



US 20220360280A1

(19) **United States**

(12) **Patent Application Publication**
Flynn et al.

(10) **Pub. No.: US 2022/0360280 A1**

(43) **Pub. Date: Nov. 10, 2022**

(54) **LOW-LATENCY ENCODING USING A
BYPASS SUB-STREAM AND AN ENTROPY
ENCODED SUB-STREAM**

(71) Applicant: **Apple Inc.**, Cupertino, CA (US)

(72) Inventors: **David Flynn**, Muchen (DE);
Alexandros Tourapis, Los Gatos, CA
(US); **Khaled Mammou**, Danville, CA
(US)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(21) Appl. No.: **17/814,487**

(22) Filed: **Jul. 22, 2022**

Related U.S. Application Data

(63) Continuation of application No. 17/061,411, filed on
Oct. 1, 2020, now Pat. No. 11,398,833.

(60) Provisional application No. 62/909,691, filed on Oct.
2, 2019.

Publication Classification

(51) **Int. Cl.**
H03M 7/40 (2006.01)

(52) **U.S. Cl.**
CPC **H03M 7/4006** (2013.01)

(57) **ABSTRACT**

A system comprises an encoder configured to entropy encode a bitstream comprising both compressible and non-compressible symbols. The encoder parses the bitstream into a compressible symbol sub-stream and a non-compressible sub-stream. The non-compressible symbol sub-stream bypass an entropy encoding component of the encoder while the compressible symbol sub-stream is entropy encoded. When a quantity of bytes of entropy encoded symbols and bypass symbols is accumulated a chunk of fixed or known size is formed using the accumulated entropy encoded symbol bytes and the bypass bytes without waiting on the full bitstream to be processed by the encoder. In a complementary manner, a decoder reconstructs the bitstream from the packets or chunks.

