US005706216A

United States Patent [19]

Reisch

[54] **SYSTEM FOR DATA COMPRESSION OF AN IMAGE USING A JPEG COMPRESSION CIRCUIT MODIFIED FOR FILTERING IN THE FREQUENCY DOMAIN**

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[56] **References Cited**

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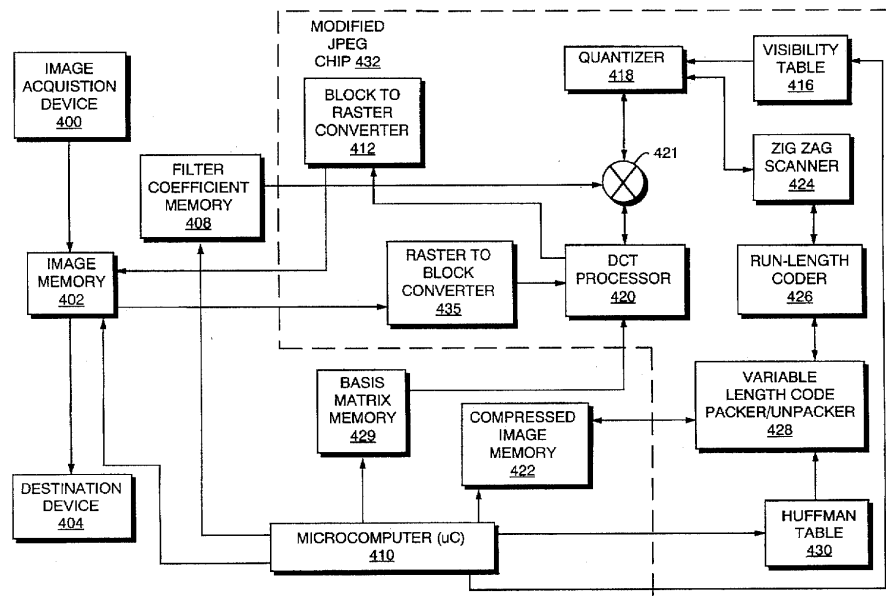|			
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Attorney, Agent, or Firm—Robert A. Sabourin

