EXHIBIT C

US007916781B2

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

(10) **Patent No.: US 7,916,781 B2**
(45) **Date of Patent: Mar. 29, 2011**

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

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(73) Assignee: **California Institute of Technology**, Pasadena, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 424 days.

(21) Appl. No.: **12/165,606**

(22) Filed: **Jun. 30, 2008**

(65) **Prior Publication Data**

US 2008/0294964 A1 Nov. 27, 2008

Related U.S. Application Data

(63) Continuation of application No. 11/542,950, filed on Oct. 3, 2006, now Pat. No. 7,421,032, which is a continuation of application No. 09/861,102, filed on May 18, 2001, now Pat. No. 7,116,710, which is a continuation-in-part of application No. 09/922,852, filed on Aug. 18, 2000, now Pat. No. 7,089,477.

(60) Provisional application No. 60/205,095, filed on May 18, 2000.

(51) **Int. Cl.**
H04B 1/66 (2006.01)

(52) **U.S. Cl.** **375/240**; 375/285; 375/296; 714/801; 714/804

(58) **Field of Classification Search** 375/240, 375/240.24, 254, 285, 295, 296, 260; 714/755, 714/758, 800, 801, 804, 805
See application file for complete search history.

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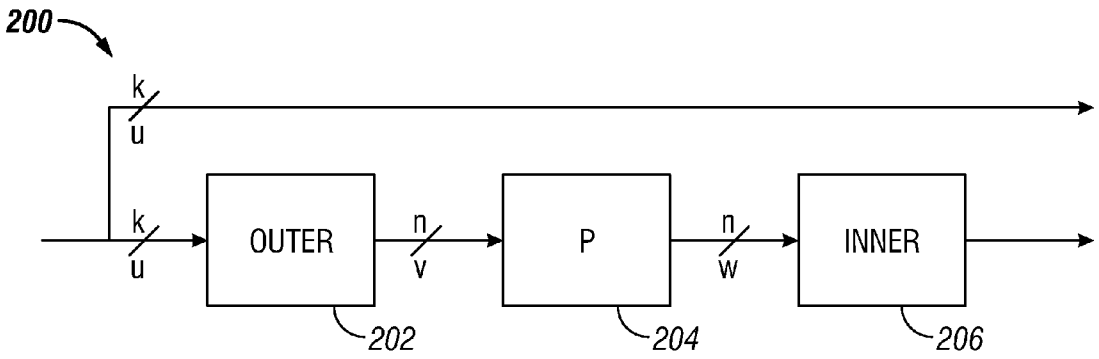
Primary Examiner — Dac V Ha
(74) *Attorney, Agent, or Firm* — Perkins Coie LLP

(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.

22 Claims, 5 Drawing Sheets



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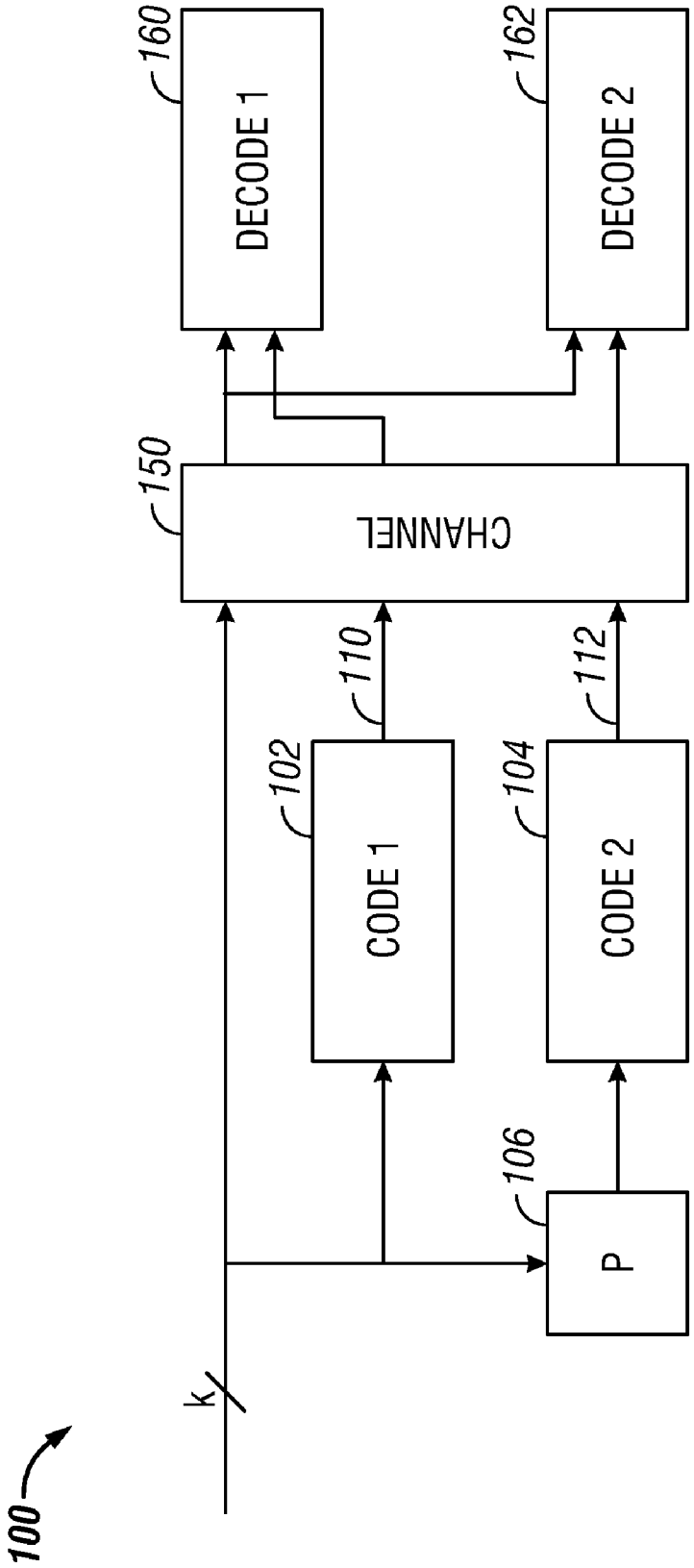

