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(12) **United States Patent**
O'Connor et al.

(10) **Patent No.:** **US 6,591,058 B1**
(45) **Date of Patent:** **Jul. 8, 2003**

(54) **TIME SHIFTING BY CONCURRENTLY RECORDING AND PLAYING A DATA STREAM**

(58) **Field of Search** 386/4, 1, 52, 53, 386/55, 57, 65, 68, 46, 69, 95, 107, 117, 6, 109; 345/723; H04N 5/91, 5/93

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(56) **References Cited**
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(73) Assignee: **Intel Corporation**, Santa Clara, CA (US)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

Yeo et al., "Rapid Scene Analysis on Compressed Video", IEEE Transactions on Circuits and Systems for Video Technology, vol. 5, No. 6, Dec. 1995, pp. 533-544.

* cited by examiner

(21) Appl. No.: **09/343,870**

Primary Examiner—Robert Chevalier

(22) Filed: **Jun. 30, 1999**

(74) *Attorney, Agent, or Firm*—Trop, Pruner & Hu, P.C.

Related U.S. Application Data

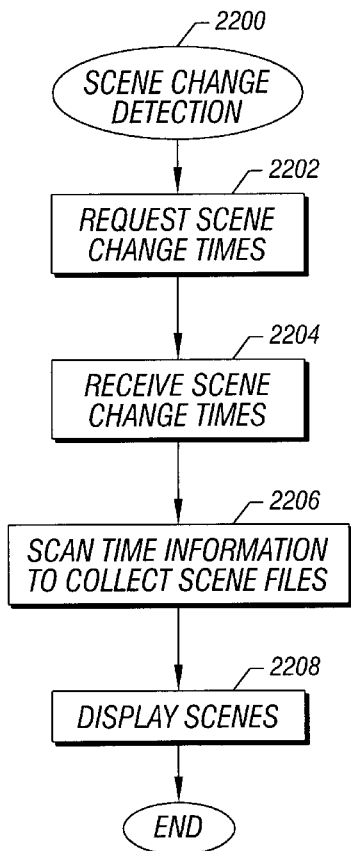
(57) **ABSTRACT**

(63) Continuation-in-part of application No. 09/150,577, filed on Sep. 10, 1998, which is a continuation-in-part of application No. 08/996,535, filed on Dec. 23, 1997, now Pat. No. 6,480,667.

A video stream may include portions that are stored while other portions are being displayed. In one embodiment, a portion of the video stream may be stored in digital storage media at one instance while in the next instance another portion of the stream is being read out of the storage media.

