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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KEITH I. MULFORD,
THOMAS J. McCLAUGHRY,
and GARY W. PERSINOTTI

Appeal No. 96-3366
Application 08/292,700[1]

ON BRIEF

Before URYNOWICZ, JERRY SMITH and BARRETT, Administrative Patent Judges.

URYNOWICZ, Administrative Patent Judge.

DECISION ON APPEAL

This appeal is from the final rejection of claims 1-8, all the claims pending in the application.

[1] Application for patent filed August 19, 1994. According to appellants, this application is a continuation-in-part of Application 08/016,445, filed February 11, 1993, now abandoned.

The invention pertains to a method and apparatus for a communications unit to alert a user when the unit is approaching the limits of a transmitting source's coverage area. Claim 1 is illustrative and reads as follows:

1. A method for a communication unit to alert a user, in such a manner so as not to degrade audio quality, when the communication unit is approaching limits of a transmitting source's coverage area, the method comprises the steps of:

a) monitoring, by the communication unit, error correction of received digital signals, wherein the received digital signals are transmitted by the transmitting source;

b) determining, by the communication unit, results of the error correction;

c) comparing, by the communication unit, the results of the error correction with a first predetermined threshold, wherein the first predetermined threshold is set within a range of optimal error correction rate to non-operable error correction rate; and

d) generating, by the communication unit, an indication that the results of the error correction exceeds the first predetermined threshold such that the user of the communication unit is alerted that the communication unit is approaching the limits of the transmitting source's coverage area, where the indication is a simulated analog RF channel noise signal.

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

Marui et al. (Marui)	4,996,715	Feb. 26, 1991

The appealed claims stand rejected under 35 U.S.C. § 103 as being unpatentable over Marui.

The respective positions of the examiner and the appellants with regard to the propriety of these rejections are set forth in the final rejection (Paper No. 5) and the examiner's answer (Paper No. 10) and the appellants' substitute brief (Paper No. 12).

Appellants' Invention

The error correcting capability of a digital communication system maintains audio quality (i.e., reduces noise) even at distances which would otherwise give an indication to a user of increasing distance from the transmitter. As such, breakdown of audio quality sufficient to indicate a fringe condition does not occur until the user is close to the out-of-range distance, at which point corrective actions may not be able to be taken without at least a temporary loss of communications.

Analog communication systems offer no such protection against noise in received signals. Because the amount of noise in a received message is directly proportional to the distance between the transmitter and receiver, the amount of background noise in received audio is used to judge the strength of the received signal, and consequently, where users are relative to the outer limits of a given transmitter's coverage area. Thus, users can take corrective action to stay within the coverage area.

The present invention provides for the indication of coverage area limits within digital communication systems. With respect to Figure 4, error correction information, preferably in the form of bit-error rates (BER)(402) and/or received signal strength information (RSSI)(403), is provided. A threshold comparison and range determination function (405) uses the BER and/or RSSI to determine the distance between the transmitter and the receiver. A simulated analog RF channel noise generator (407) generates noise proportional to the range indication, which noise is added (410) to recovered speech signals during silent or near-silent periods of speech, as determined by a speech analyzer (409).

An audible indication of coverage area limits allows a user to initiate corrective action, if necessary. This is distinct from prior art digital communication systems which, due to the reduction of recovered noise brought about by error correction techniques, do not allow a user to judge their proximity to coverage area limits through the recovered noise.

The Prior Art

In Figure 1, Marui illustrates apparatus for use in a cellular mobile telephone system comprising means for alarming (17, 18) at least a user operating the apparatus in response to a drop in signal strength of radio frequency signals received over an established communication channel (13, 11, 22, 23) when the apparatus approaches a boundary of service area in a cellular mobile telephone system. The signal strength is repetitively checked to determine if it has fallen below a first predetermined signal strength value. When the signal strength falls to or below a second predetermined signal strength value, the radio telephone apparatus causes a disconnection of the telephone link and returns the apparatus to a standby mode.

The Rejection under 35 U.S.C. §103

Appellants argue that Marui does not teach or suggest the use of an analog RF channel in a communication unit for generating an indication which is a controlled simulated analog RF channel noise signal. It is asserted that an indication which simulates a phenomenon known to occur at coverage area boundaries (i.e., recovered noise) is not obvious in view of Marui because the reference teaches

"various sounds selected so as to be distinguishable from known sounds."

Appellants urge that error detection/correction is not inherent or obvious to Marui because Marui deals with analog signals, which those of ordinary skill in the art would have recognized to be incompatible with error detection/correction.

In response to the prior argument, the examiner states that the claims of Marui are not limited to tones, simulated voice alarms and/or visual displays. Rather, they encompass visual indications and generic sounds (i.e., claim 2). The use of a simulated analog RF noise signal in Marui would have been obvious to one of ordinary skill in the art because one would want to design an indicator that would be distinctive from other cellular phones. Purportedly, this is an arbitrary design choice because one of ordinary skill could design an infinite plurality of sounds to indicate to a user the approach of a boundary.

With respect to appellants' latter argument, the examiner asserts the issue is whether Marui can be modified to the extent that the bit error rate measurement can be utilized as an indication of the approach of the fringe coverage limit for a cellular telephone apparatus. It is urged that the modification would have been obvious because to use bit error rates (BER) or signal quality to determine the limit of a transmitter's coverage is a complementary analysis to received signal strength. The examiner's rationale at page 4 of the answer is,

> In other words, <u>when signal strength is low, noise is going to obscure your signal thereby introducing errors</u>. So if one is monitoring signal strength to determine when

> one is reaching the fringe of a transmitter's coverage area, one would be similarly motivated to monitor error rates because an increase in the noise (indicating a corresponding decrease in signal strength) which bleeds through your signal indicates that your [sic] reaching said transmitter's limit.

After consideration of the positions and arguments presented by both the examiner and the appellants, we have concluded that the rejection should not be sustained.

The examiner's rejection of claims 1-8 involves an obviousness modification of the prior art to Marui. To sustain such a rejection, there must be some teaching or suggestion to make the alleged obvious modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). There is simply no teaching or suggestion in Marui to monitor error correction of received digital signals because Marui discloses an analog system, and in analog systems, bit error correction is not performed. It is only in digital systems that bit error correction is performed. Furthermore, as taught by appellants, an analog system provides a sufficient "warning" area prior to reaching an out-of-range location but a digital system does not. See appellants' Figure 3. Being directed to an analog system, Marui's device does not encounter this problem nor does the reference recognize this problem in digital systems.

Because Marui does not teach the above error correction, there is also no teaching or suggestion to generate a controlled simulated analog RF channel noise signal when the results of the error correction exceeds a first predetermined threshold.

Even assuming the examiner is correct that Marui can be modified to the extent that bit error

rate measurement can be utilized as an indication of the approach of the fringe coverage limit for a cellular telephone apparatus, this is insufficient to sustain the rejection of independent claims 1 and 5 because Marui has not been shown to teach or suggest the modification. In re Fritch, supra.

REVERSED

STANLEY M. URYNOWICZ, JR.	)	
Administrative Patent Judge	)	
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	)	APPEALS AND
JERRY SMITH	)	INTERFERENCES
Administrative Patent Judge	)	
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LEE E. BARRETT	)	
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