CLAIMS

1. A data transmission method, wherein the method comprises:

performing convolutional interleaving on symbols comprised in a plurality of first codewords, to obtain an interleaving result, wherein the interleaving result comprises n first bit groups, and the first codeword is encoded with a first forward error correction (FEC) code;

encoding bits corresponding to the n first bit groups with a second FEC code, to obtain n second codewords, wherein a quantity of bits corresponding to the n first bit groups is equal to a quantity of bits comprised in information bits of the n second codewords, n is a positive integer.

2. The method according to claim 1, wherein four adjacent symbols of the interleaving result are respectively from different first codewords.

3. The method according to claim 1 or 2, wherein the second code comprises codeword boundary information, the codeword boundary information indicates the start interleaving location at which the convolutional interleaving is performed on the symbols comprised in the plurality of first codewords.

4. The method according to any one of claims 1 to 3, wherein the first FEC code is a Reed-Solomon (RS) code, a Bose-Chaudhuri-Hocquenghem (BCH) code, an extended BCH code, a Hamming code, an extended Hamming code, a staircase code, a low-density parity-check (LDPC) code, a turbo code, or a turbo product code (TPC).

5. The method according to any one of claims 1 to 4, wherein the second FEC code is a Reed-Solomon (RS) code, a Bose-Chaudhuri-Hocquenghem (BCH) code, an extended BCH code, a Hamming code, an extended Hamming code, a staircase code, a low-density parity-check (LDPC) code, a turbo code, or a turbo product code (TPC).

6. The method according to any one of claims 1 to 5, wherein the performing convolutional interleaving on symbols comprised in a plurality of obtained first codewords, to obtain an interleaving result comprises:

performing, via a plurality of delay units of a convolution interleaver, convolutional interleaving on the symbols that are comprised in the plurality of first codewords and that are input in a round robin manner, to obtain the interleaving result.

7. The method according to claim 6, wherein one first bit group comprises symbols that are output by the plurality of delay units through round robin for one time.

8. The method according to claim 7, wherein the symbols that are output by the plurality of delay lines through round robin for one time are located in a same column.

9. The method according to any one of claims 6 to 8, wherein a start interleaving location of the convolutional interleaving is in a first delay unit numbered sequentially in the plurality of delay units.

10. The method according to any one of claims 6 to 9, wherein the plurality of delay units are a plurality of delay lines.

11. The method according to claim 10, wherein a quantity of bits corresponding to a delay block included in each delay line is 40 bits.

12. The method according to any one of claims 1 to 11, wherein a start interleaving location at which the convolutional interleaving is performed on the symbols included in the plurality of first codewords is a round robin start location at which the symbols of the first codewords are input through round robin.

13. The method according to any one of claims 1 to 12, wherein the symbols comprised in the plurality of first codewords are input into the plurality of first delay units of the convolution interleaver in a manner of a first data stream, and a transmission rate of the first data stream is greater than or equal to 100 gigabits per second (Gbps).

14. The method according to claim 13, wherein the transmission rate of the first data stream is greater than or equal to 200 Gbps.

15. The method according to claim 13 or 14, wherein the first data stream is transmitted to the plurality of first delay units of the convolution interleaver through at least one lane of an attachment unit interface (AUI).

16. A data transmission method, wherein the method comprises:

receiving n second codewords, the n second codewords are obtained by encoding bits corresponding to n first bit groups with a second forward error correction (FEC) code, wherein a quantity of bits corresponding to the n first bit groups is equal to a quantity of bits comprised in information bits of the n second codewords, n is a positive integer；

decoding the n second codewords, to obtain the n first bit groups；

performing convolutional de-interleaving on bits corresponding to the n first bit groups, to obtain a plurality of first codewords, the first codeword is encoded with a first FEC code.

17. A first data transmission apparatus, configured to implement the method of any one of claims 1 to 15.

18. A second data transmission apparatus, configured to implement the method of claim 16.

19. A system, comprising:

a first data transmission apparatus, configured to implement the method of any one of claims 1 to 15; and

a second data transmission apparatus, configured to implement the method of claim 16.