

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board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. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PAUL D. LITZENBERGER,
JOHN A. FEE,
G. MICHAEL EASTEP, and
ROBERT W. BORN

Appeal No. 2002-1241
Application 08/883,141

ON BRIEF

Before THOMAS, HAIRSTON and KRASS Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-16, all the claims currently pending in the application. The invention is directed to an echo canceller system.

Echo canceller systems are used to reduce or eliminate the presence of reflected voice signals in telephone lines, e.g., in conventional digital voice transmissions. Integrated Services

Digital Network (ISDN) data transmissions do not require echo cancellation. Thus, digital echo cancellers used in conventional telephone networks must be disabled when sending and receiving data and other digital data transmissions using ISDN lines.

While the prior art has addressed this problem, for example, by maintaining individual echo cancellers in a disabled state and merely passing voice signal transmissions through without applying echo cancellation, because each echo canceller is dedicated to a particular voice signal line, a significant percentage of echo cancelling equipment remains unused at all times.

Accordingly, the instant invention provides an echo canceller system for use in a digital telephone transmission system in which echo cancellers are pooled and selectively interconnected by call processing control through a pool switch matrix to individual transmission lines only if the line requires echo cancellation. This is said to permit efficient use of the echo cancellers on an as-needed basis, so a relatively small number of echo cancellers can effectively service a relatively large number of individual transmission lines.

Representative independent claim 1 is reproduced as follows:

1. A dynamic echo canceller system, comprising:

a pool of echo cancellers, each echo canceller having an input and an output;

a pool switch matrix connected in a telecommunications systems, the pool switch matrix having a first set of ports on a first side of the matrix, a second set of ports on an opposite side of the matrix from the first side, and a set of echo canceller ports for connection to the inputs and outputs of the echo cancellers; and

control circuitry directing the pool switch matrix to route selected transmissions between ports of different sets to permit transmission through the pool switch matrix with or without echo cancellation on an as needed basis.

The examiner relies on the following reference:

Reese et al. (Reese) 5,631,958

May 20, 1997
(filed Oct. 4, 1994)

Claims 1, 2, 4 and 7 stand rejected under 35 U.S.C. §102(e) as anticipated by Reese.

Claims 3, 5, 6 and 8-16 stand rejected under 35 U.S.C. §103 as unpatentable over Reese.

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

OPINION

In applying Reese against the instant claimed invention, the examiner contends that in Figure 2 of Reese, echo canceler 34 comprises echo canceler modules which comprise a “pool of echo cancellers.” The examiner also points out that each echo canceler module 46 has an input 64 and an output 66 so that the reference discloses a “pool of echo cancellers, each echo canceller having an input and an output.”

The examiner identifies a “pool switch matrix” in Reese as the cross point switch 44, which has a first set of ports (signal line 54) and a second set of ports (signal line 60). It is the examiner’s position that the claimed “control circuitry directing the pool switch matrix...” is met, in Reese, by CPU 45 which controls operation of the cross point switch 44. The examiner explains, with reference to Figure 2 of Reese, that

DSO signal line 60 (B-channel) is routed to a path multiplexer 56 from a cross point switch 44. If echo canceler is not needed [on the B-channel] the path multiplexer 56 routes the signal line 60 to signal line 62. Alternatively, if echo canceler is required, the path multiplexer 56 routes the signal line 60 to one of available echo canceler modules 46 via a signal line 64 and output on a signal line 66 to signal line 62. See col. 5, lines 37-52 (answer-page 18).

In contrast to the examiner's position, appellants urge that the claimed echo canceller system performs echo cancellation only as needed, while Reese performs the echo cancellation on all received signals.

We have closely reviewed the arguments of both appellants and the examiner, as well as the disclosure of Reese. We conclude that while, at first blush, the examiner's position seems to be supported by Figure 2 of Reese and the disclosure of multiplexer 56 routing signals one way if echo cancellation is required and another way if echo cancellation is not required, we agree with appellants that all received signals in Reese are subjected to echo cancellation so that each signal has an original form and a processed form (i.e., processed by an echo canceller). Then, the multiplexer 56 selects either the unprocessed signal, or the processed signal from an echo canceler module, for placement into each outbound time slot on the basis of whether each corresponding channel is to be processed by an echo canceler module (see column 5, lines 53-57, of Reese).

