



[54] VITERBI EQUALIZER AND RECORDING/REPRODUCING DEVICE USING THE SAME

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[30] Foreign Application Priority Data

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[51] Int. Cl.⁵ G06F 11/10

[52] U.S. Cl. 371/43

[58] Field of Search 371/43, 44, 37.1, 37.2, 37.1/37.3, 37.4, 37.6, 37.7, 37.8, 37.9, 43, 44

[56] References Cited

U.S. PATENT DOCUMENTS

4,763,328	0/1988	Shimoda et al.	371/3
4,823,346	4/1989	Kobayashi et al.	371/43
4,870,414	9/1989	Karabed et al.	341/57
4,945,538	7/1990	Patel	371/43
5,042,036	8/1991	Fettweis	371/43
5,136,593	8/1992	Moon et al.	371/43
5,257,272	10/1993	Fredrickson	371/43

OTHER PUBLICATIONS

Shung et al "Area-Efficient Architectures for the Viterbi Algorithm" IEEE 1990 pp. 1787-1793.
 Fredrickson et al "Error Detecting Multiple Block (d,k) Codes" IEEE Trans. on Magnetics vol. 25 No. 5 Sep. 1989.
 French et al, "Performance Comparison of Combined ECC/RLL Codes" IEEE 1990 pp. 1717-1722.
 Mouldin et al, "A New Path Metric for Survivable Circuit Switched Routing" IEEE 1989 pp. 0688-0692.
 French "Distance Preserving Run-lengthy Limited

Codes" IEEE Transactions on Magnetics, vol. 25 No. 5 Sep. 1989.

Lin et al "Combined ECC/RLL Codes" IEEE Transactions on Magnetics vol. 24, No. 6, Nov. 1988.

Francis R. Magree, Jr. et al., "Adaptive Maximum-Likelihood Sequence Estimation for Digital Signaling in the Presence of Intersymbol Interference", IEEE Transaction of Information Theory, Jan. 1973, pp. 120-124.

W. Toms et al., "Maximum-Likelihood Sequence Estimation of Diginal Sequences in the Presence of Intersymbol Interference", IEEE Transactions of Information Theory, Jan. 1972, pp. 363-378.

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[57] ABSTRACT

A viterbi equalizer includes a distributor for receiving a run length limited code and for calculating branch metrics responsive to the run length limited code. The branch metrics are related to only nodes and branches in a trellis state transition diagram based on a viterbi decoding algorithm defined for the run length limited code. The viterbi equalizer also includes a path metric calculating circuit, operatively coupled to the distributor, for generating path metrics on the basis of the branch metrics and for generating path select signals indicative of surviving paths coupling the nodes and branches. Further, the viterbi equalizer includes a path memory, operatively coupled to the path metric calculating circuit, for determining a maximum likelihood path on the basis of the path select signals output by the path metric calculating circuit.

