

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

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(2) is not binding precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GEORGE R. DVORSKY
AND DAVID W. LOVE

Appeal No. 95-4871
Application 08/172,666¹

ON BRIEF

Before HAIRSTON, KRASS, and FLEMING, Administrative Patent
Judges.

¹ Application for patent filed December 23, 1993.
According to applicants, the application is a division of
Application 07/604,306, filed October 29, 1990.

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HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 8 through 14 and 23. In an Amendment After Final (paper number 6), claim 14 was canceled, and claims 24 and 25 were added to the application. In a subsequent Action (paper number 7), the examiner indicated that claims 24 and 25 were allowed. Accordingly, claims 8 through 13 and 23 remain before us on appeal.

The disclosed invention relates to a ceramic actuator/sensor material that is encapsulated in a non-conductive fiber composite material. The non-conductive fiber composite material has a coefficient of thermal expansion between the coefficient of thermal expansion of the ceramic material and the coefficient of thermal expansion of a graphite-epoxy laminate structure.

Claim 8 is illustrative of the claimed invention, and it reads as follows:

8. An actuator/sensor package highly suited for installation by embedding in a graphite-epoxy laminate structure, the actuator/sensor package being made by a process including the steps of:

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bonding wire leads to electrodes of a ceramic actuator/sensor; and

encapsulating the ceramic actuator/sensor in a non-conductive fiber composite material having a coefficient of thermal expansion (CTE) between the CTE of the ceramic material and the CTE of a selected graphite-epoxy laminate structure;

whereby the encapsulating material provides good mechanical coupling, reduces thermally induced stresses, electrically insulates the actuator sensor, and protects it from mechanical damage.

The references relied on by the examiner are:

Wingrove 1971	3,594,514	July 20,
Evans 1973	3,711,617	Jan. 16,
Whatmore et al. (Whatmore) 1989	4,876,776	Oct. 31,

Claims 8, 12, 13 and 23 stand rejected under 35 U.S.C. § 103 as being unpatentable over Whatmore in view of Wingrove.

Claims 8 through 11 and 23 stand rejected under 35 U.S.C. § 103 as being unpatentable over Evans in view of Wingrove.

Reference is made to the brief and the answer for the respective positions of the appellants and the examiner.

OPINION

We have carefully considered the entire record before us, and we will reverse the obviousness rejections.

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In Whatmore, a piezoelectric composite is fabricated from a plurality of piezoelectric ceramic rods 2 that are placed in openings in a non-conductive fiber composite material (i.e., KEVLAR) reinforcing structure 14 (Figure 3). Wingrove discloses (Figure 2) an implantable hearing aid that includes a piezoelectric ceramic 15 encapsulated within an epoxy coating 18, and a silicon rubber 19. Both references disclose the claimed ceramic material, but neither ceramic material is encapsulated in a non-conductive fiber composite material.

The examiner's rejection (Answer, pages 3 and 4) is as follows:

It would have been obvious to one of ordinary skill in the art to adhere a material such as KEVLAR, which use is shown by Whatmore, to the piezoelectric ceramic in the device of Wingrove, in place of the silicon material around his piezoelectric ceramic. KEVLAR is a very well known material which has characteristics of withstanding excessive force without braking [sic, breaking]. Thus, it extends the life spans [sic, span] of the devices it covers. Alternatively it would have been obvious to one of ordinary skill in the art to effect complete encapsulation of Whatmore's device, which encapsulation is shown by Wingrove, in order to provide for more protection of the piezoelectric ceramic within. Again in this instance, the life span of the device could be extended, resulting in cost savings due to longer life and to longer mean time between failures because of a reduction of structural deficiencies.

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Appellants argue (Brief, pages 4, 5, and 7) that the applied references are not concerned with encapsulation of a piezoelectric ceramic with a non-conductive fiber composite material, and are not concerned with the differences in thermal expansion between the ceramic and the encapsulant. We agree.

With respect to the use of Whatmore's KEVLAR in the implantable hearing aid in Wingrove, the human body may or may not accept the KEVLAR. Even if the body would accept KEVLAR, who would want a hearing aid that needs that kind of protection? With respect to complete encapsulation of the piezoelectric composite in Whatmore (Figure 3), the encapsulants taught by Wingrove are not the claimed encapsulant. The mere fact that the prior art may be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. See In re Fritch, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992). The obviousness rejection of claims 8, 12, 13 and 23 is reversed.

Evans was cited with Wingrove in the obviousness

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rejection of claims 8 through 11 and 23. Evans discloses (Figure 5) a piezoelectric ceramic 35 sandwiched between layers of epoxy impregnated fiberglass cloths 36 and 37 to form a transducer for a piano key. The epoxy impregnated fiberglass cloth layers 36 and 37 do not encapsulate the piezoelectric ceramic 35.

The examiner is of the opinion that it would have been obvious to one of ordinary skill in the art to adhere the encapsulant disclosed by Evans to the piezoelectric ceramic

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disclosed by Wingrove or, in the alternative, to effect complete encapsulation of Evans' device based upon the teachings of Wingrove.

Appellants repeat their argument that the applied references are not concerned with encapsulation of a piezoelectric ceramic with a non-conductive fiber composite material, and are not concerned with the differences in thermal expansion between the ceramic and the encapsulant (Brief, pages 6 and 7).

We are of the opinion that the examiner has failed again to demonstrate that the prior art suggested the desirability of either proposed modification. The need for Evans' epoxy impregnated fiberglass cloth in Wingrove's implantable hearing aid has not been established, and the examiner has not explained how a completely encapsulated transducer in Evans will function as a piano key. The obviousness rejection of claims 8 through 11 and 23 is reversed.

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DECISION

The decision of the examiner rejecting claims 8 through
13 and 23 under 35 U.S.C. § 103 is reversed.

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
ERROL A. KRASS)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
)	
)	
MICHAEL R. FLEMING)	
Administrative Patent Judge)	

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TRW INC.
Space & Electronics Patent Counsel
One Space Park E1/4021
Redondo Beach, CA 90278