

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 14

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte REZA ZOUGHI and PAUL S. NOWAK

Appeal No. 95-3140
Application No. 08/058,453¹

ON BRIEF

Before URYNOWICZ, MARTIN, and LEE, Administrative Patent Judges.

URYNOWICZ, Administrative Patent Judge.

DECISION ON APPEAL

This appeal is from the final rejection of claims 1 and 8.

The invention pertains to using microwave signals for analysis of concrete. Claim 1 is illustrative and reads as follows:

¹ Application for patent filed May 7, 1993.

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1. A method for analyzing concrete, comprising:

transmitting a first microwave signal having a first frequency that is directed to concrete being tested having unknown water and cement proportions;

receiving a reflected microwave signal resulting from at least portions of said transmitted microwave signal being reflected by the concrete;

providing a first value related to a reflection coefficient for a concrete sample having known water and cement proportions;

obtaining a second value related to a reflection coefficient based upon at least said reflected microwave signal from the concrete being tested;

determining a difference magnitude related to a difference between said first value and said second value;

having analysis information related to correlating said difference magnitude and one of a plurality of strength related values for the concrete being tested; and

determining a strength related value for the concrete being tested using said difference magnitude and said analysis information.

The reference relied upon by the examiner as evidence of obviousness is:

Rzepecka et al. (Rzepecka), "Monitoring of Concrete Curing Process by Microwave Terminal Measurements," IEEE Transactions on Industrial Electronics and Control Instrumentation, Vol. IECI-19, No. 4, pp. 120-125 (November 1972).

Appealed claims 1 and 8 stand rejected under 35 U.S.C. § 103 as being unpatentable over Rzepecka.

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The respective positions of the examiner and the appellants with regard to the propriety of these rejections are set forth in the final rejection of July 14, 1994 (Paper No. 6), the

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examiner's answer of January 23, 1995 (Paper No. 11), the appellant's brief filed December 15, 1994 (Paper No. 10) and the reply brief filed March 24, 1995 (Paper No. 12).

APPELLANTS' INVENTION

Appellants' invention is directed to a method for analyzing concrete in connection with determining concrete strength parameters. With respect to Fig. 1, a first microwave signal having a first frequency is transmitted from oscillator 24 toward the concrete to be analyzed. The concrete being tested has unknown water and cement proportions. A microwave receiving section 40 receives a reflected microwave signal resulting from at least portions of the transmitted microwave signal being reflected by the concrete. A first value related to a reflection coefficient for a concrete sample having known water and cement proportions is provide (page 13, lines 1-20). A second value related to a reflection coefficient that is based upon the reflected microwave signal from the concrete being tested is obtained (page 8, lines 6-17). A difference magnitude is determined that relates to a difference between the first value and the second value (Figs. 5 and 7; page 14, line 17 to

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page 17, line 3). Analysis information is provided that
correlates the

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difference magnitude to strength related values for the concrete being tested (page 14, line 17 to page 15, line 11, and page 16, lines 19-25). Lastly, a strength related value for the concrete being tested using the difference magnitude and the analysis information is determined (page 15, lines 4-18 and page 16, lines 19-25).

THE PRIOR ART

The Rzepecka reference discloses that microwaves can be used to test the strength of concrete having known factors or parameters, such as type of mixture and moisture content. According to the reference, the same parameters affect the strength of concrete and its dielectric constant or permittivity. These parameters include the water to cement ratio of the cement. In Fig. 2(b), Rzepecka illustrates apparatus for measuring the reflection coefficient of a concrete surface and the actual strength of a concrete sample during its curing process. That apparatus includes an oscillator corresponding to appellants' oscillator 24 (Fig. 1), a directional coupler for coupling to a concrete sample corresponding to appellants' directional

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coupler 36 (Fig. 1) and a detector corresponding to
appellants'
detector 52.

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THE REJECTION UNDER 35 U.S.C. § 103

The burden of establishing a basis for denying patentability to a claimed invention rests upon the U.S. Patent and Trademark Office. In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness and to provide a reason why one having ordinary skill in the art would have been led to modify the prior art reference to arrive at the claimed invention. The requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

Sole independent claim 1 requires that the concrete being tested have unknown water and cement proportions, that a difference magnitude related to a difference between (1) a first value related to a reflection coefficient for a concrete sample having known water and cement portions and (2) a second value related to a reflection coefficient based upon at least said reflected microwave signal from the concrete being tested

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be determined, and that a strength related value for the concrete

be determined using the difference magnitude. None of these limitations are to be found in Rzepecka and it has not been specifically shown that appellants are simply normalizing Rzepecka's data as apparently contended by the examiner.

Appellants' argument that the claims are directed to determining a concrete strength related parameter when the concrete being tested has unknown water and cement proportions whereas the teachings of the reference rely on knowing or having information concerning those proportions has not been addressed by the examiner. Even assuming that normalization of data would have been obvious in Rzepecka, the reference is not concerned with the testing of concrete having unknown water and cement proportions and the examiner has not provided a reason why one

of ordinary skill in the art would have been led to modify the reference to test such concrete in the manner claimed by appellants. The reference teaches away from the concept of testing concrete of unknown water to cement proportions by indicating that knowledge of all factors relating to the

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concrete, including water and concrete proportions, is
important to obtaining unambiguous test results.

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In view of the above discussion, the rejection of claim 1 and dependent claim 8 under 35 U.S.C. § 103 as being unpatentable over Rzepecka must be reversed.

REVERSED

STANLEY M. URYNOWICZ, Jr.)	
Administrative Patent Judge)	
)	
)	
)	
)	BOARD OF PATENT
JOHN C. MARTIN)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
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JAMESON LEE)	
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APJ URYNOWICZ

APJ MARTIN

APJ LEE

DECISION: REVERSED

Typed By: Jenine Gillis

DRAFT TYPED: 14 Sep 99

FINAL TYPED: