions. Exercising such a transition from the superconducting material state to the normal conducting material state can be achieved by means of exceeding the critical temperature, the critical current, the critical magnetic field, or a critical photon flux of the material in the said portion of the antenna element.

Antenna apparatus of this invention includes means to reduce the temperature of the superconductive materials forming components on the dielectric substrate below the critical temperatures and provides an antenna system with one or more microwave antenna elements, and an interconnecting microwave network with one or more variable antenna element interconnecting means, all operating in superconductivity. Superconducting operating temperatures can be provided by a cryogenic container refrigerated by a closed cycle cryogenic refrigerator, a stored cryogen, or in space, a heat sink.

We agree with the appellants argument (brief, pp. 4-7) that claims 19 and 20 are not anticipated by Koepf.

In our view, the recitation in claim 19 of "**selectably varying** the temperature of at least a portion of the radiating element of the antenna **about the critical temperature** of said

superconducting material **to selectably vary the resistance** of said portion of said radiating element and hence the overall pattern of energy emanating from said antenna" (emphasis ours) is not met by Koepf. It is our opinion, that at best Koepf discloses an on-off type of antenna element. That is, an antenna element that is made from a material that is either cooled below the critical temperature of the superconducting material to make the material superconducting or is not cooled below the critical temperature of the superconducting material so that the material is not superconducting. Thus, Koepf's antenna element is not readable on the above-noted limitation of claim 19.

Likewise, it is our view that the recitation in claim 20 of "**selectably varying** the temperature of at least a portion of the antenna radiating element **about the critical temperature** of said superconducting material **to cause said superconducting material to be superconducting** when said host platform is substantially metallic **and to be non-**

**superconducting** when said host platform is substantially nonmetallic" (emphasis ours) is not met by Koepf.

For the reasons set forth above, the decision of the examiner to reject claims 19 and 20 under 35 U.S.C. § 102(b) is reversed.

#### **The obviousness rejection**

We will not sustain the rejection of claims 1 to 18 under 35 U.S.C. § 103.

The appellants argue (brief, pp. 8-11) that the applied prior art does not suggest the claimed subject matter. We agree.

Claims 1 to 18 under appeal require an antenna assembly having a substantially continuous bandwidth from the microwave region of the electromagnetic spectrum to the VHF region of the spectrum. However, this limitation is not suggested by the applied prior art. In that regard, the antenna assembly of Koepf does not disclose a substantially continuous bandwidth from the microwave region of the electromagnetic

spectrum to the VHF region of the spectrum. Likewise, Osterwalder and the Admitted Prior Art do not disclose an antenna assembly having a substantially continuous bandwidth from the microwave region of the electromagnetic spectrum to the VHF region of the spectrum. To supply this omission in the teachings of the applied prior art, the examiner made a determination (answer, p. 4) that it would have been obvious to modify Koepf to cover a wide range of frequencies. However, even if true, this change to Koepf would not lead an artisan to arrive at the claimed invention since it would not meet the above-noted limitation of claims 1 to 18.

Moreover, in our view, the only suggestion for modifying Koepf in the manner proposed by the examiner stems from hindsight knowledge derived from the appellants' own disclosure. The use of such hindsight knowledge to support an obviousness rejection under 35 U.S.C. § 103 is, of course, impermissible. See, for example, W. L. Gore and Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). It

follows that we cannot sustain the examiner's rejections of  
claims 1 to 18.

CONCLUSION

To summarize, the decision of the examiner to reject claims 19 and 20 under 35 U.S.C. § 102(b) is reversed and the decision of the examiner to reject claims 1 to 18 under 35 U.S.C. § 103 is reversed.

REVERSED

|                                    |   |                 |
|------------------------------------|---|-----------------|
| HARRISON E. McCANDLISH             | ) |                 |
| Senior Administrative Patent Judge | ) |                 |
| )                                  | ) |                 |
|                                    | ) |                 |
|                                    | ) |                 |
|                                    | ) | BOARD OF PATENT |
| IRWIN CHARLES COHEN                | ) | APPEALS         |
| Administrative Patent Judge        | ) | AND             |
|                                    | ) | INTERFERENCES   |
|                                    | ) |                 |
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| JEFFREY V. NASE                    | ) |                 |
| Administrative Patent Judge        | ) |                 |

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