(51) **Int. Cl.**⁷ **H04N 5/91; H04N 5/93**
(52) **U.S. Cl.** **386/65; 386/52**

16 Claims, 23 Drawing Sheets



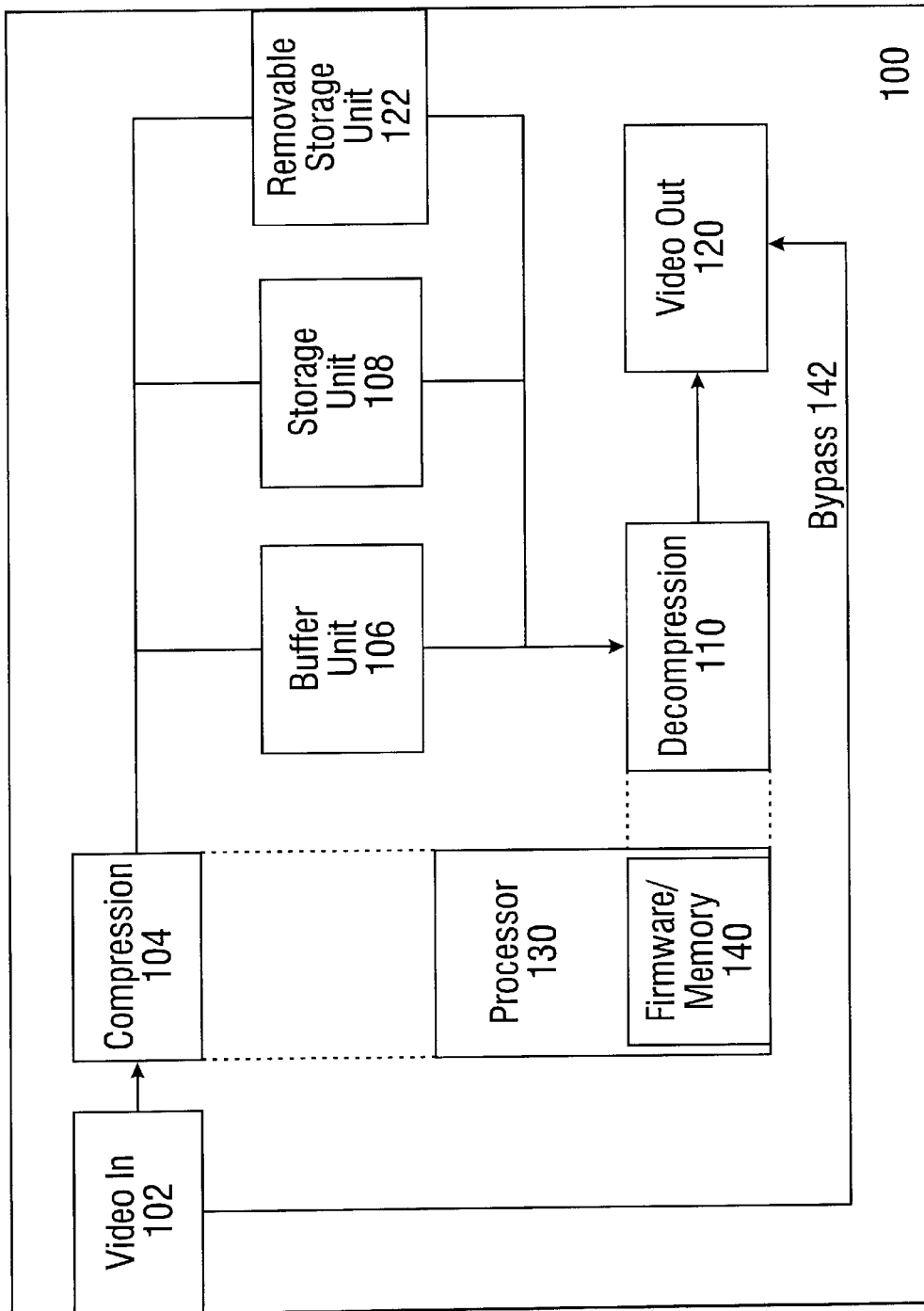
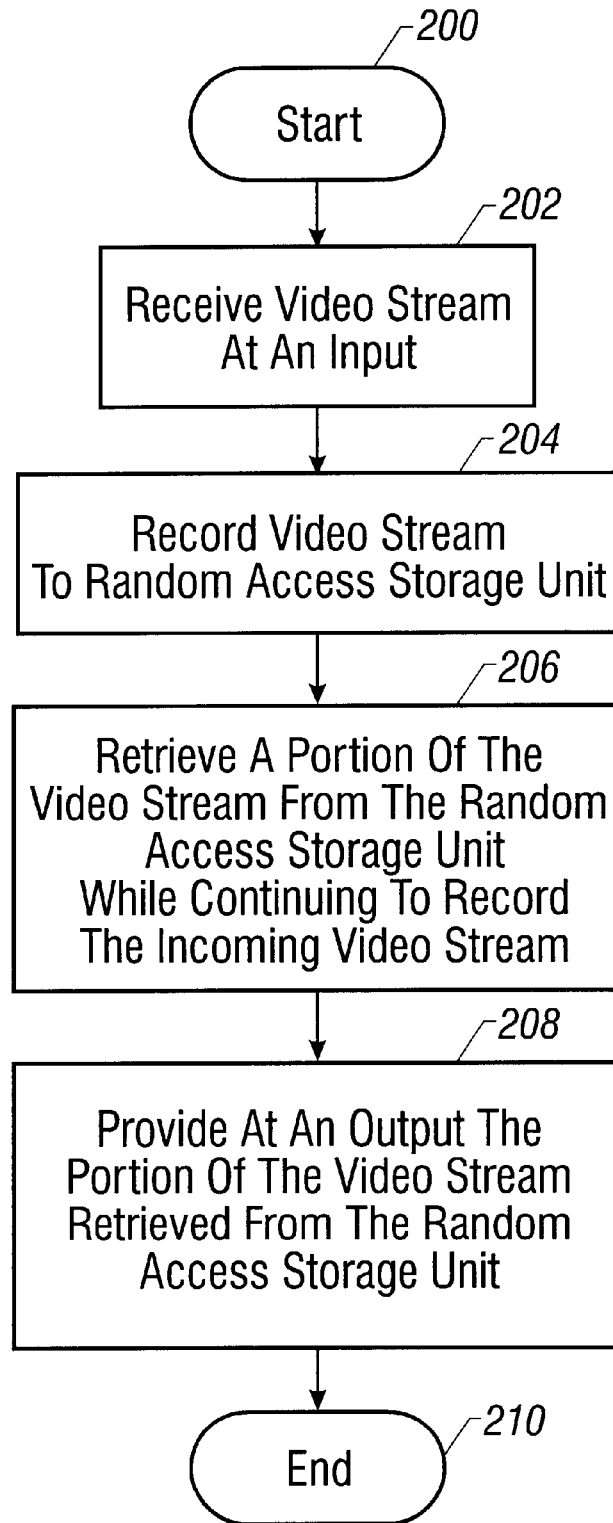