FIG. 1
(Prior Art)

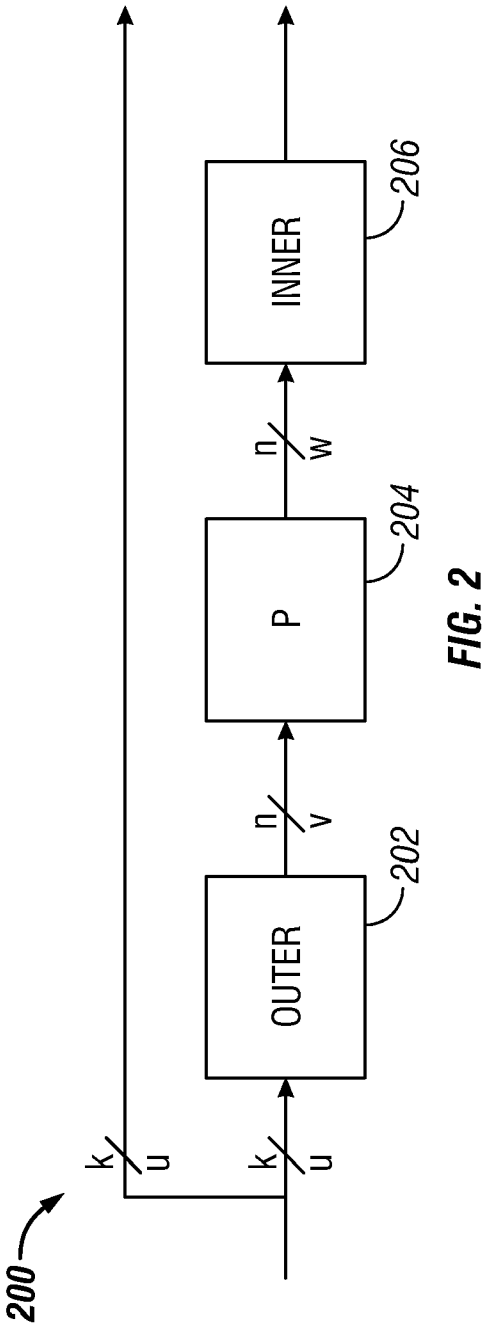

FIG. 2

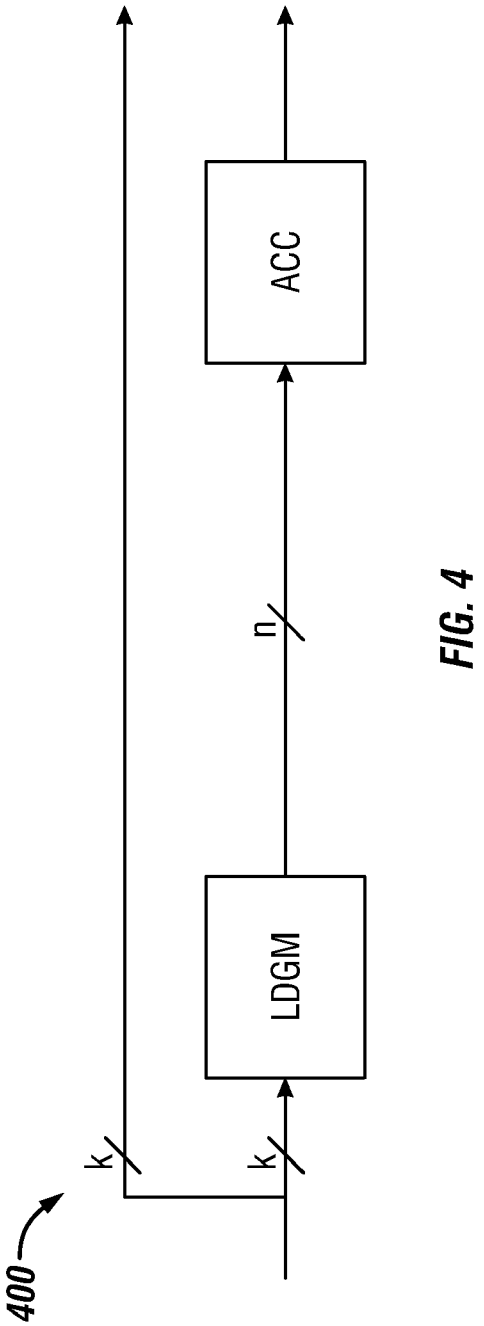

FIG. 4

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