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Linzer et al.

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(45) **Date of Patent: May 8, 2001**

(54) **MULTIPLE RESOLUTION VIDEO COMPRESSION**

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(73) Assignee: **C-Cube Semiconductor II, Inc.**, Milpitas, CA (US)

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(21) Appl. No.: **09/421,178**

(22) Filed: **Oct. 19, 1999**

Related U.S. Application Data

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(51) **Int. Cl.**[7] **H04N 7/12**
(52) **U.S. Cl.** **375/240.11**; 375/240.1
(58) **Field of Search** 348/397–399, 348/385, 387–389, 437–438, 426, 441, 445–446, 448, 458–459, 408, 437.1, 438.1; 382/240; 386/111; 375/240.1, 240.11, 240.19, 240.25, 240

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(57) **ABSTRACT**

An apparatus and method for compressing multiple resolution versions of a video signal are disclosed. A first resolution version of a video signal is applied to an input of a first video compressor and to an input of a video scaler. The first video compressor encodes the first resolution version of the video signal to generate a first compressed video bit stream. The video scaler generates a reduced resolution version of the video signal from the first resolution version. The reduced resolution version is supplied to a second video compressor and to the first video compressor. The first video compressor utilizes the reduced resolution version of the video signal in performing a hierarchical motion estimation (ME) search as part of the encoding process for the first resolution version. The second video compressor encodes the reduced resolution version to generate a second compressed bit stream. The second video compressor receives motion vectors or other results of the hierarchical ME search performed in the first video compressor, and uses these results to facilitate the encoding of the reduced resolution version. The apparatus and method may be used in a non-linear video editor, a video server or other video processing system. The video scaler and first and second video compressors may share memory, a transform unit and other processing hardware such that system cost and complexity are reduced.

24 Claims, 3 Drawing Sheets

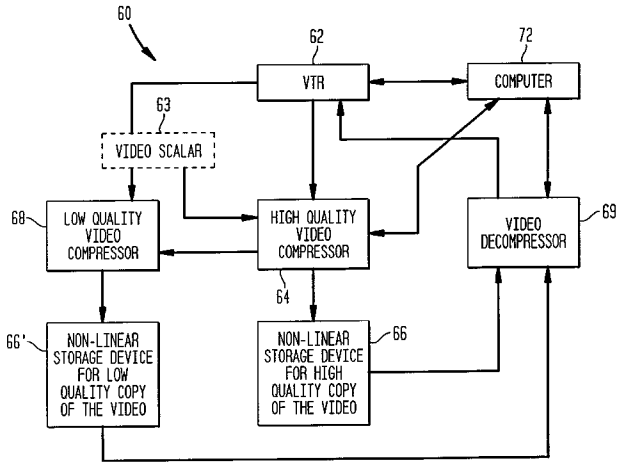

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FIG. 1
(PRIOR ART)

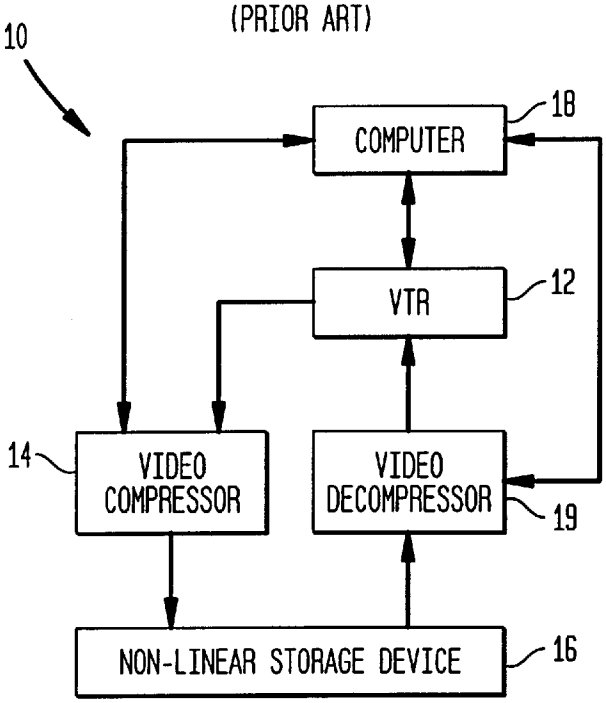

FIG. 2
(PRIOR ART)

