



US006259819B1

(12) **United States Patent**
Andrew et al.

(10) **Patent No.:** **US 6,259,819 B1**
(45) **Date of Patent:** **Jul. 10, 2001**

(54) **EFFICIENT METHOD OF IMAGE
COMPRESSION COMPRISING A LOW
RESOLUTION IMAGE IN THE BIT STREAM**

5,982,938 * 11/1999 Dube 382/240

OTHER PUBLICATIONS

“Coding of Still Pictures”, Boliek et al., ISO/IEC JTC 1/SC 29/WG 1, Jun. 30, 1995.

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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.

(57) **ABSTRACT**

A method of providing a thumbnail-size colour digital image in a bit stream of a larger size colour digital image is disclosed. The bit stream of the larger digital image is typically in a compressed format, and includes a thumbnail size image in a substantially uncompressed format. The method includes converting input colour values of the larger colour image from a first colour format to corresponding values in a Luminance, Chrominance-blue, Chrominance-red (Y,Cb,Cr) colour format, A transform is then applied to said corresponding values to decompose the larger digital image into a DC subband and one or more higher frequency subbands. Typically the transform is a discrete wavelet transform. The DC subband is then output to the bit stream in an uncompressed format. Then at least one of the one or more higher frequency subbands is encoded into the bit stream in a substantially compressed format. The DC subband thus represents a thumbnail-size colour digital image in the bit stream.

(21) **Appl. No.:** **09/055,316**

(22) **Filed:** **Apr. 6, 1998**

(30) **Foreign Application Priority Data**

Apr. 4, 1997 (AU) PO6008

(51) **Int. Cl.⁷** **G06K 9/36**; G06K 9/46

(52) **U.S. Cl.** **382/248**; 382/240; 382/247;
382/166

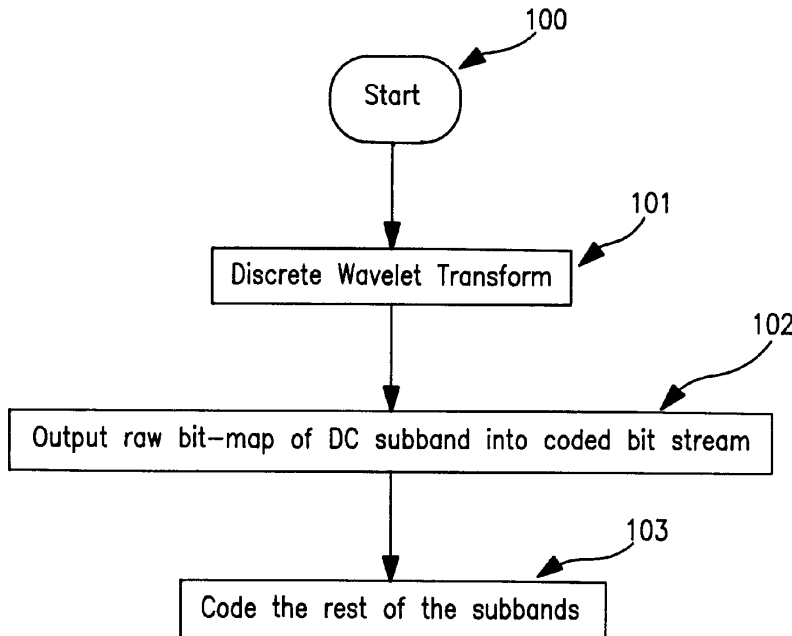
(58) **Field of Search** 382/162, 166,
382/167, 240, 247, 250, 251, 299, 248

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53 Claims, 14 Drawing Sheets