10 Claims, 12 Drawing Sheets

114

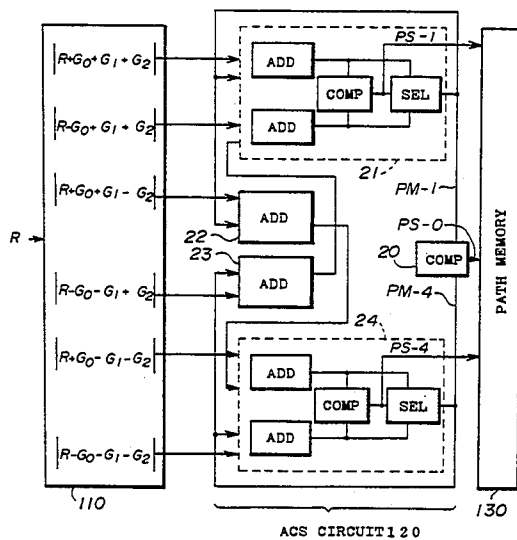


FIG. 1 PRIOR ART

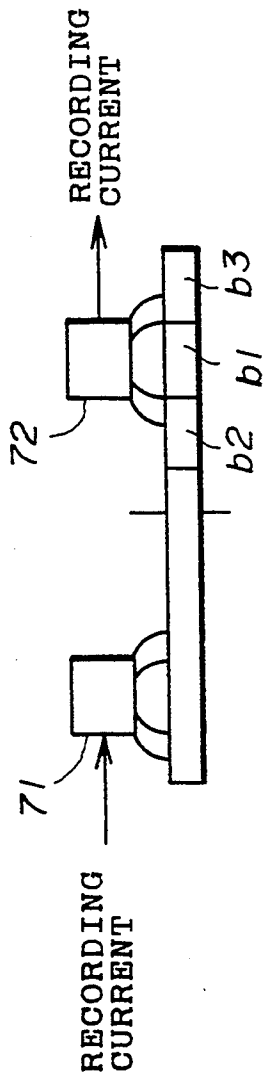


FIG. 2 PRIOR ART