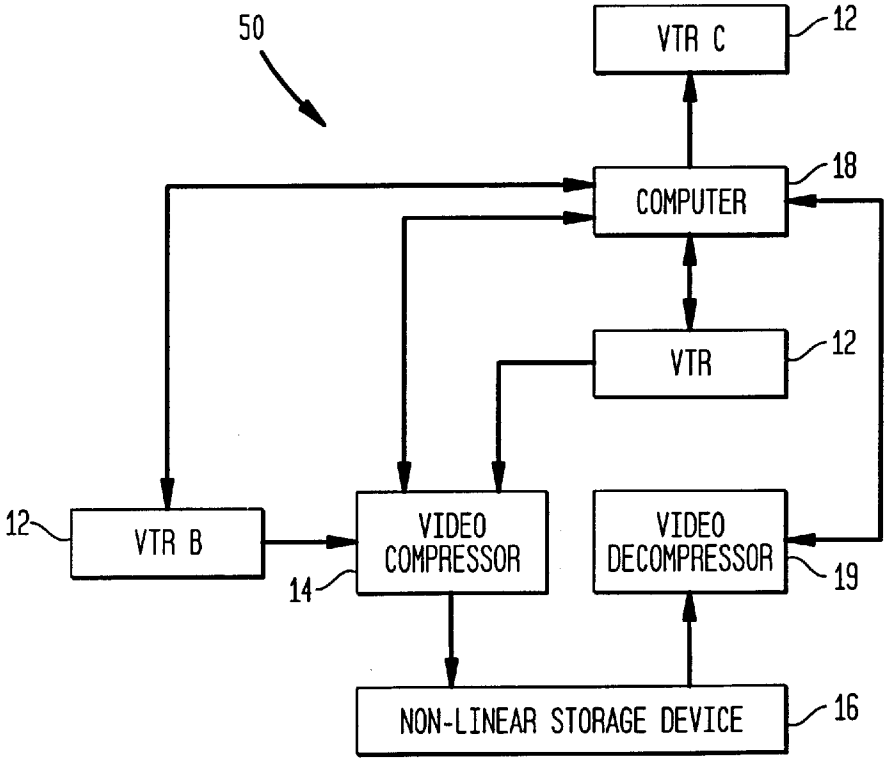

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FIG. 3
(PRIOR ART)