From the teaching in Reese's abstract, of "selectively enabling or disabling echo cancellation..." and at column 5, lines 26-32,

. . . The CPU 45 monitors the data stream from the parallel access circuit and, in turn, issues configuration control signals to a path multiplexer 56 in order to determine whether each SEND-IN time slot value is to be routed through one of echo canceler modules 46 or whether each SEND-IN time slot is to be routed directly into a SEND-OUT transmission frame, . . .

one might conclude that Reese, also, discloses performing echo cancellation, as needed, as claimed. However, in the next paragraph, at column 5, lines 37-57, it is clearly disclosed that the path multiplexer 56 routes each received B-channel value to a corresponding one of echo canceler modules 46 and that when echo cancellation is disabled on a given B-channel, the path multiplexer 56, in response to a control flag, by routing each incoming value of the corresponding time slot from signal line 60 into a corresponding outbound time slot on signal line 62. But, when echo cancellation is to be applied to a B-channel, the path multiplexer 56 obtains the processed signal (i.e., the signal subjected to echo cancellation in module 46) and multiplexes that processed signal into the appropriate time slot of the outbound transmission frame provided to line 62. Thus, path multiplexer

56 selects either the unprocessed SEND-IN signal, or the processed signal from an echo canceler module, for placement into each outbound time slot on the basis of whether each corresponding channel is to be processed by an echo canceler module.

When lines 37-57 of column 5 are read together with lines 26-32, it becomes clear to us that the former explains exactly how the path multiplexer 56, described in the latter, is routing the signals and that explanation is that each received B-channel value is routed to an echo canceler module so that there is a processed and an unprocessed version of the same signal and one or the other is further routed to the output based on whether echo cancellation has been enabled or disabled. That is, we find no basis for concluding that Reese discloses the passing of an unprocessed signal (i.e., one that has not been subjected to an echo canceler module) without also having a stored version of that signal that has been subjected to echo cancellation.

Accordingly, in contrast to Reese, the instant invention does not select from one of two signals (i.e., processed and unprocessed) but, rather, performs signal processing only on certain signals that require echo cancellation.

The question, of course, is whether the instant claims make this distinction between the instant invention and Reese. We think they do.

Independent claims 1 and 4 each recite, inter alia, the routing of selected transmissions through the pool switch matrix with or without echo cancellation or through echo cancellers “on an as needed basis.” Since Reese has been determined to perform echo cancellation on *all*

received signals, it cannot be said that Reese performs echo cancellation only “on an as needed basis,” as claimed. Again, while Reese may employ either a processed or an unprocessed signal, i.e., either a signal subjected to echo cancellation or the original signal not subject to echo cancellation, Reese still performs an echo cancellation operation on *every* received signal, not merely “on an as needed basis,” as claimed.

Independent claim 8 does not use the term, “on an as needed basis,” but it does make clear that input and output lines are connected or disconnected with “the lines selected for interconnection with echo cancellers being identified as requiring echo cancellation by the call processing system.” Reese does not “identify” such lines because *all* of the received signals are subjected to echo cancellation in Reese.

Finally, with regard to independent claim 12, this claim recites a method wherein a first set of transmissions requiring echo cancellation is identified and a second set of transmissions not requiring echo cancellation is identified and only the first set of transmissions is routed through echo cancellers. Since Reese routes *all* received signals through echo cancellers, Reese does not disclose or suggest the instant claimed subject matter.

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Accordingly, the examiner's decision rejecting claims 1, 2, 4 and 7 under 35 U.S.C. §102(e) and claims 3, 5, 6 and 8-16 under 35 U.S.C. §103 is reversed.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. §136(a).

REVERSED

JAMES D. THOMAS)	
Administrative Patent Judge)	
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KENNETH W. HAIRSTON)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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ERROL A. KRASS)	
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EAK/dpv

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