United States Patent [19]

Normile et al.

[11] Patent Number: 5,461,679

[45] Date of Patent: Oct. 24, 1995

[54] **METHOD AND APPARATUS FOR ENCODING/DECODING IMAGE DATA**

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[73] Assignee: **Apple Computer, Inc.**, Cupertino, Calif.

[21] Appl. No.: **62,067**

[22] Filed: **May 14, 1993**

Related U.S. Application Data

[63] Continuation of Ser. No. 705,284, May 24, 1991, Pat. No. 5,212,742.

[51] **Int. Cl.^{6}** **G06K 9/36**

[52] **U.S. Cl.** **382/304**; 382/305; 395/650; 395/163; 395/474

[58] **Field of Search** 382/56, 27, 41, 382/49; 340/752; 364/133; 395/114, 115, 425

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[57] **ABSTRACT**

An apparatus and method for processing video data for compression/decompression in real-time. The apparatus comprises a plurality of compute modules, in a preferred embodiment, for a total of four compute modules coupled in parallel. Each of the compute modules has a processor, dual port memory, scratch-pad memory, and an arbitration mechanism. A first bus couples the compute modules and a host processor. Lastly, the device comprises a shared memory which is coupled to the host processor and to the compute modules with a second bus. The method handles assigning portions of the image for each of the processors to operate upon.
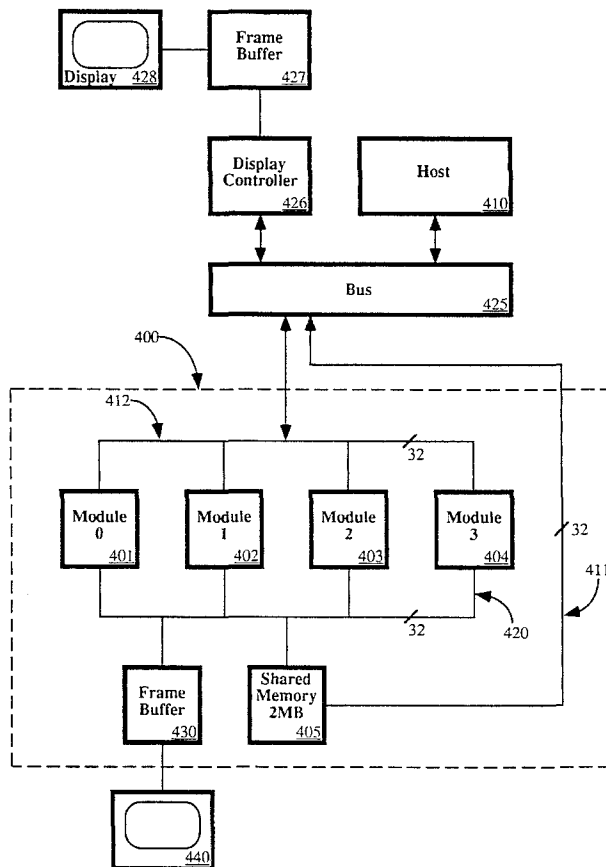
15 Claims, 11 Drawing Sheets

