



[54] **SYSTEM AND METHOD FOR ERROR CORRECTING A RECEIVED DATA STREAM IN A CONCATENATED SYSTEM**

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[21] Appl. No.: **08/840,383**

[22] Filed: **Apr. 28, 1997**

[51] **Int. Cl.<sup>7</sup>** ..... **H03M 13/00**

[52] **U.S. Cl.** ..... **714/755**

[58] **Field of Search** ..... **714/755, 752; 371/37.4, 43.7**

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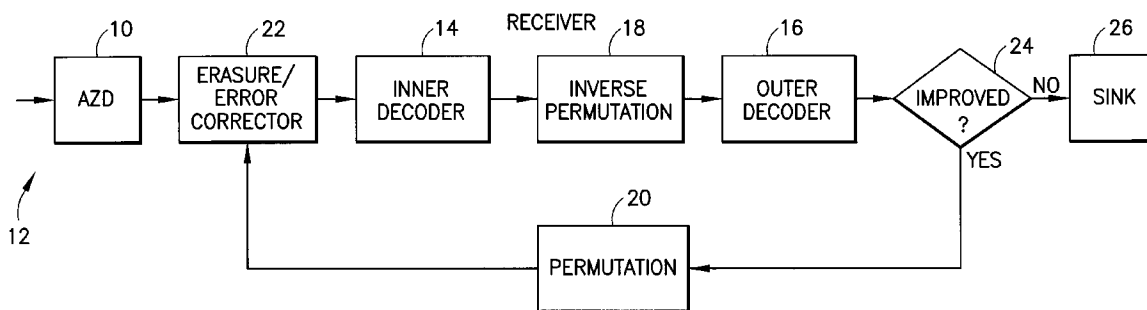
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*Primary Examiner*—Albert De Cady  
*Assistant Examiner*—Shelly A Chase

[57] **ABSTRACT**

A received signal is first converted into a digital sequence that may contain "erasures" (or ambiguity symbols) as well as errors. Then iterative decoding is applied in order to eliminate or reduce the erasures. This decoding procedure works effectively with the associated transmitter that adopts a concatenation of an outer coder, a permutation and an inner coder. The principal of the invention is also applicable to a system in which the inner coder is replaced by a "digital modulator" that introduces some constraint, or a channel that introduces some memory such as partial response signaling, intersymbol interference or multipath propagation. The invention can be applied to many existing systems while maintaining "backward compatibility" in the sense that the transmitter side need not be modified.