FIG. 1

**FIG. 2**

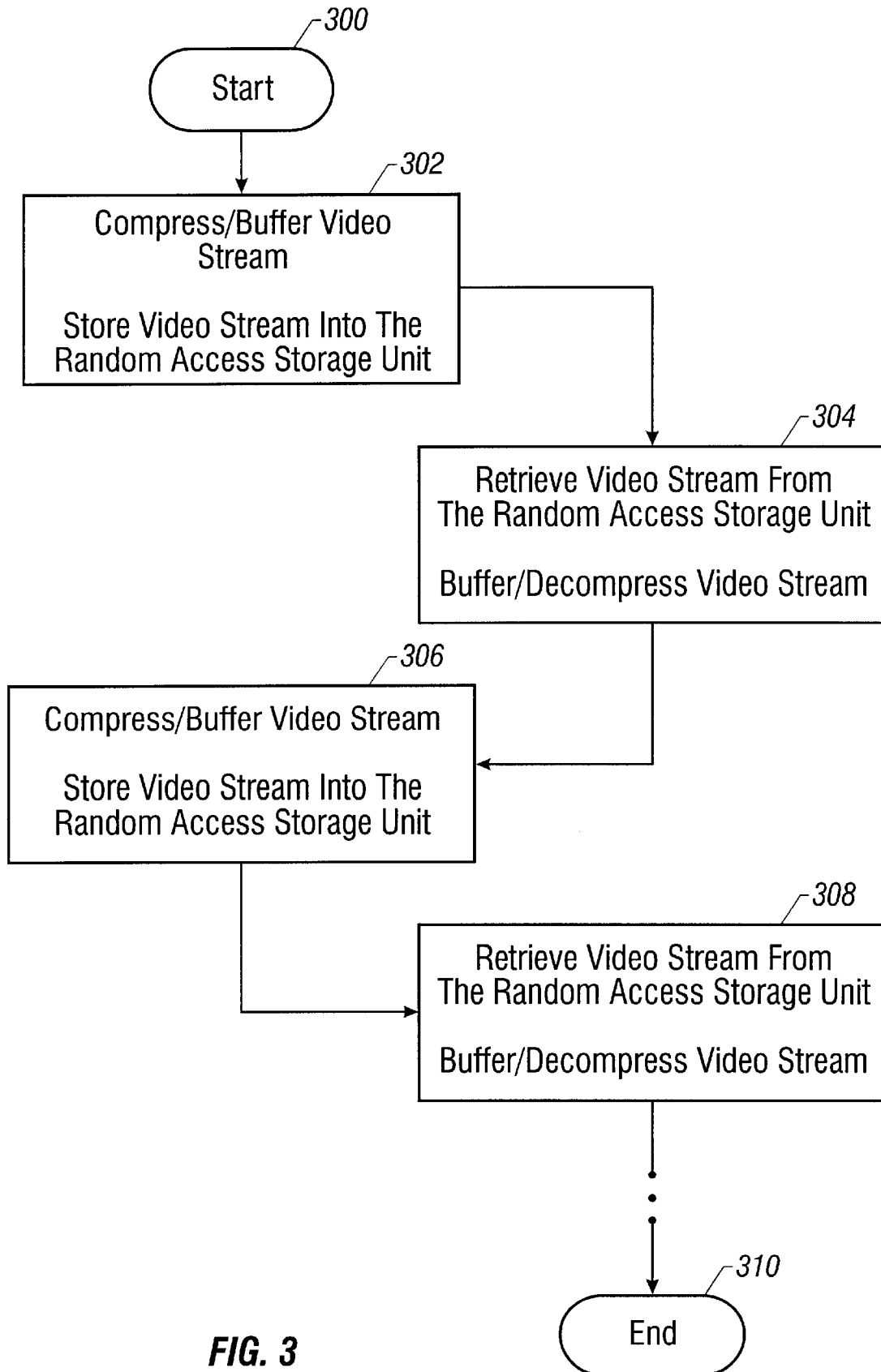


FIG. 3

