

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte MORITO AKIYAMA, TADAHIKO WATANABE, and KAZUHIRO NONAKA

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Appeal No. 1998-0378  
Application No. 08/705,063

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HEARD: October 11, 2000

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Before THOMAS, KRASS, and GROSS, Administrative Patent Judges.  
GROSS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 8 through 14, which are all of the claims pending in this application.

Appellants' invention relates to a two-layer composite structure including a functional layer of a voltage generating material and a structural layer for detecting cracks in the structural layer. Claim 8 is illustrative of the claimed invention, and it reads as follows:

8. A two-layer structure comprising:

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a structural material;

a voltage generating material formed of a ferroelectric material, a pyroelectric material, or a piezoelectric material, which is bonded to said structural material and which generates a voltage in accordance with an impact force applied to said structural material; and

an electrode, connected to said structural material and said voltage generating material, which detects cracks in said structural material by detecting said voltage generated by said voltage generating material.

The prior art reference of record relied upon by the examiner in rejecting the appealed claims is:

Dufrane et al. (Dufrane)	4,255,974	Mar. 17,
1981		

Claims 8 through 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Dufrane.

Reference is made to the Examiner's Answer (Paper No. 20, mailed October 15, 1997) for the examiner's complete reasoning in support of the rejections, and to appellants' Brief (Paper No. 19, filed July 15, 1997) and Reply Brief (Paper No. 21, filed October 30, 1997) for appellants' arguments thereagainst.

OPINION

We have carefully considered the claims, the applied prior art reference, and the respective positions articulated

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by appellants and the examiner. As a consequence of our review, we will reverse the obviousness rejection of claims 8 through 14.

Claim 8 requires, in pertinent part, "a voltage generating material formed of a ferroelectric material, a pyroelectric material, or a piezoelectric material." The examiner (Answer, page 3) recognizes that Dufrane's conductive layer of metal, an alloy, or a metal compound is not ferroelectric, pyroelectric, or piezoelectric, as recited in claim 8, but asserts that Dufrane's material is a "well known functional equivalent" of the claimed materials. We disagree. The function of the claimed materials is to generate voltages. Dufrane's materials cannot generate voltages; they must be placed in an electrical circuit for a voltage to be present. Since Dufrane's materials cannot function as the claimed voltage generating materials, they cannot be functionally equivalent to the claimed ferroelectric, pyroelectric, or piezoelectric materials.

Claim 8 further recites that the voltage generating material is bonded to a structural material and generates a voltage according to an impact force applied to the structural

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material. Again the examiner recognizes that Dufrane is deficient in that Dufrane fails to teach "that a voltage is generated in accordance with an impact force such that a crack is detected by monitoring said voltage." The examiner nonetheless concludes (Answer, pages 3-4) that the skilled artisan would have found it obvious "to monitor a voltage of the conductive element instead of the resistance of the conductive element to detect cracks ... [because] both voltage and resistance monitoring are well known electrical measuring methods."

We agree that both voltage and resistance monitoring are known electrical measuring methods. However, merely that both were known does not render obvious the substitution of one for another. As pointed out by appellants (Brief, page 5), the examiner has failed to provide any motivation from the prior art for using a voltage generating layer rather than a resistance layer. Thus, the examiner has failed to establish a prima facie case of obviousness. Consequently, we cannot sustain the rejection of claim 8 nor its dependents, claims 9 through 14.

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CONCLUSION

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

REVERSED

JAMES D. THOMAS	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
	)	BOARD OF PATENT
ERROL A. KRASS	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
	)	
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	)	
ANITA PELLMAN GROSS	)	
Administrative Patent Judge	)	

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