

(12) **United States Patent**  
**Jin et al.**

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(54) **SERIAL CONCATENATION OF INTERLEAVED CONVOLUTIONAL CODES FORMING TURBO-LIKE CODES**

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**Related U.S. Application Data**

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(51) **Int. Cl.**  
*H04L 5/12* (2006.01)

(52) **U.S. Cl.** 375/262; 375/265; 375/348; 714/755; 714/786; 714/792; 341/52; 341/102

(58) **Field of Classification Search** 375/259, 375/262, 265, 285, 296, 341, 346, 348; 714/746, 714/752, 755, 756, 786, 792, 794-796; 341/51, 341/52, 56, 102, 103

See application file for complete search history.

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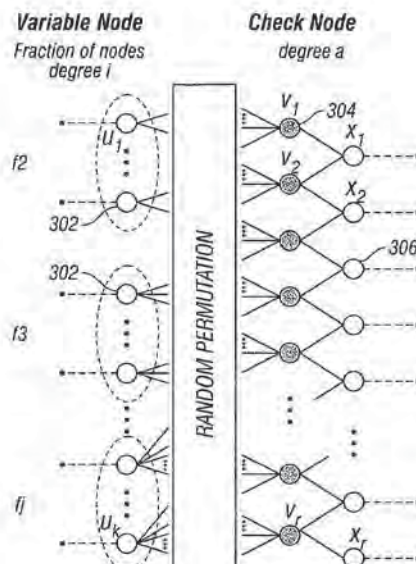
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(57) **ABSTRACT**

A serial concatenated coder includes an outer coder and an inner coder. The outer coder irregularly repeats bits in a data block according to a degree profile and scrambles the repeated bits. The scrambled and repeated bits are input to an inner coder, which has a rate substantially close to one.