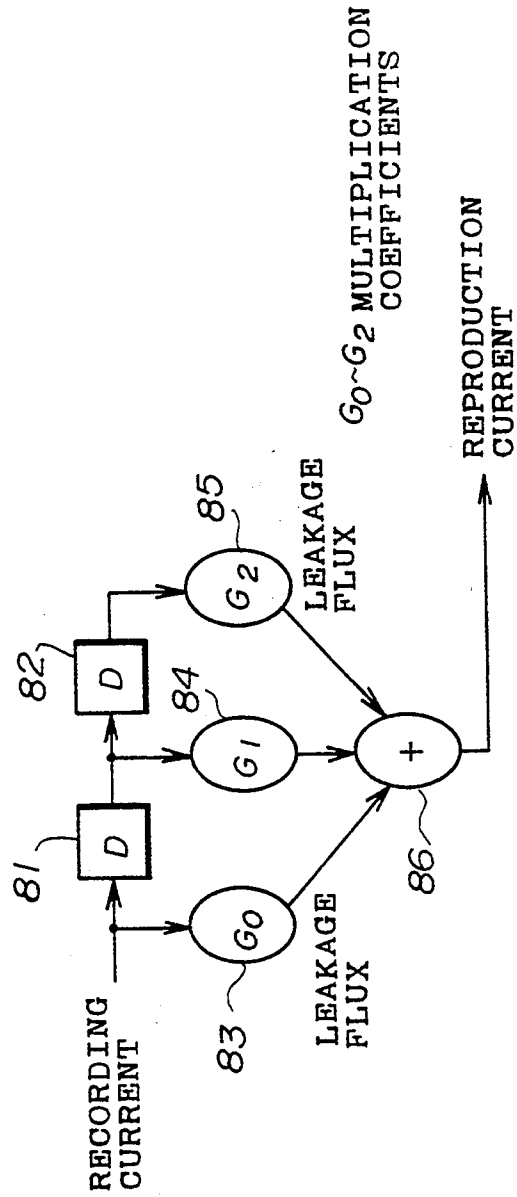


FIG. 3 PRIOR ART

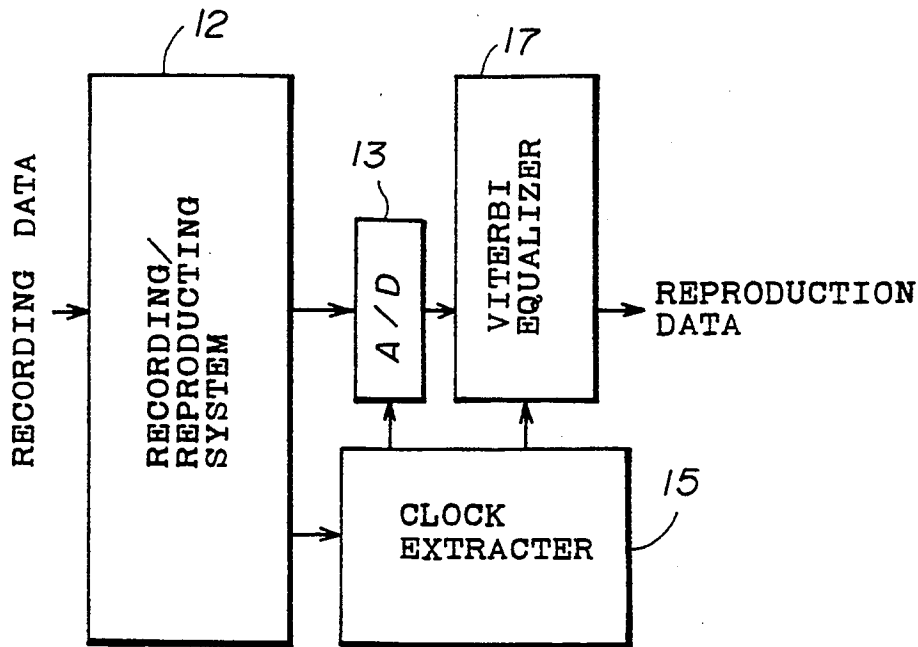


FIG. 4 PRIOR ART

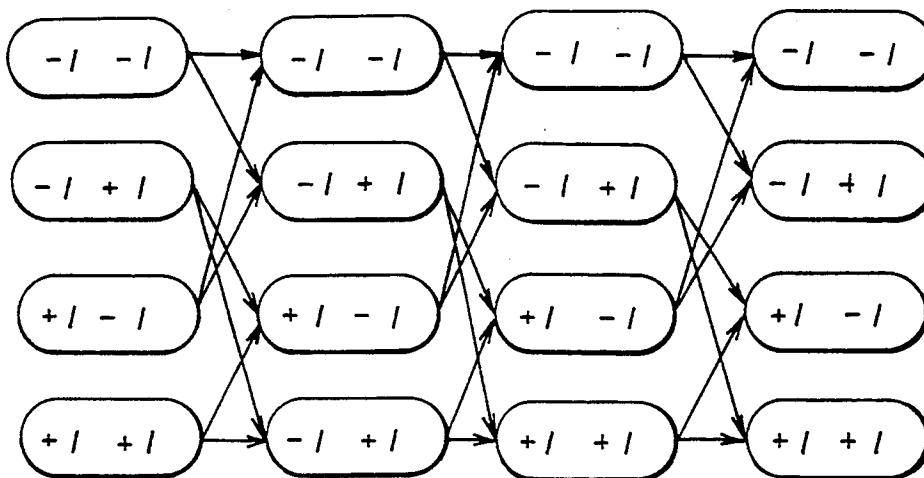


FIG. 5 PRIOR ART

