

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte ARUNA BAYYA  
and MARVIN VIS

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Appeal No. 1999-0437  
Application 08/627,249

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ON BRIEF

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

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-20, which constitute all the claims in the application.

The disclosed invention pertains to a method and apparatus for evaluating the quality of speech in a voice communication system.

Representative claim 1 is reproduced as follows:

1. An output-based objective method for evaluating the quality of speech in a voice communication system comprising:

providing a plurality of speech reference vectors, the speech reference vectors corresponding to a plurality of known clean speech samples obtained in a quiet environment;

receiving an unknown corrupted speech signal from an unavailable clean speech signal that is corrupted with distortions;

determining a plurality of distortions by comparing the unknown corrupted speech signal to at least one of the plurality of speech reference vectors; and

generating a score representing a subjective quality of the unknown corrupted speech signal based on the plurality of distortions.

The examiner relies on the following references:

Bahl et al. (Bahl)	4,718,094	Jan. 05, 1988
Picone et al. (Picone)	4,815,134	Mar. 21, 1989
Sakamoto et al. (Sakamoto)	5,404,422	Apr. 04, 1995
Hollier	5,621,854	Apr. 15, 1997

(filed Dec. 12, 1994)

Claims 1, 10 and 19 stand rejected under 35 U.S.C.

§ 102(e) as being anticipated by the disclosure of Hollier.

Claims 2-9, 11-18 and 20 stand rejected under 35 U.S.C. § 103.

As evidence of obviousness the examiner offers Hollier in view of Sakamoto with respect to claims 2-4, 11-13 and 20, Hollier

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in view of Bahl with respect to claims 5, 9, 14 and 18, and  
Hollier in view of Bahl and Picone with respect to claims 6-8  
and 15-17.

Rather than repeat the arguments of appellants or the  
examiner, we make reference to the briefs and the answer for  
the respective details thereof.

#### OPINION

We have carefully considered the subject matter on  
appeal, the rejections advanced by the examiner and the  
evidence of anticipation and obviousness relied upon by the  
examiner as support for the rejections. We have, likewise,  
reviewed and taken into consideration, in reaching our  
decision, the appellants' arguments set forth in the briefs  
along with the examiner's rationale in support of the  
rejections and arguments in rebuttal set forth in the  
examiner's answer.

It is our view, after consideration of the record  
before us, that the applied prior art does not support any of  
the rejections made by the examiner. Accordingly, we reverse.

We consider first the rejection of claims 1, 10 and 19  
under 35 U.S.C. § 102(e) as being anticipated by the

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disclosure of Hollier. These are the only independent claims on appeal before us. Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention as well as disclosing structure which is capable of performing the recited functional limitations. RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir.); cert. dismissed, 468 U.S. 1228 (1984); W.L. Gore and Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1554, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

With respect to each of these claims, the examiner has indicated how he reads the claimed invention on the disclosure of Hollier [Paper No. 13, pages 2-3, incorporated into the answer at page 4]. Appellants argue that the Hollier system does not use a plurality of distortions as claimed and is not based on an unknown corrupted speech signal as claimed [brief, pages 5-8]. The examiner responds that the error activity and error entropy determined by Hollier represent two measurements of distortion. The examiner also argues that Hollier discloses an output-based speech analyzing system in the

discussion of the prior art. Appellants respond that error activity and error entropy are two different statistical characteristics of a single distortion measure. Appellants also argue that the prior art systems disclosed by Hollier do not use a plurality of distortions as claimed.

We agree with appellants. Except for the background of the invention section of Hollier, Hollier is directed to a speech analysis system which uses the original speech input signal in the distortion analysis [note line 9 in Figure 2]. Thus, the error activity and error entropy measures of distortion in Hollier are applied to a speech signal using a known corrupted speech signal. Independent claims 1, 10 and 19 all recite that the evaluation is based on an unknown corrupted speech signal derived from an unavailable clean speech signal. The invention of Hollier is not related to such a speech analysis system.

The examiner attempts to avoid this problem by noting that Hollier recognized output-based systems in the discussion of the background of the invention. While this is true, Hollier's discussion of the background of the invention merely notes that it was known to apply a single conventional measure

of distortion to an output-based speech analysis system [column 1, line 60 to column 2, line 20]. Thus, the examiner has taken one feature from Hollier's background (the output-based system) and combined it with a feature from Hollier's input-based speech analysis system (the plural measures of distortion). Since the output-based system and the input-based system are not disclosed by Hollier to be simultaneously useable, there is no disclosure of combining the plurality of distortion measurements used in Hollier's input-based invention with the output-based system of the prior art. The examiner has, therefore, combined two unrelated features of the Hollier disclosure to arrive at the claimed invention.

Since Hollier does not disclose the combined features of an output-based speech analysis system and the use of a plurality of distortions in a single embodiment, the disclosure of Hollier does not fully meet the invention of claims 1, 10 and 19 as required under 35 U.S.C. § 102. Therefore, we do not sustain the examiner's rejection of claims 1, 10 and 19 as anticipated by Hollier.

We now consider the various rejections made by the examiner under 35 U.S.C. § 103. Appellants argue that these

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dependent claims are patentable based on their dependence from independent claims 1, 10 and 19. The examiner cites Sakamoto, Bahl and Picone only to meet features recited in these dependent claims. There is no attempt made by the examiner, however, to indicate that these additional references overcome the deficiency in Hollier discussed above. Therefore, the obviousness of the difference between independent claims 1, 10 and 19 and the teachings of Hollier has never been addressed by the examiner. Since this difference exists in the dependent claims as well as the independent claims discussed above, the examiner has failed to establish a prima facie case of the obviousness of dependent claims 2-9, 11-18 and 20. Accordingly, we do not sustain any of the examiner's rejections under 35 U.S.C. § 103.

In summary, we have not sustained any of the examiner's rejections of the claims on appeal. Therefore, the decision of the examiner rejecting claims 1-20 is reversed.

REVERSED

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KENNETH W. HAIRSTON	)	)
Administrative Patent Judge	)	
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	)	
	)	BOARD OF PATENT
ERROL A. KRASS	)	)
Administrative Patent Judge	)	APPEALS AND
	)	
	)	INTERFERENCES
	)	
JERRY SMITH	)	
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