**23 Claims, 5 Drawing Sheets**





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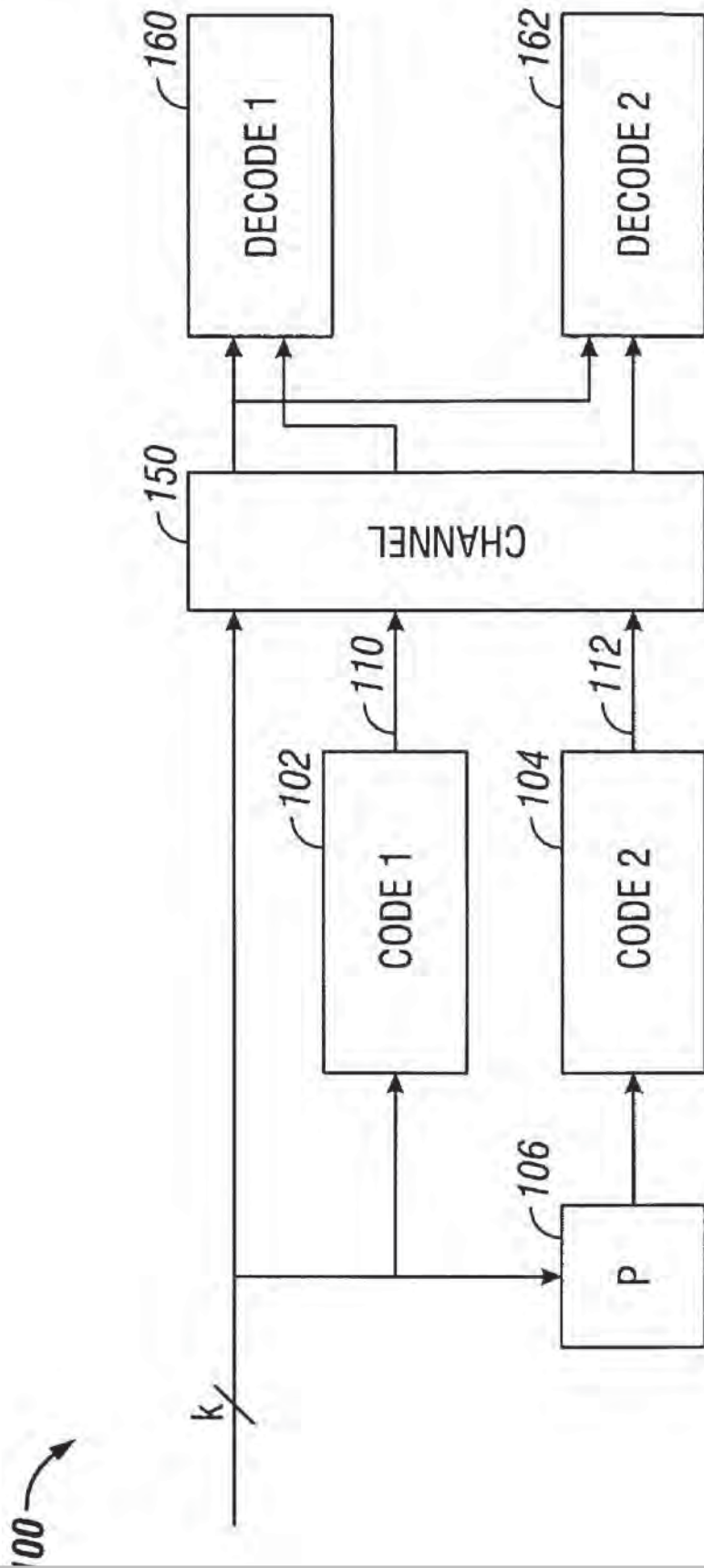
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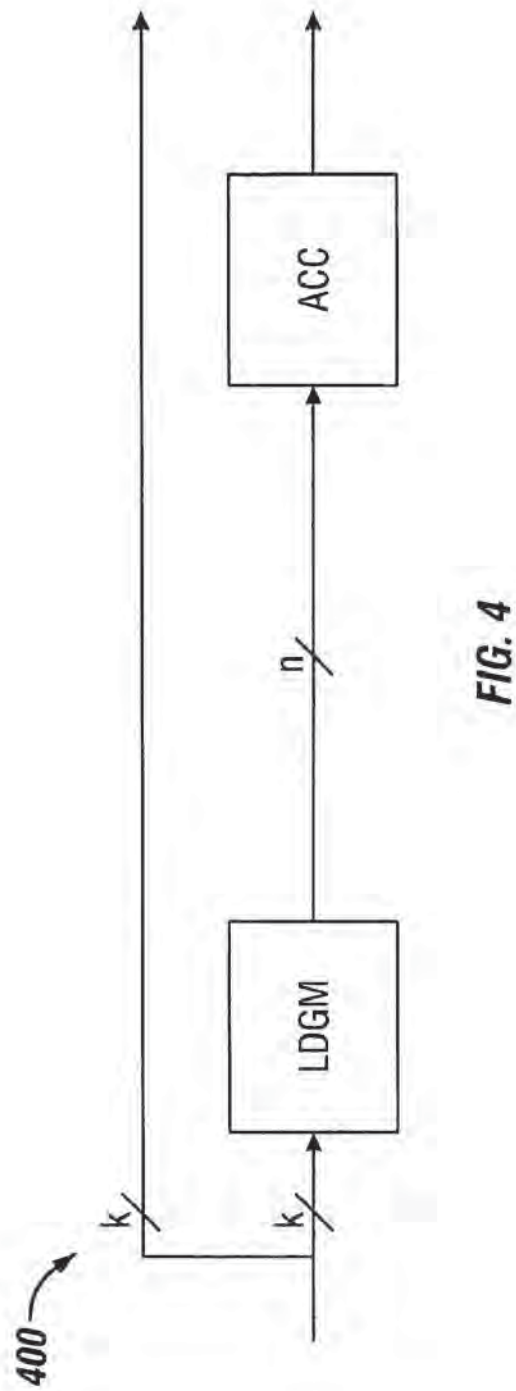
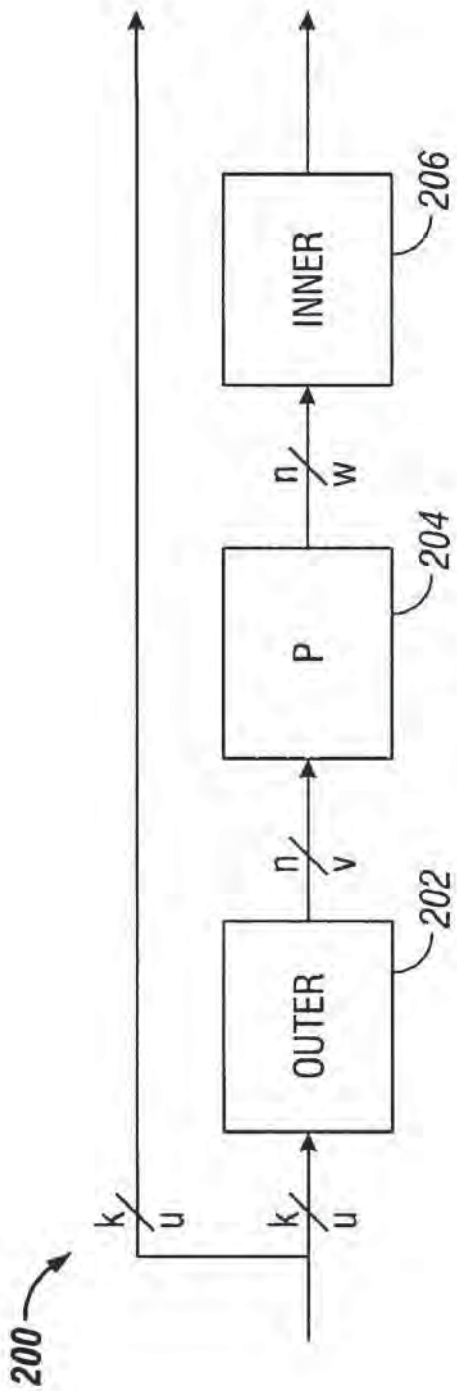
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**FIG. 1**  
*(Prior Art)*