100

Rate Control

| DCT 101 | Quantizer 102 | Variable Length Coding 103 | Multi-plexing 104 |

Input Image

110

$+$

Inverse Quantizer 108

Intra/ Inter 106

Rate Control 111

Inverse DCT 109

$+$

Buffer 112

Motion Estimation 105

Frame Memory 107

Side Information

120

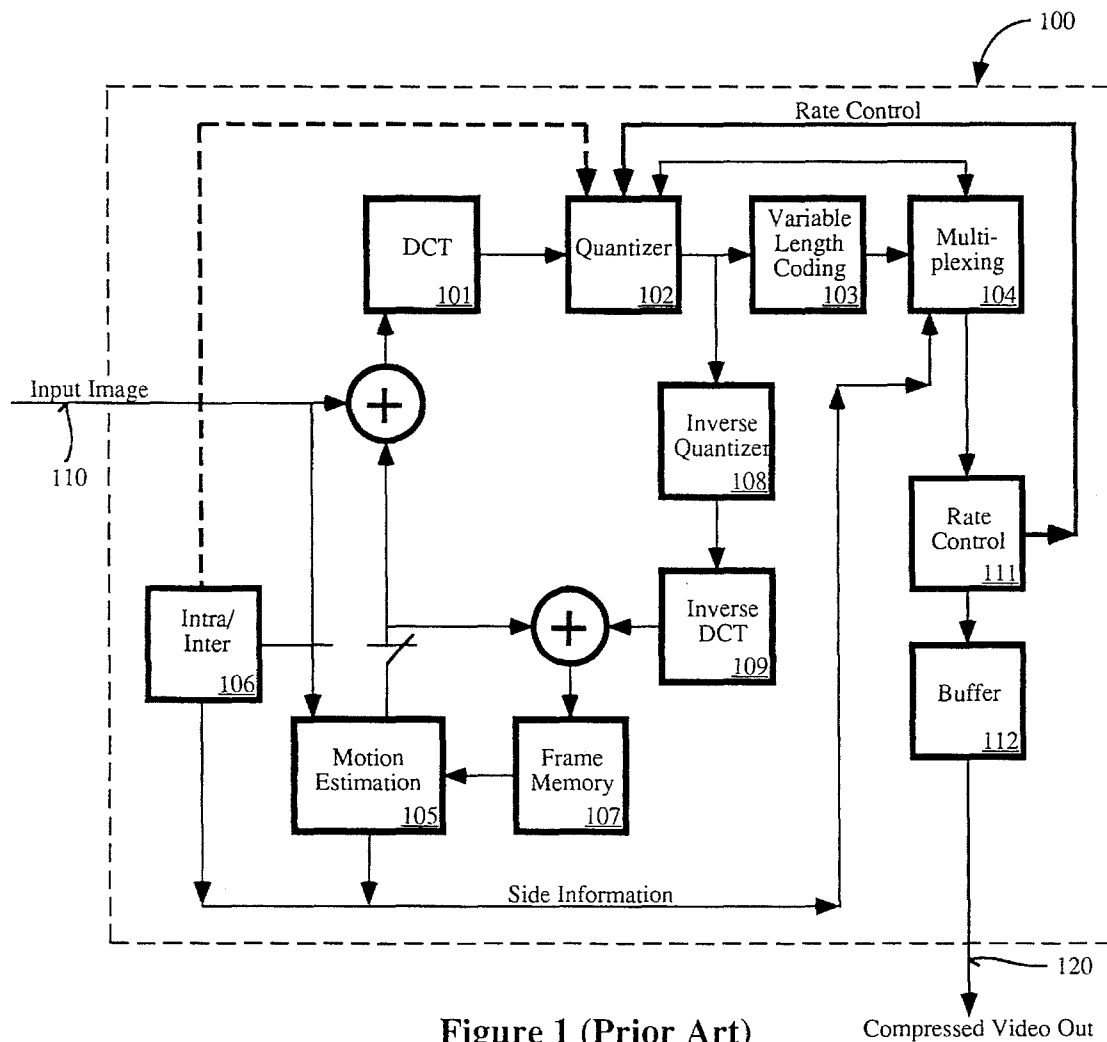**Figure 1 (Prior Art)**
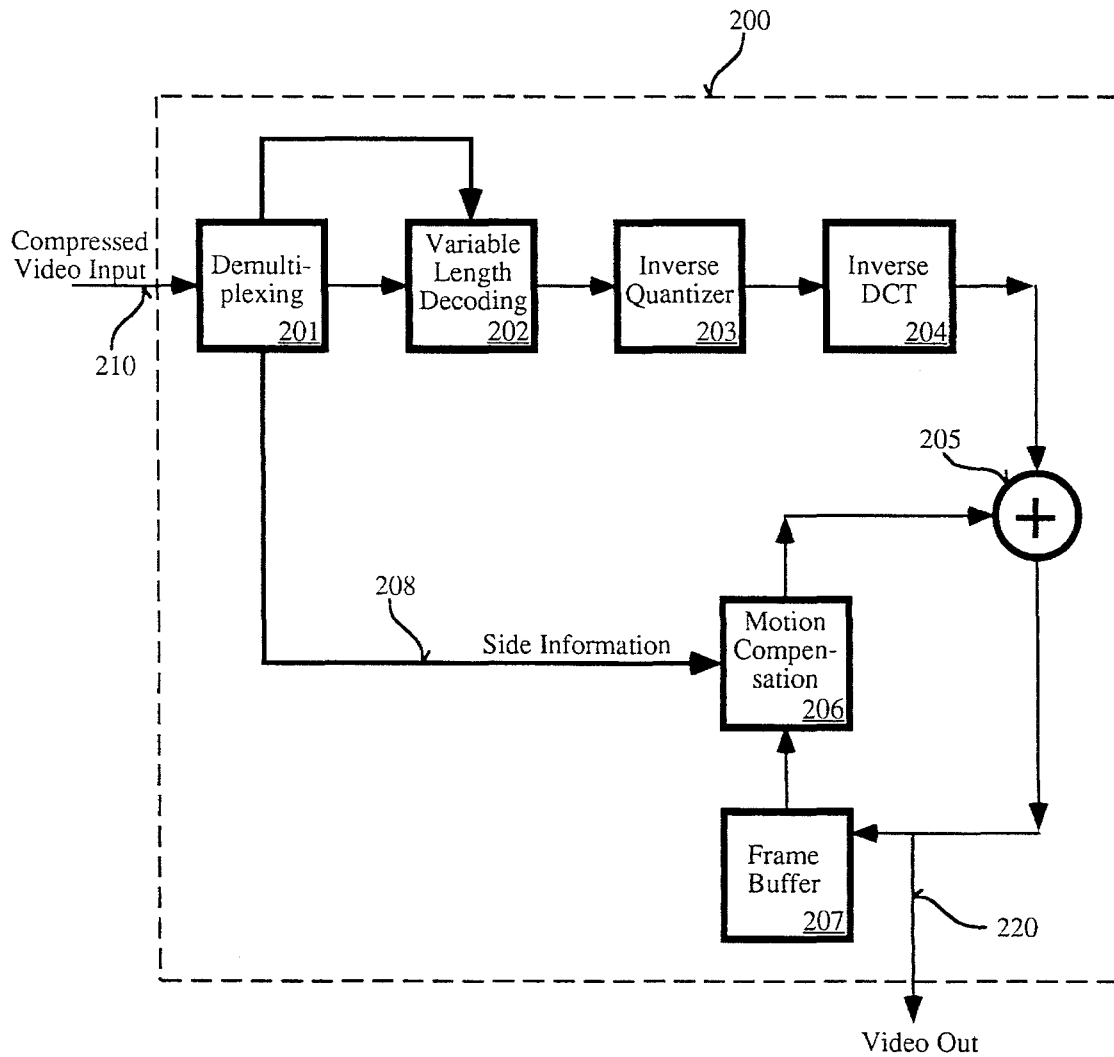
Compressed Video Out