**12 Claims, 14 Drawing Sheets**



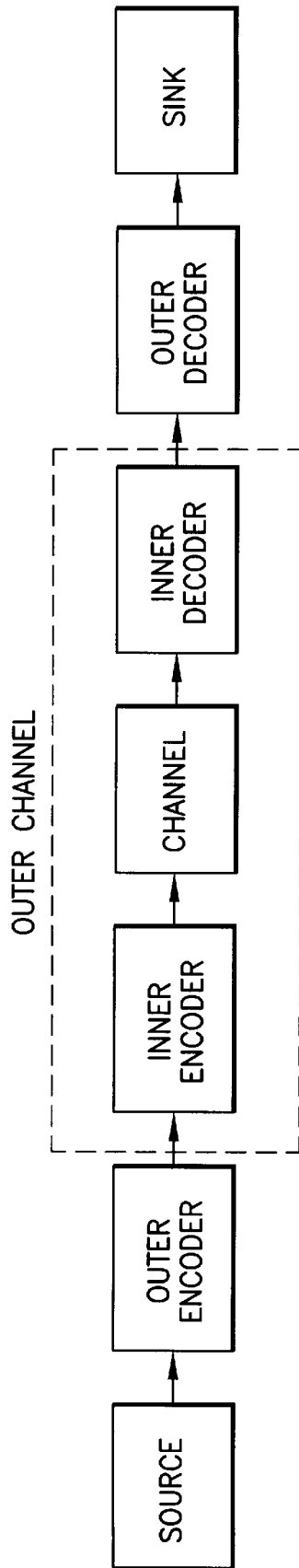


FIG. 1  
PRIOR ART

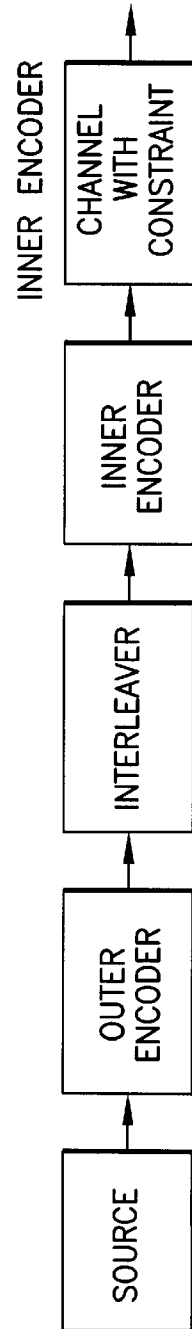


FIG. 3

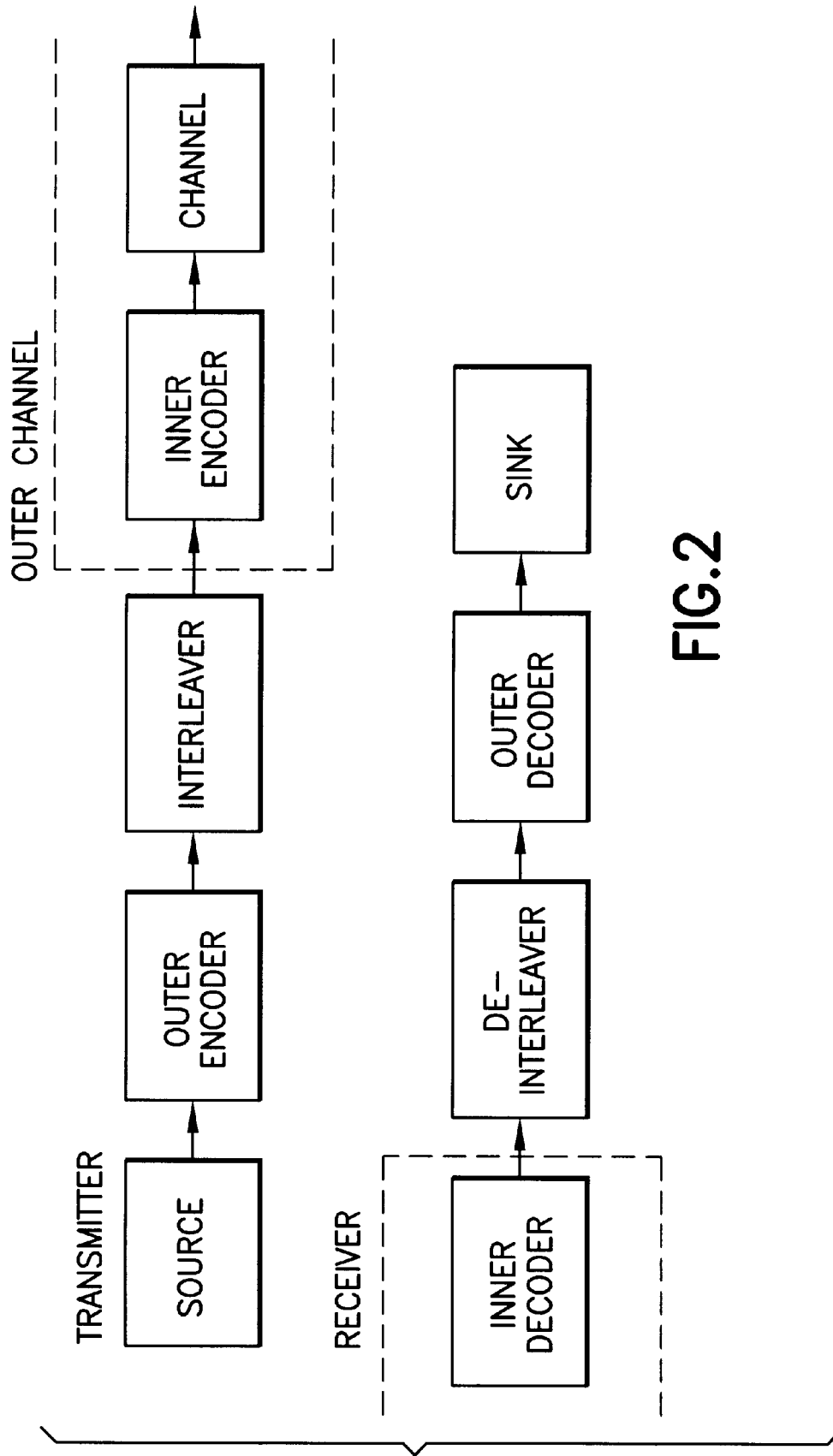


FIG.2

