REMARKS

This is in response to the *Non-Final* Office Action of January 7, 2009, where the Examiner has rejected claims 1-24. An early allowance of outstanding claims 1-24 in view of the following remarks is requested.

A. Objection to Drawings

The Examiner has objected to the drawings, because the reference numeral 232 is not described in the specification. By the present amendment, applicant has amended the specification, as shown above, to cure this informality.

B. Rejection of Claims 1-24 under 35 USC § 101

The Examiner has rejected claims 1-24, under 35 USC § 101, stating that the claimed invention is directed to non-statutory subject matter, because "Neither a physical transformation nor any useful, concrete and tangible result is found ...."

Applicant respectfully disagrees with the Examiner's rejection of claim 1, under 35 USC § 101, because claim 1 provides a real "physical transformation," as shown below:

> canceling said echo signal based on said first bulk delay using said foreground adaptive filter ....

In other words, there is a real physical transformation when an "echo signal" is cancelled by the echo canceller of claim 1. Accordingly, it is respectfully submitted that rejection of claim 1, under 35 USC § 101, is improper. Also, independent claim 13 includes limitations similar to those of claim 1, and claims 2-12 and 14-24 depend on claims 1 and 13, respectively. Therefore, applicant respectfully requests that rejection of claims 1-24, under 35 USC § 101, be withdrawn.

C. **Rejection of Claims 1-24 under 35 USC § 112, ¶ 1**

The Examiner has rejected claims 1-24, under 35 USC § 112, ¶ 1, as failing to comply with the enablement requirement, because "one of ordinary skill in the art would need circuitry or the transform used for filtering to make and/or use the invention." Applicant respectfully disagrees.

It is respectfully submitted that "circuitry or the transform used for filtering" a signal is well within the knowledge of one of ordinary skill in the art, and can be found in many textbooks, patents and publications. In fact, the present Office Action has cited references that discuss filtering a signal, just as in the present application. It is respectfully submitted that applicant has not required any filtering beyond what is know in the art for implementing the invention of claims 1-24. Therefore, applicant respectfully requests that rejection of claims 1-24, under 35 USC § 112, ¶ 1, be withdrawn.

D. **Rejection of Claims 1-4, 7-16 and 19-24 under 35 USC § 103(a)**

The Examiner has rejected claims 1-4, 7-16 and 19-24, under 35 USC § 103(a), as being unpatentable over Ericksson US Patent No. 6,219,418 in view of Roy US Patent No. 5,347,177. For the reasons stated below, applicant respectfully disagrees.

First, claim 1 of the present application recites:

> determining a first bulk delay of an echo signal using a foreground *adaptive* filter, said foreground adaptive filter being a SPARSE filter;
>
> ...
>
> determining a second bulk delay of said echo signal using a background *adaptive* filter, said background adaptive filter being a SPARSE filter ....

Applicant respectfully submits that a key distinction between claim 1 of the present application and Ericksson is that claim 1 of the present application recites that both the foreground and background filters are "adaptive filters." In contrast, both Ericksson and patent no. 3,787,645, which is discussed at columns 3 and 4 of Ericksson, disclose that one filter is an adaptive filter and the other filter is a "programmable filter."

> FIG. 3 illustrates a block diagram of a dual filter echo canceller described in K. Ochiai and U.S. Pat. No. 3,787,645 intended to solve this double-talk problem. Adaptive filter 12 is continuously updated whether there is double-talk or not. However, in this case the output from summation unit 16 is only forwarded to adaptive filter 12 and not to the two-wire line back to far end subscriber A. Instead the actual echo cancellation is performed by a programmable foreground filter 18, which forwards an echo estimate to a summation unit 22, which forwards a resulting error signal $e_2(n)$ to the two-wire line back to far end subscriber A. The coefficients from the adaptive background filter 12 are transferred to the programmable foreground filter 18 whenever the adaptive background filter 12 is considered better than the programmable foreground filter 18. This usually occurs when there is no double-talk. During double-talk the coefficients that were transferred to the programmable foreground filter 18 just before the double-talk situation occurred are kept for echo cancellation during the double-talk period. Once the double-talk situation no longer exists and the adaptive background filter 12 is determined to give better performance, filter coefficients are once again transferred from filter 12 to filter 18.
>
> FIG. 4 illustrates an echo canceller using the method of the present invention. In the echo canceller of FIG. 4 filter 12 is an adaptive filter and filter 18 is a programmable filter, as in the prior art echo canceller of FIG. 3. However, in the echo canceller of FIG. 4 the two filters are used completely in parallel, i.e. residual signals $e_1(n)$ and $e_2(n)$ are obtained for both filters, and a decision logic 24 decides which signal to choose as the actual output signal e(n). Furthermore, as indicated by double arrow 21, both filters may be transferred or copied.

As explained in Ericksson, FIG. 3 shows the approach of patent no. 3,787,645, which uses adaptive filter 12 and "programmable foreground filter 18." Similarly, FIG. 4 of Ericksson describes Ericksson's implementation that also uses adaptive filter 12 and programmable

foreground filter 18. Therefore, unlike claim 1 of the present application, Ericksson does not disclose, teach or suggest an echo cancellation system, where both filters are adaptive.

Even more, since one filter of Ericksson is not an adaptive filter, but a programmable filter, Ericksson naturally fails to show that the background adaptive filter remains in open-loop mode, while the foreground adaptive filter moves from open-loop mode to closed-loop mode. Also, claim 1 recites that both adaptive filters are SPARSE filters. Applicant respectfully submits that there is no disclosure, teaching or suggestion in the cited references that both filters are SPARSE filters.

Accordingly, at least for the reasons stated above, applicant respectfully submits that claim 1 is patentably distinguishable over the cited references, and should be allowed. Further, independent claim 13 includes limitations similar to those of claim 1, and claims 2-4, 7-12, 14-16 and 19-24, depend from claims 1 and 13, respectively, and should be allowed for the reasons stated above.

E. Rejection of Claims 5-6 and 17-18 under 35 USC § 103(a)

The Examiner has rejected claims 5-6 and 17-18, under 35 USC § 103(a), as being unpatentable over Ericksson in view of Roy, and further in view of Yatrou US Patent No. 5,343,522.

Applicant respectfully submits that claims 5-6 and 17-18 depend from independent claims 1 and 13, respectively, and should be allowed at least for the reasons stated above in conjunction with patentability of claims 1 and 13, as amended.

F. Conclusion

Based on the foregoing reasons, an early Notice of Allowance directed to all claims 1-24 pending in the present application is respectfully requested.

Respectfully Submitted,
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