The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BERND MAYER

Appeal No. 1998-2151
Application No. 08/580,823

ON BRIEF

Before THOMAS, HAIRSTON, and JERRY SMITH, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 2 through 11.

The disclosed invention relates to a process for detecting small irregularities on a conducting surface, and to a process for high-resolution measurement of impedance and non-homogeneities in a surface.

Claims 9 and 11 are illustrative of the claimed invention and they are appended to this decision.

Claims 2 through 11 stand rejected under the first paragraph of 35 U.S.C. § 112 for lack of enablement. The examiner's rejection (Answer, pages 3 and 4) is as follows:

> There is one and only one approach to extracting the surface (three-dimensional) distribution of values as described in the specification: two (surface) integral equations are setup based on multimode readings of the cavity Q. Any measurements carried out are to be supported by the only disclosed approach.
>
> Appellant's arguments that any non-disclosed feature is conventional would imply that no specification is really needed. The examiner's position in this regard is that any claim has to be supported by the particular approach being disclosed in detail in the specification, especially when the inventor himself so states (page 3 in the specification).
>
> The entire purpose of the measurements is "solving the first system and the second system to find the surface resistance and the surface reactance distribution" (claim 11 step "c"). The only reading recited or described is that of the "unloaded quality factor Qo". Note that there are no details in the disclosure of how to "set up" the given equations. There are no details of how to read the tangential magnetic field (which is needed for the set up). There are no details of how to set up the second equation, which requires non-dissipative readings (note that Qo does not show up). There are no details of how to solve the particular types of equations described.

Reference is made to the briefs and the answers for the respective positions of the appellant and the examiner.

OPINION

The lack of enablement rejection is reversed as to claims 9 and 10, and is sustained as to claims 2 through 8 and 11.

As indicated supra, the examiner's reasoning for finding lack of enablement pertains to the more narrow claims 2 through 8 and 11, and not to the broad claims 9 and 10. The Court clearly stated in In re Doyle, 482 F.2d 1385, 1392, 179 USPQ 227, 232 (CCPA 1973), the burden shifts to appellant to prove enablement[1] only after the examiner has successfully mounted a challenge to the adequacy of the disclosure for the claimed invention. For this reason, the rejection of claims 9 and 10 is reversed because the examiner has not provided us with any reasoning for finding lack of enablement as to claims 9 and 10.

Turning to the rejection of claims 2 through 8 and 11, we are of the opinion that the examiner has mounted a successful

[1] Even if the burden had shifted to appellant, we find that pages 197 through 199 of Appendix D to the brief provide an adequate explanation of Q.

challenge to the adequacy of the disclosure for these claims. We agree with the examiner that in the disclosure “there are no details . . . how to ‘set up’ the given equations,” “[t]here are no details of how to read the tangential magnetic field (which is needed for the set up),” “[t]here are no details of how to set
up the second equation, which requires non-dissipative readings
. . . , ” and “[t]here are no details of how to solve the particular types of equations described.” While the evidence submitted by appellants in the appendices to the brief offers interesting background reading for the claimed invention, it does not adequately address the questions raised by the examiner concerning the lack of disclosure for the specifically claimed equations. Thus, the rejection of claims 2 through 8 and 11 is sustained because to the skilled artisan the scope of these narrow claims does not bear a reasonable correlation to the scope of enablement provided by the specification. Genentech, Inc. v. Novo Nordisk A/S, 108 F.3d 1361, 1365, 42 USPQ2d 1001, 1004 (Fed. Cir. 1997).

DECISION

The decision of the examiner rejecting claims 2 through 11 under the first paragraph of 35 U.S.C. § 112 is affirmed as to claims 2 through 8 and 11, and is reversed as to claims 9 and 10. Accordingly, the decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

JAMES D. THOMAS Administrative Patent Judge	)	
KENNETH W. HAIRSTON Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JERRY SMITH Administrative Patent Judge	)	

KWH:hh

BROWDY & NEIMARK
419 SEVENTH STREET, N.W.
WASHINGTON, D.C. 20004

APPENDIX

9. A process for detecting small irregularities on a conducting surface, comprising:

providing a first electrical cavity resonator having a first open end and at least one additional electrical cavity resonator having a second open end, the first open end and the second open end having different dimensions;

exciting the resonators in the microwave region;

moving the resonators over the surface;

finding integrated surface impedance measurements over the first open end and the second open end by variations in Q-factors of the resonators in moving over the surface;

Fourier-transforming the impedance measurements; and

determining locations of the small irregularities by correlating respective Fourier transforms;

whereby the locations are determined when the irregularities are smaller than any resonator open end.