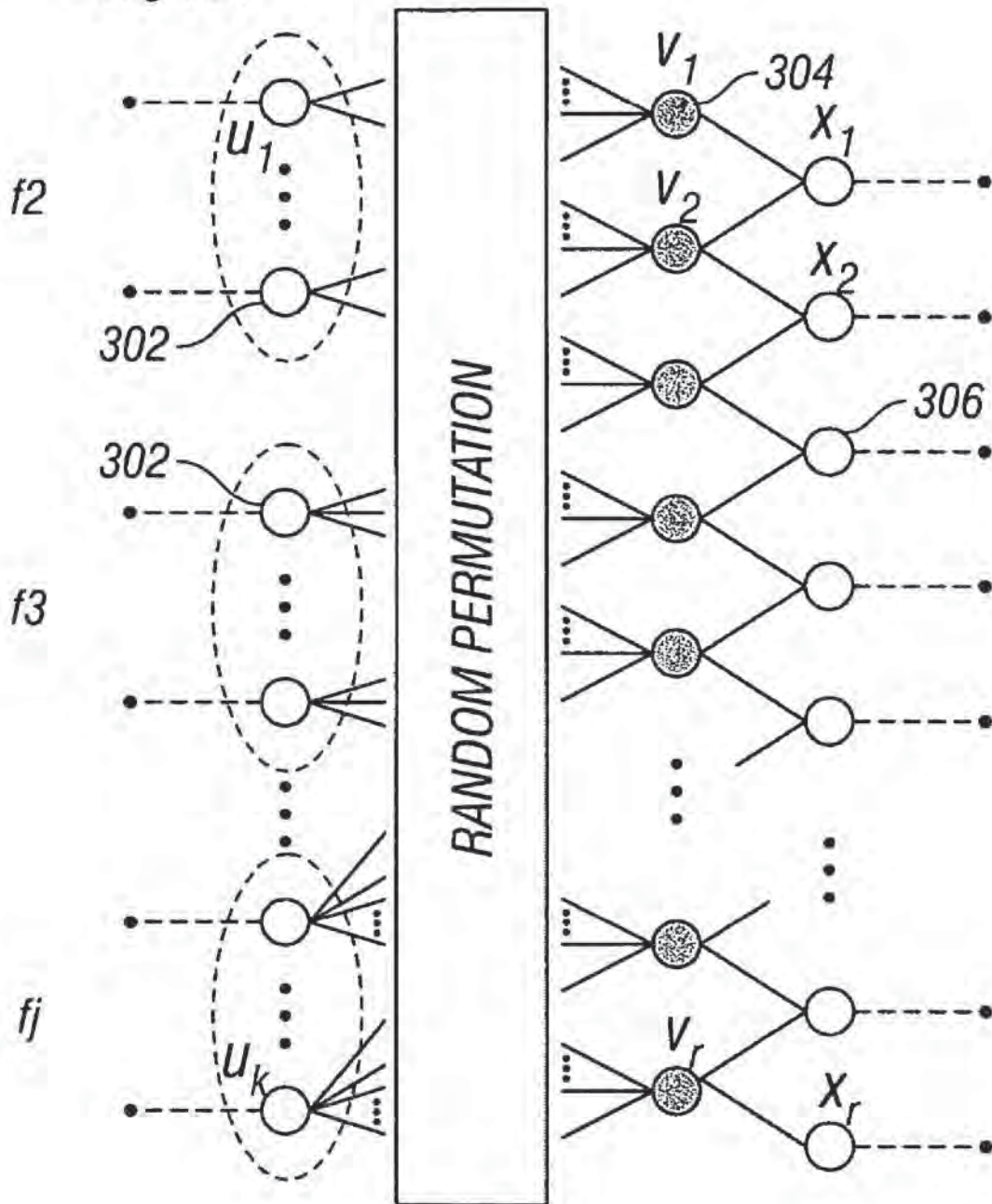


**Variable Node**

Fraction of nodes  
degree  $i$

**Check Node**

degree  $a$



**FIG. 3**

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