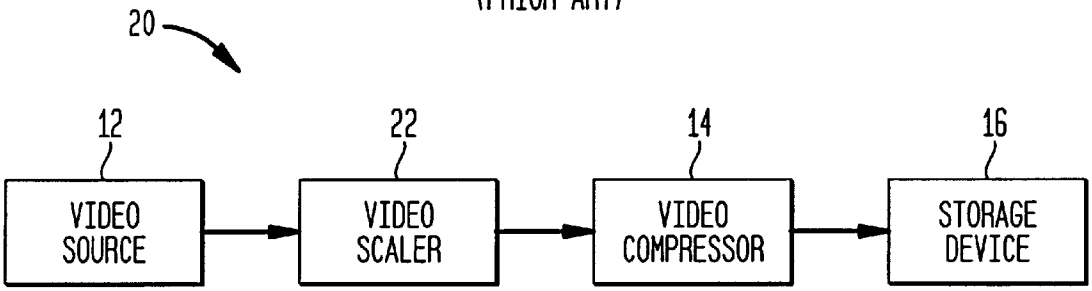

FIG. 4

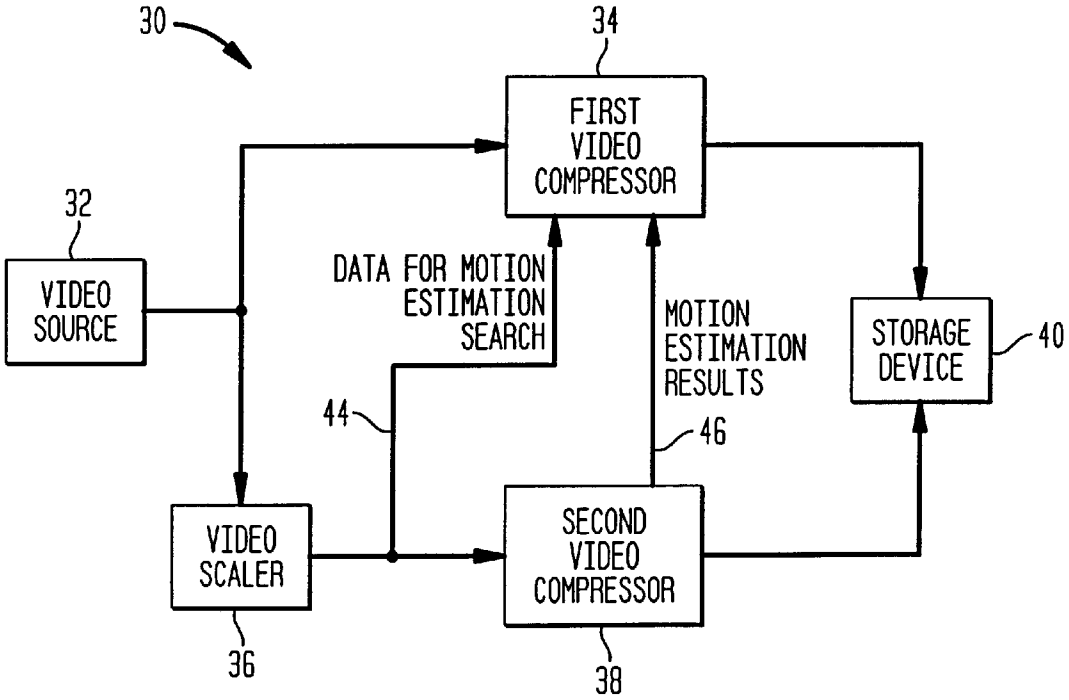

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FIG. 5

