Paper No. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte XIAOSHU QIAN and YINONG DING

Appeal No. 2001-1312
Application No. 08/989,701

ON BRIEF

Before KRASS, RUGGIERO, and GROSS, Administrative Patent Judges.

RUGGIERO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal from the final rejection of claims 2-8, which are all of the claims pending in the present application. Claim 1 has been canceled. An amendment filed January 19, 2000 after final rejection was denied entry by the Examiner.

The claimed invention relates to a method for synthesizing music and speech sound signals using sinusoidal modeling. More particularly, a quadratic phase model approach is provided in which polynomial coefficients are determined by least-square

fitting the model using both frequency and phase measurements. According to Appellants (specification, page 4), the use of a quadratic phase model reduces the computation requirements of the conventionally used cubic phase interpolation algorithm.

Claim 2 is illustrative of the invention and reads as follows:

> 2. A method for synthesizing music and/or speech sound signals using sinusoidal modeling, comprising the steps of:
>
> measuring frequency and phase values at frame boundaries $t = t_i$ and $t = t_{i+1}$ $(O \leq i < N)$ for N data frames of interval length T of a sampled signal;
>
> modeling phase and frequency functions for the ith data frame using a quadratic phase model $\theta_i(\tau)=a_i+b_i\tau+c_i\tau^2$, $\omega_i(\tau)=b_i+2c_i\tau$, where $\tau = t - t_i$;
>
> determining polynomial coefficients a_i, b_i, c_i assuming unwrapped phase and frequency are continuous at frame boundaries, and determining unknowns by minimizing a square error function; and
>
> synthesizing said music and/or speech sound signals from said model and coefficients.

As the sole rejection by the Examiner before us, claims 2-8 stand finally rejected under 35 U.S.C. § 112, first paragraph, as being based on an inadequate disclosure.

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Briefs[1] and Answer for their respective details.

OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the Examiner, and the evidence and arguments relied upon by the Examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, Appellants' arguments set forth in the Briefs along with the Examiner's rationale in support of the rejection and arguments in rebuttal set forth in the Examiner's Answer.

It is our view, after consideration of the record before us, that Appellants' specification in this application describes the claimed invention in a manner which complies with the requirements of 35 U.S.C. § 112. Accordingly, we reverse.

As to the Examiner's assertion of lack of enablement of Appellants' disclosure, we note that, in order to comply with the enablement provision of 35 U.S.C. § 112, first paragraph, the

[1] The Appeal Brief was filed March 1, 2000 (Paper No. 21). In response to the Examiner's Answer dated October 18, 2000 (Paper No. 24), a Reply Brief was filed November 8, 2000 (Paper No. 25), which was acknowledged and entered by the Examiner as indicated in the communication dated November 30, 2000 (Paper No. 26).

disclosure must adequately describe the claimed invention so that the artisan could practice it without undue experimentation. In re Scarbrough, 500 F.2d 560, 566, 182 USPQ 298, 303 (CCPA 1974); In re Brandstadter, 484 F.2d 1395, 1404, 179 USPQ 286, 293 (CCPA 1973); and In re Gay, 309 F.2d 769, 774, 135 USPQ 311, 316 (CCPA 1962). If the Examiner has a reasonable basis for questioning the sufficiency of the disclosure, the burden shifts to Appellants to come forward with evidence to rebut this challenge. In re Doyle, 482 F.2d 1385, 1392, 179 USPQ 227, 232 (CCPA 1973), cert. denied, 416 U.S. 935 (1974); In re Brown, 477 F.2d 946, 950, 177 USPQ 691, 694 (CCPA 1973); and In re Ghiron, 442 F.2d 985, 992, 169 USPQ 723, 728 (CCPA 1971). However, the burden is initially upon the Examiner to establish a reasonable basis for questioning the adequacy of the disclosure. In re Strahilevitz, 668 F.2d 1229, 1232, 212 USPQ 561, 563 (CCPA 1982); In re Angstadt, 537 F.2d 498, 504, 190 USPQ 214, 219 (CCPA 1976); and In re Armbruster, 512 F.2d 676, 677, 185 USPQ 152, 153 (CCPA 1975).

The Examiner has questioned the sufficiency of Appellants' disclosure in describing the necessary structure " . . . for carrying out the detailed relationships necessary to carry out the invention, i.e., the synthesis of music and speech."

(Answer, page 3 which makes reference to page 2 of the final Office action mailed December 14, 1999, paper no. 17). The Examiner concludes (id.) that a skilled artisan " . . . would be forced through undue experimentation to arrive at the detailed relationships necessary to carry out the invention."

After careful review of the arguments of record, however, we are in agreement with Appellants' position as stated in the Briefs. As pointed out by Appellants (Brief, pages 5-7; Reply Brief, pages 1 and 2), the Examiner, aside from a general allegation of insufficiency, has never specifically indicated how Appellants' disclosure would not be enabling with regard to the particular method recited in the appealed claims. For example, the Examiner has never indicated what is deficient in Appellants' disclosure related to the claimed frequency and phase measurement steps as well as the development of a model for the frequency and phase functions. Our review of Appellants' specification, beginning at page 6, reveals a detailed description of the use of the claimed quadratic phase model for modeling phase and frequency, as well as a description of the claimed determination of polynomial coefficients and the use of squared error function to determine unknowns. Further, given the notoriety in the art

of synthesizing speech or music signals from a developed sinusoidal model, we fail to see how Appellants' disclosure would not be enabling, and the Examiner provides no basis for concluding otherwise.

In view of the above, we find that the Examiner has not established a reasonable basis for challenging the sufficiency of the instant disclosure. While some experimentation by artisans may be necessary in order to practice the invention, we find that such experimentation would not be undue. Accordingly, we will not sustain the rejection of claims 2-8 under the first paragraph of 35 U.S.C. § 112, and the Examiner's decision rejecting claims 2-8 is reversed.

REVERSED

ERROL A. KRASS Administrative Patent Judge	)	
JOSEPH F. RUGGIERO Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
ANITA PELLMAN GROSS Administrative Patent Judge	)	

JFR:hh

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