Figure 2 (Prior Art)

Figure 3 (Prior Art)

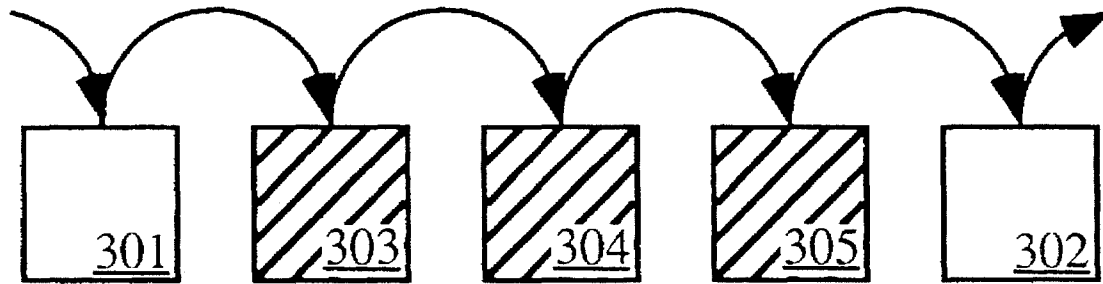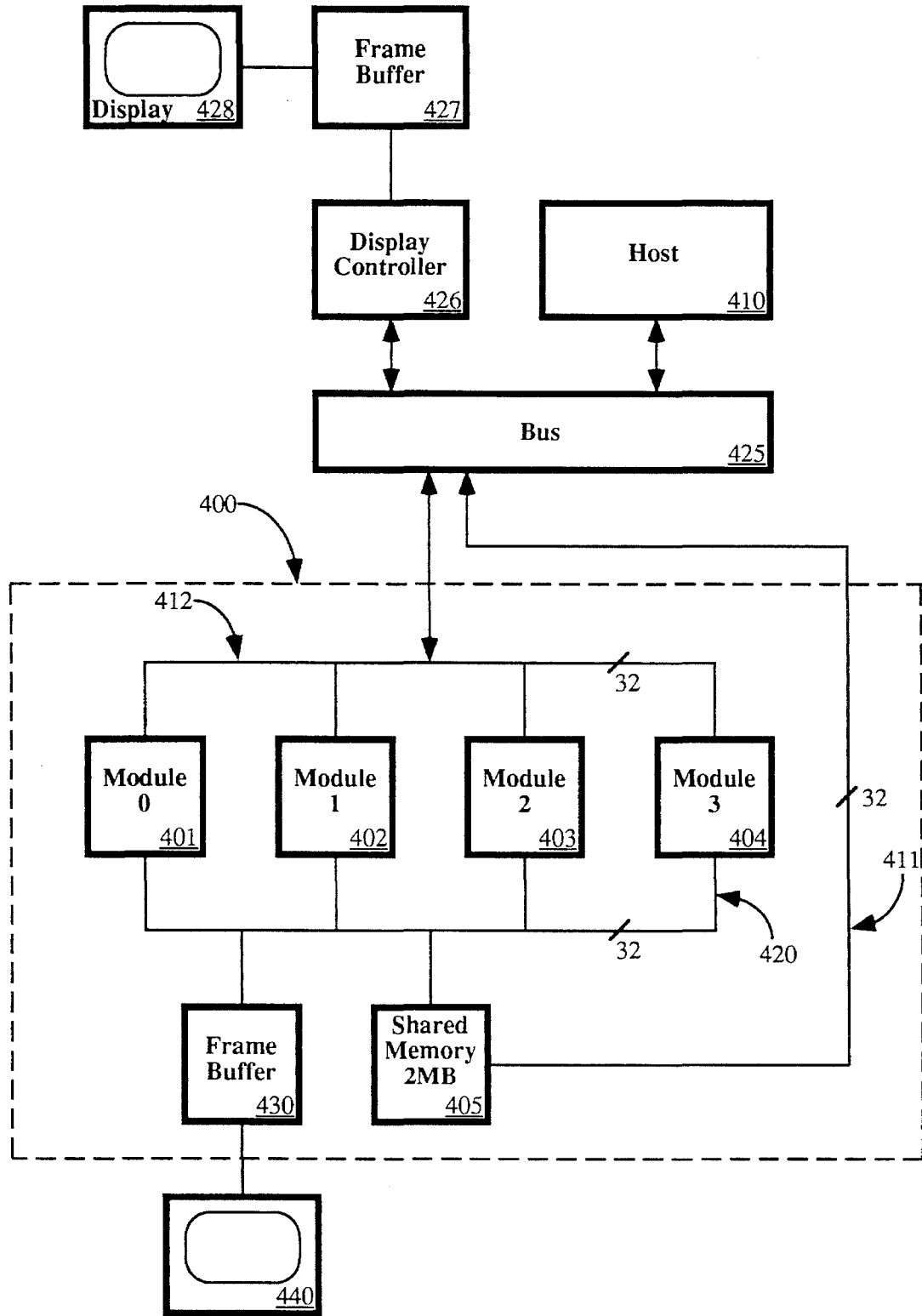**Figure 4**

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