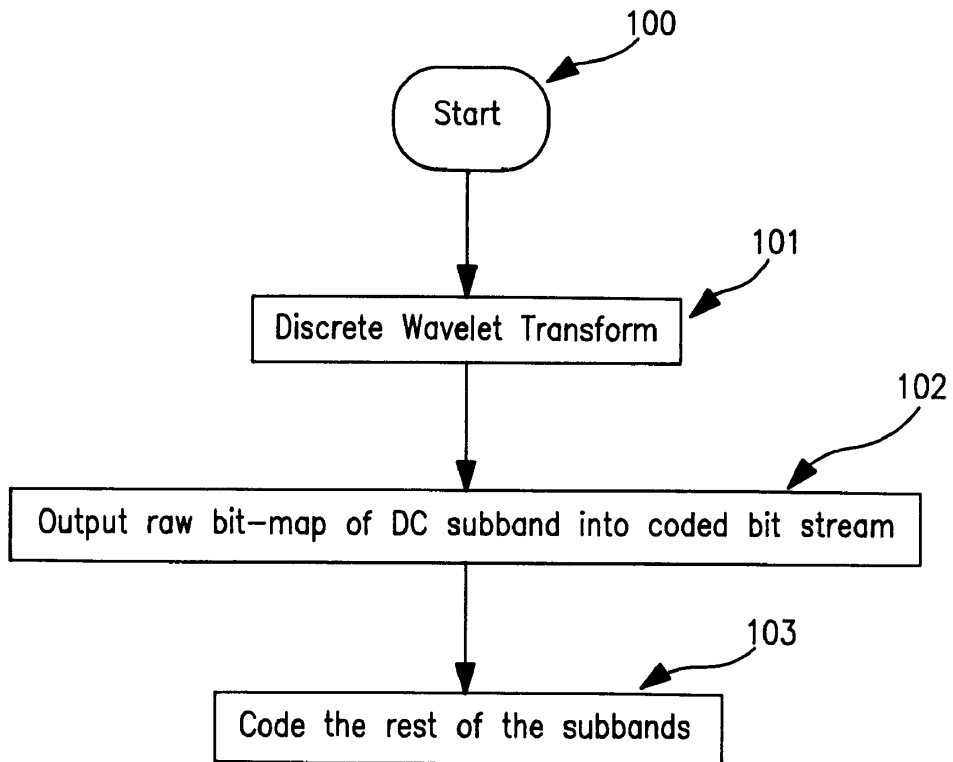


FIG. 1

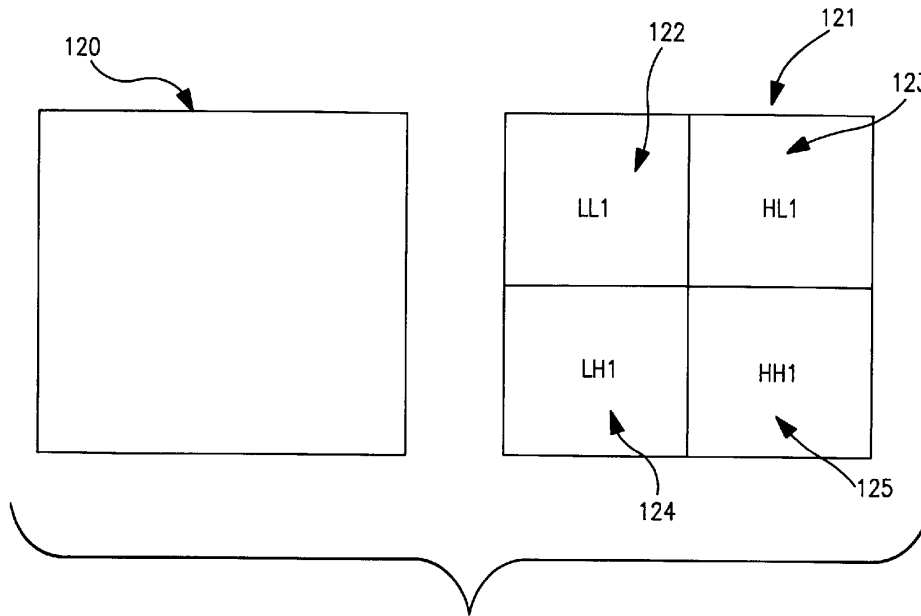


FIG. 2

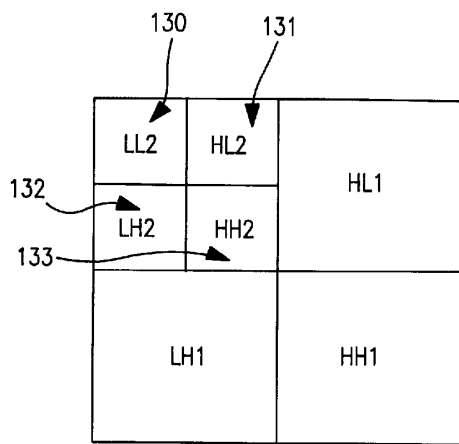


FIG. 3

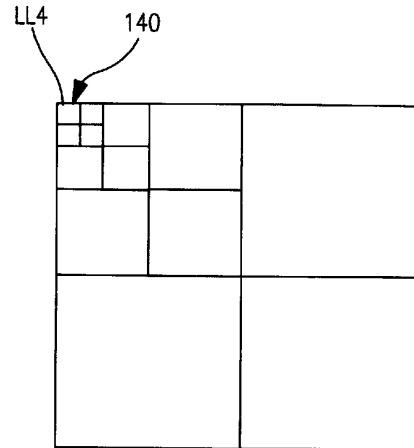