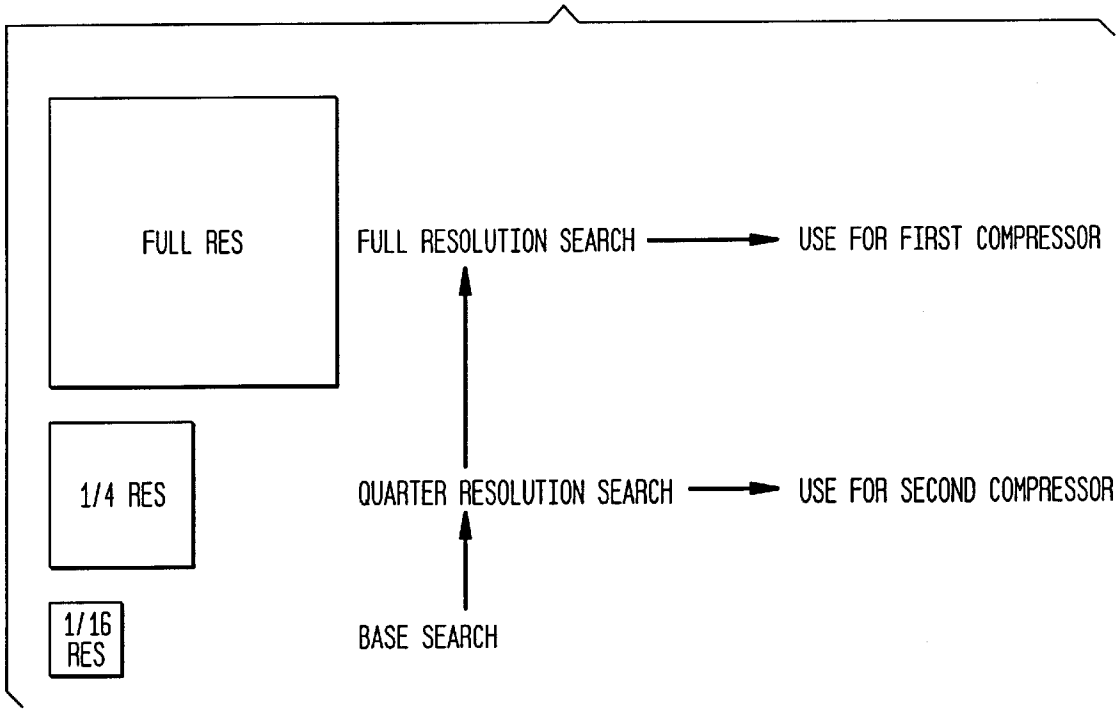
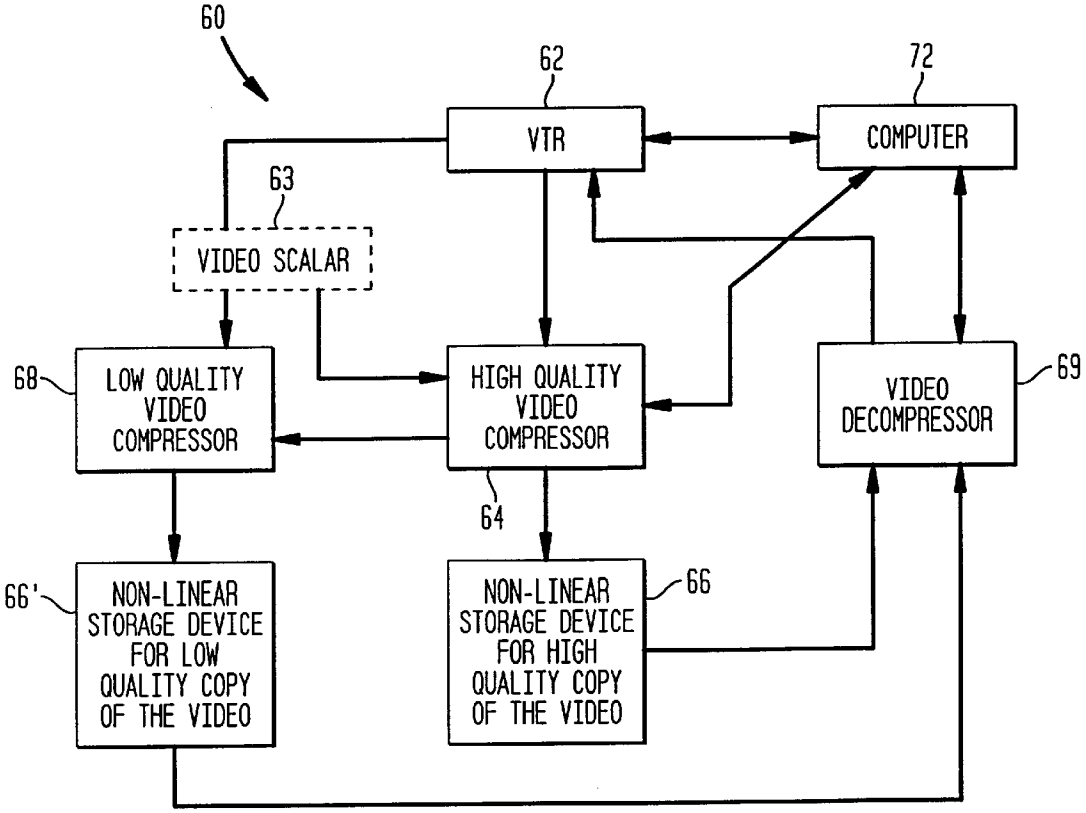


FIG. 6



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