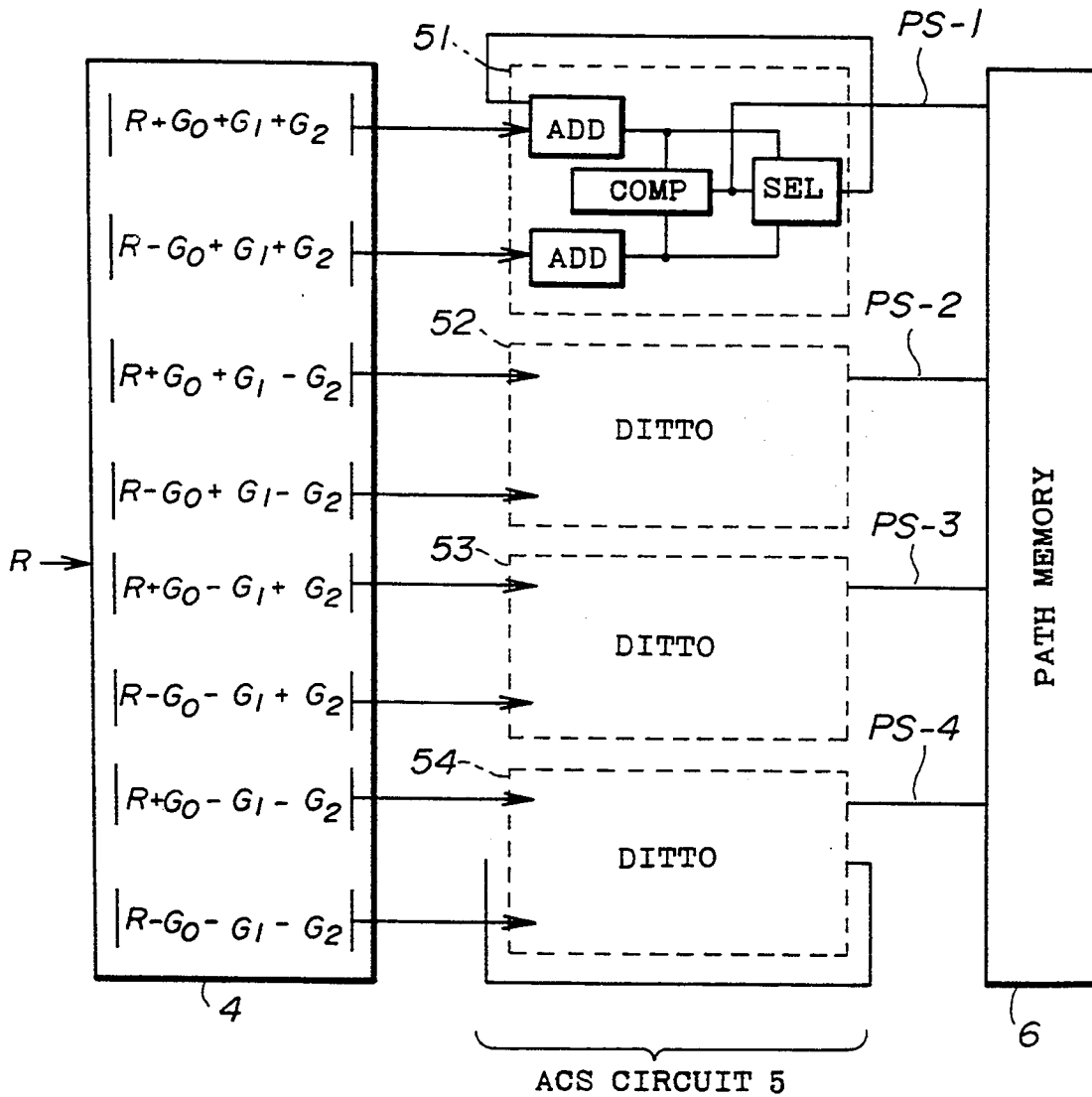
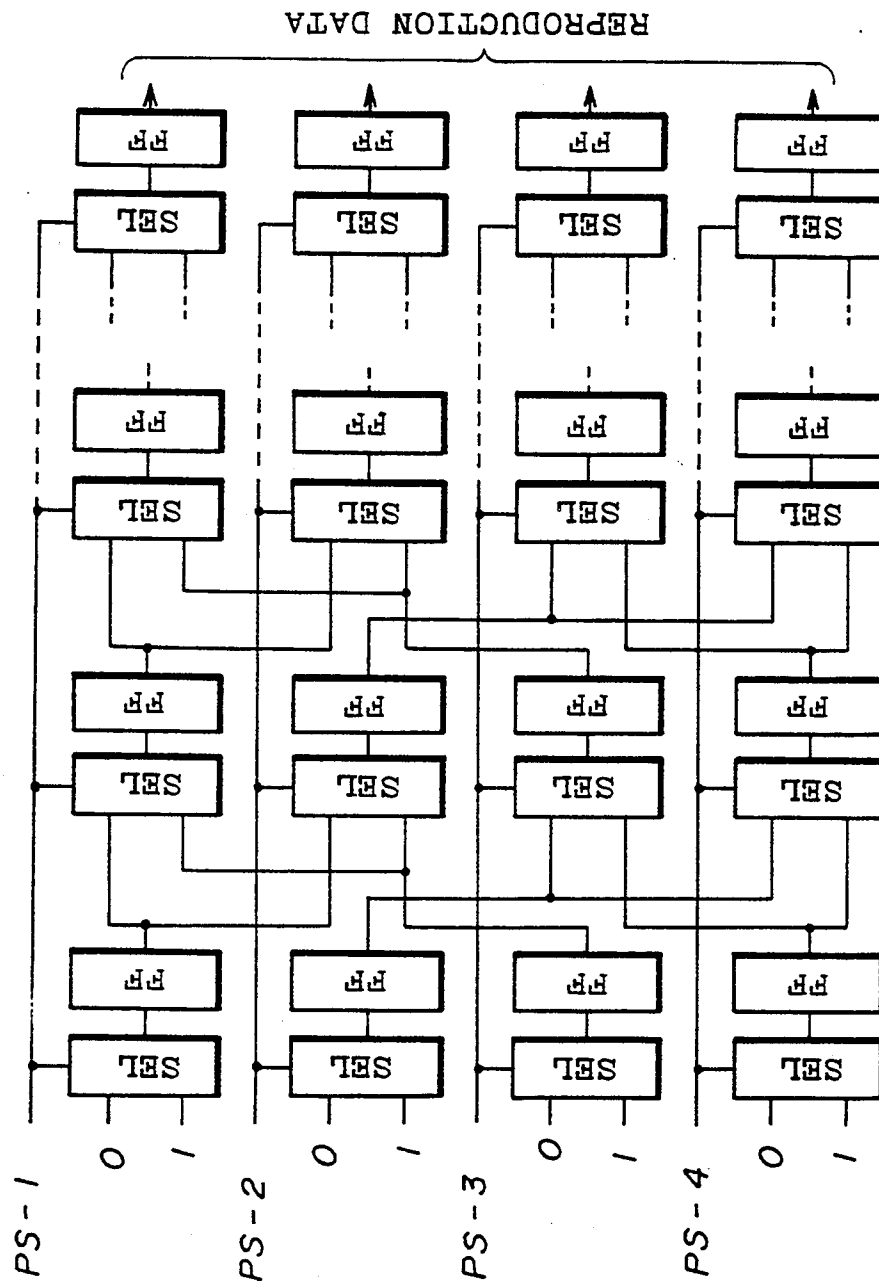


FIG. 6 PRIOR ART



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