FIG. 4

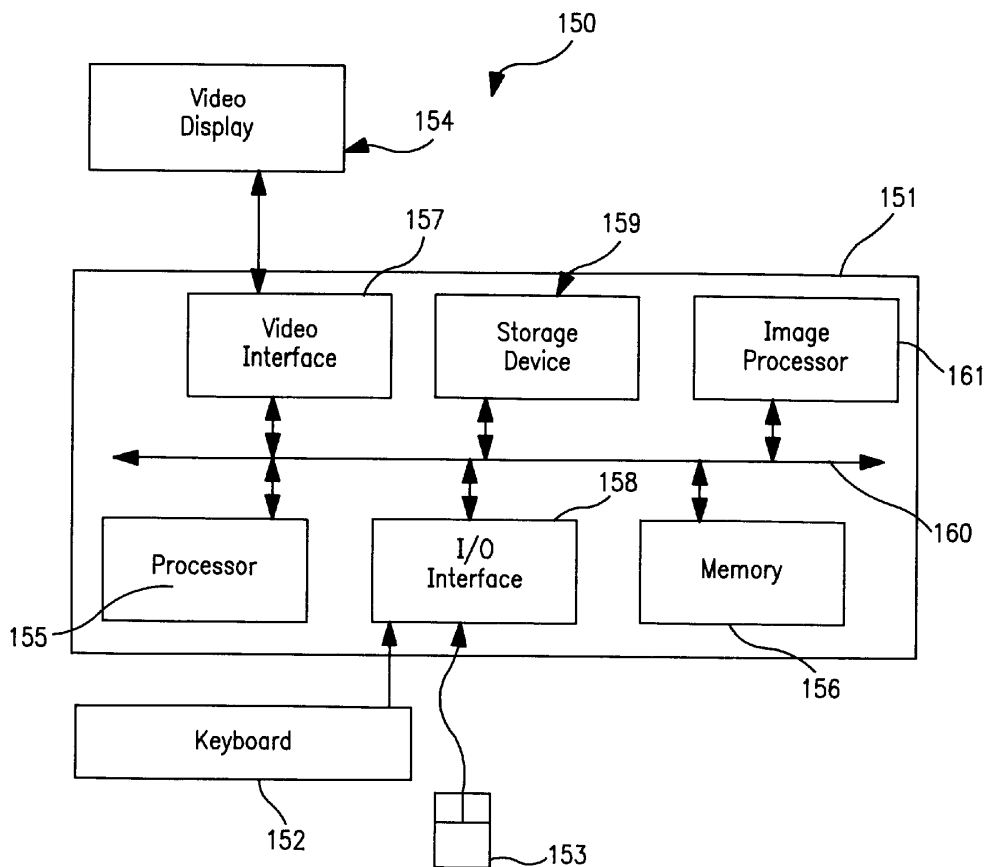


FIG. 5

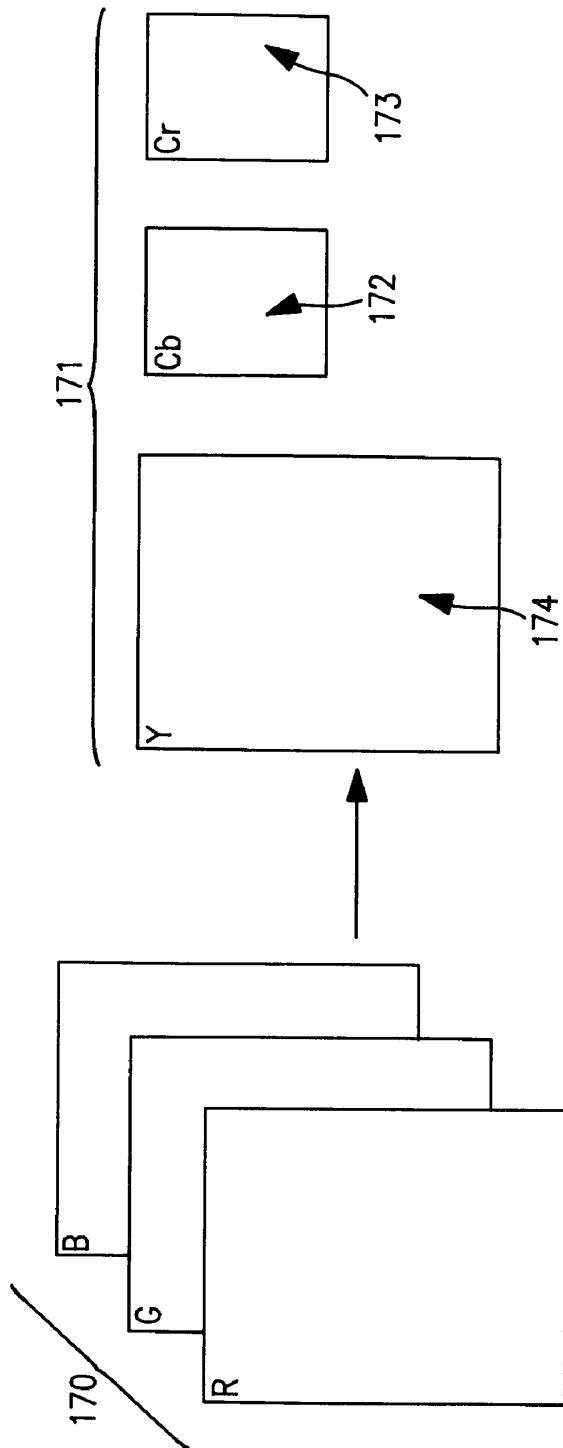


FIG. 6

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