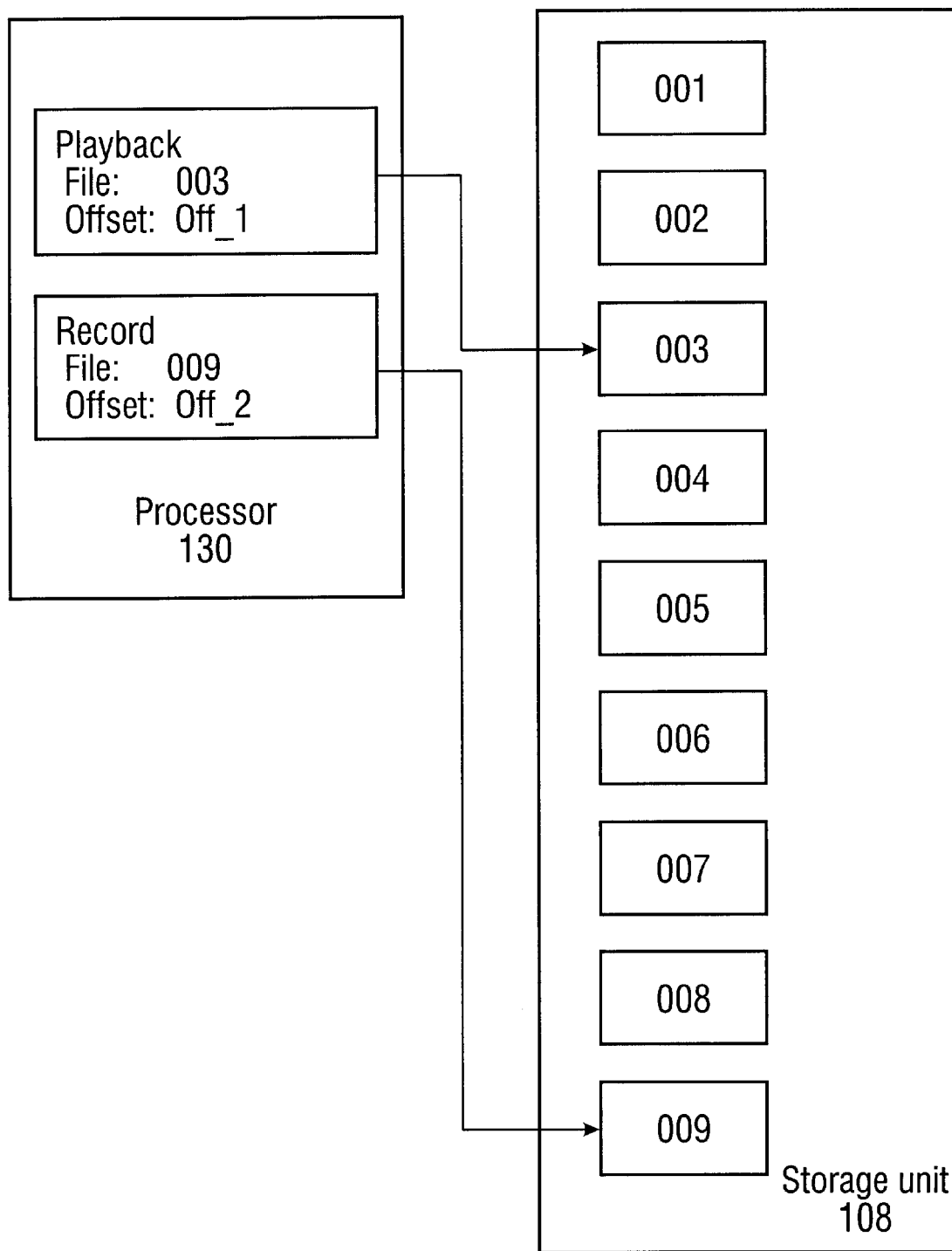


FIG. 4

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