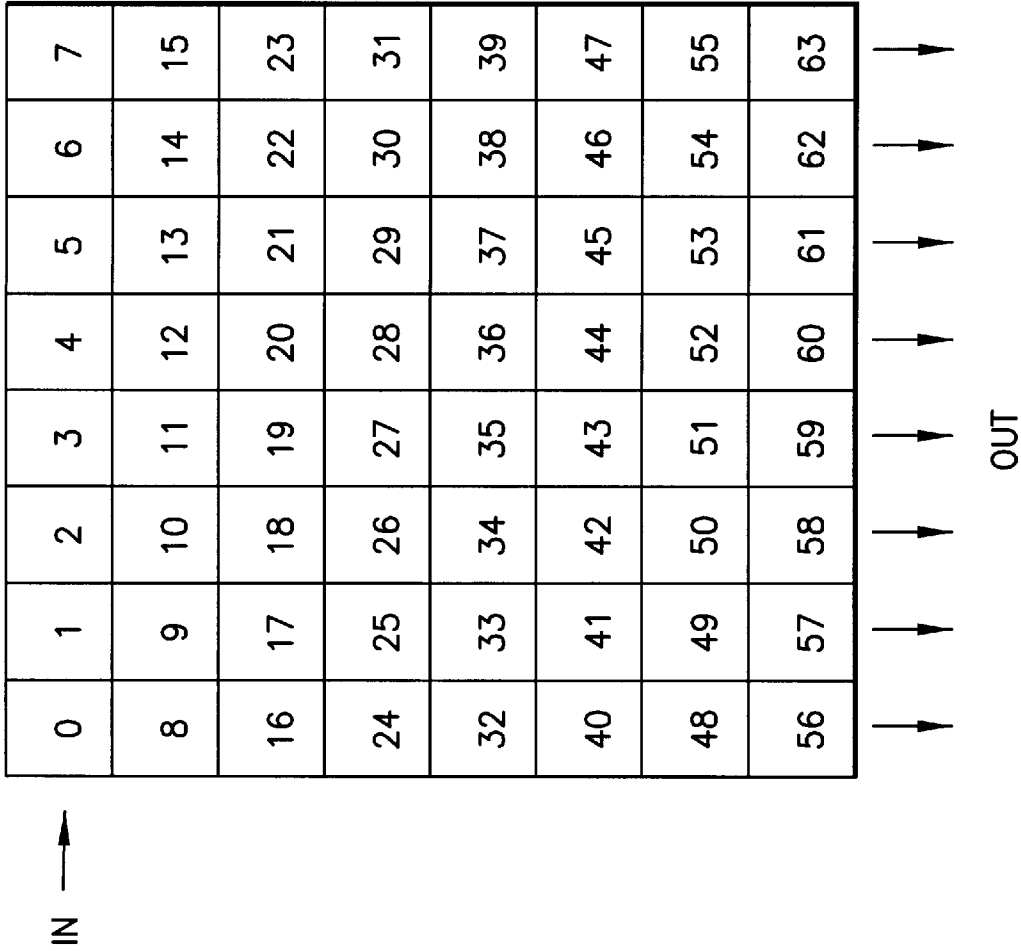


FIG.2A

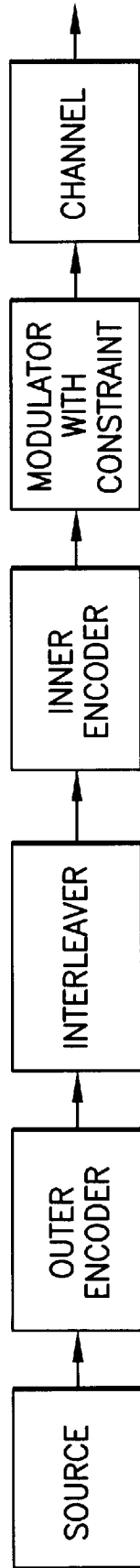


FIG. 4

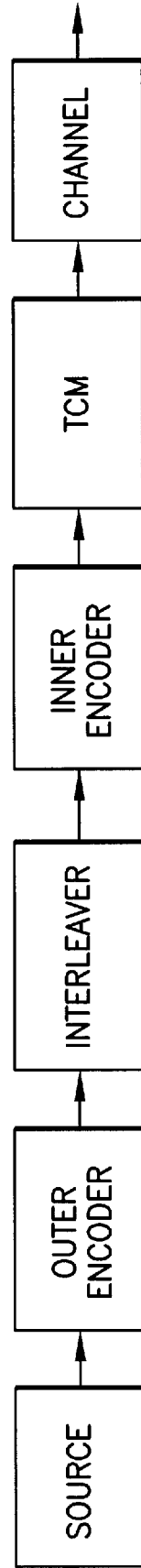


FIG. 5

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