11. A process for high-resolution measurement of impedance and non-homogeneities in a surface, comprising:

providing M cavity resonators each capable of N_m modes of vibration;

exciting the cavity resonators such that at least two different patterns of electromagnetic field, wherein at least one of different resonators or different modes, are provided by excited resonators;

each of the excited resonators period an mth of the M resonators and period excited in an nth mode, where $1 \le m \le M$ and $1 \le n_m \le N_m$;

moving the excited resonators over the surface such that an electromagnetic field of the excited resonators contact the surface;

for each of the excited resonators, measuring at each position $\vec{r}$ of the surface a respective modeled displacement factor $Q_{n_m}^{0}(\vec{r})$;

$$\sum_{l=m}^{M} N_m \quad \text{first integral} \qquad (8)$$

effing qv a first system of equations, the equations each period of the form

$$\left\{ \begin{array}{l} \\ \\ \\ \\ \beta^{do}(\omega_{n_m}, \vec{r}_1) \left| H_{n_m}^{L}(\vec{r}_1, \vec{r}) \right| s_{1,b} = \\ \\ \\ \\ E_m^{do}(\vec{r}) \end{array} \right.$$

$$\frac{\omega^{n_m} W^{n_m}}{Q_0^{n_m}(\vec{r})} - \int_{F^m_{Re}(\vec{r})} R^m_{Re}(\omega^{n_m}, \vec{r}\,') \, |H_t^{n_m}(\vec{r}\,', \vec{r})|^2 da' - P^{n_m}$$

wherein

$R_{Ob}(\omega^{n_m}, \vec{r})$ is a surface resistance distribution,

$F^m_{Ob}(\vec{r})$ is an area fraction of the surface exposed to the electromagnetic field where resonator m is at position $\vec{r}$;

$H_t^{n_m}(\vec{r}\,', \vec{r})$ is a tangential magnetic field,

ω^{n_m} is a resonance angular frequency,

W^{n_m} is the entire energy stored in an excited resonator m of the mode n_m of the resonator m at position $\vec{r}$,

$R^m_{Re}(\omega^{n_m}, \vec{r})$ is a resistance of a remaining resonator surface $F^m_{Re}(\vec{r})$ of resonator m at position $\vec{r}$, and

P^{n_m} is the other losses, not caused by the surface resistance, of the mode n_m of an excited resonator m at position $\vec{r}$ with resonance angular frequency ω^{n_m} as measured at each position $\vec{r}$;

(b) setting up a second system of $\sum_{m=1}^{M} N_m$ second integral equations, the equations each being of the form

$$\int_{F^m_{Ob}(\vec{r})} X_{Ob}(\omega^{n_m}, \vec{r}\,') \, |H_t^{n_m}(\vec{r}\,', \vec{r})|^2 da' =$$

$$\int_{V} X_{m}^{ke}(\omega_{n}, \vec{r}\,') \left| H_{n}^{f}(\vec{r}\,', \vec{r}) \right| dS' - E_{m}^{ke}(\vec{r}) = W_{n} - S(\omega_{n} - \omega_{n}^{0})$$

where

$X^{do}(\omega_{n}, \vec{r})$ is a surface resistance distribution,

ω_{n}^{0} is a resonance circuit frequency of mode m of resonator n with an ideally conducting periphery, and

$X_{m}^{ke}(\omega_{n}, \vec{r})$ is a resistance of a remaining resonator surface of resonator m at position $\vec{r}$;

(c) simultaneously solving the first system and the second system to find the surface resistance distribution and the surface reactance distribution,

wherein precision is enhanced such that microwave excitation permits millimeter range measurement of the non-homogeneities.