[57] **ABSTRACT**

A system for filtering an image during data compression using a standard JPEG compression/decompression chip typically requires a separate spatial filter external to the chip. The spatial filter is composed of numerous shift registers, flip-flops, multipliers and at least one adder. In contrast, an image filtering system which filters in the frequency domain using the inventive JPEG compression chip modified for filtering in the frequency domain does not require the separate spatial filter and its many components. The modified JPEG chip includes a raster to block converter which converts an image signal into 8×8 blocks, a DCT processor which converts the 8×8 blocks into DCT coefficients, a multiplier which generates filtered DCT coefficients by multiplying predetermined filtering coefficients times the DCT coefficients, a quantizer which generates quantized blocks to a predetermined level stored in a visibility table by quantizing the filtered coefficients, a zigzag scanner which generates a vector having the same number of elements as the quantized blocks, a run-length coder for determining the appropriate run-length according to entropy encoding received from a preloaded Huffman table, and a variable length code packer/unpacker for compressing the entropy encoded vector. A block to raster converter is included to reformat decompressed data.
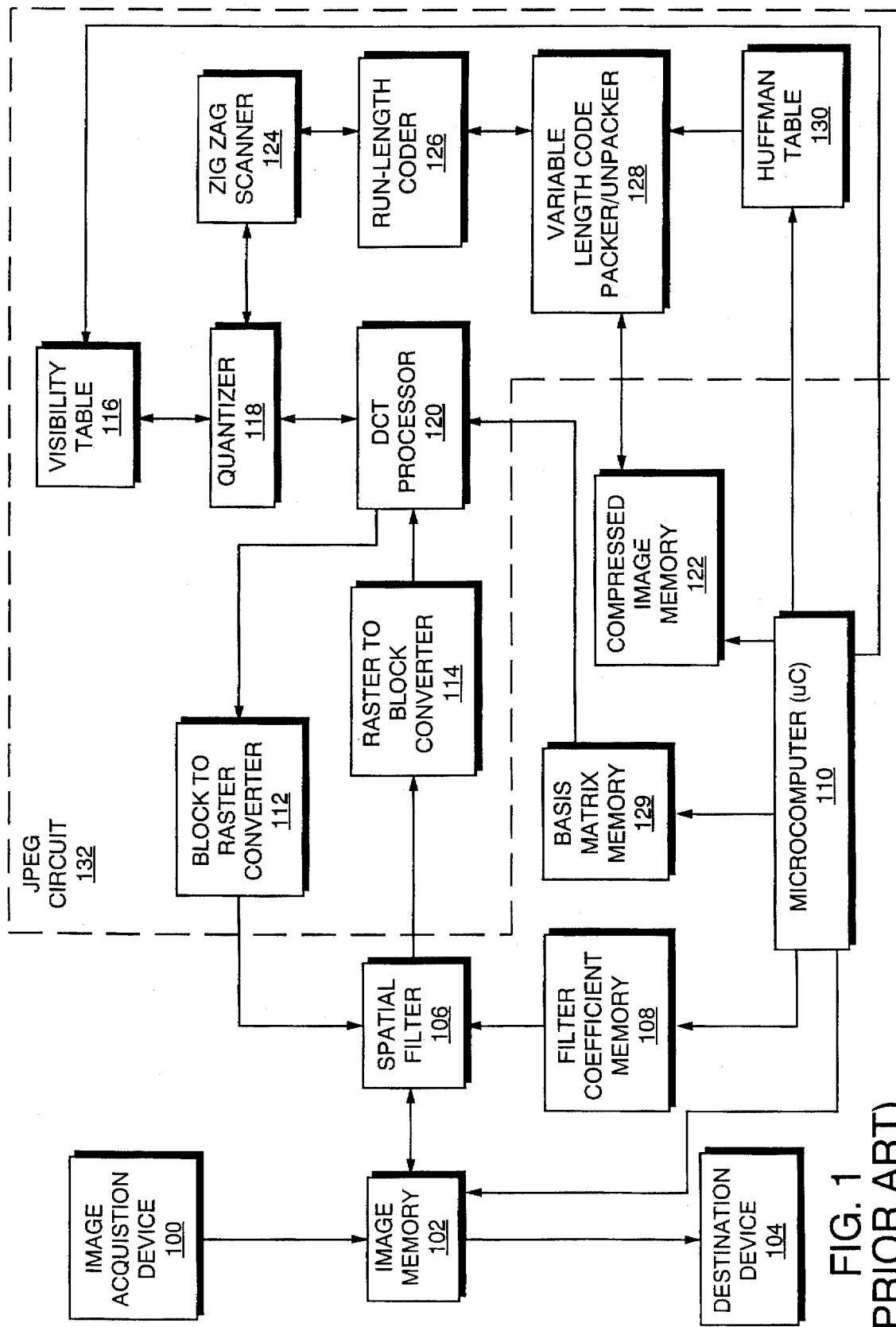
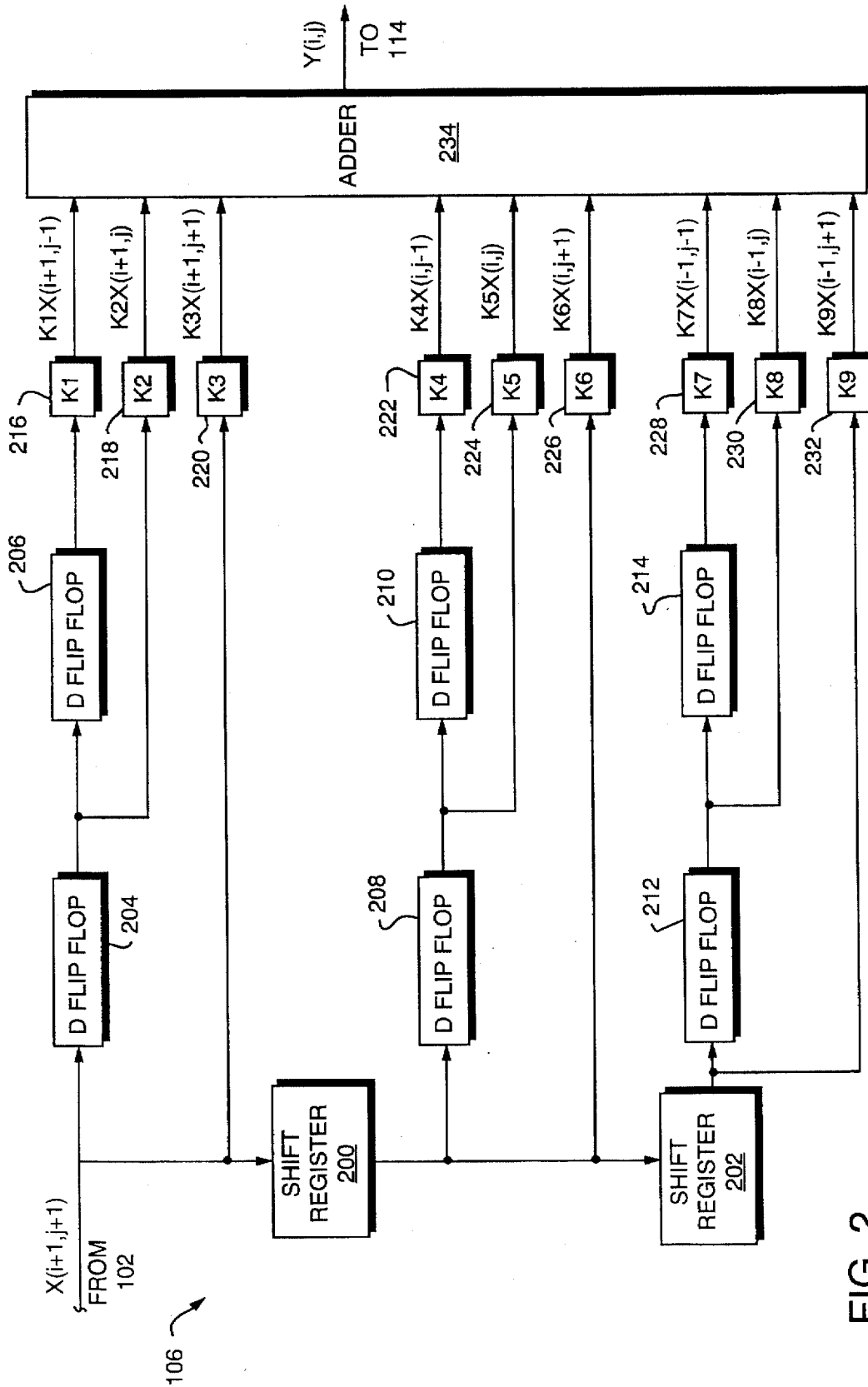**7 Claims, 4 Drawing Sheets**

FIG. 1
(PRIOR ART)

FIG. 2
(PRIOR ART)

$$\begin{vmatrix} K7 & K8 & K9 \\ K4 & K5 & K6 \\ K1 & K2 & K3 \end{vmatrix}$$

**FIG. 3B
(PRIOR ART)**

$$\begin{vmatrix} X(1,1) & X(1,2) & X(1,3) & \cdots & X(1,n) \\ X(2,1) & X(2,2) & X(2,3) & \cdots & X(2,n) \\ X(3,1) & X(3,2) & X(3,3) & \cdots & X(3,n) \\ & \cdots & & & \\ X(m,1) & X(m,2) & X(m,3) & \cdots & X(m,n) \end{vmatrix}$$

**FIG. 3A
(PRIOR ART)**

FIG. 4

DOCKET ALARM
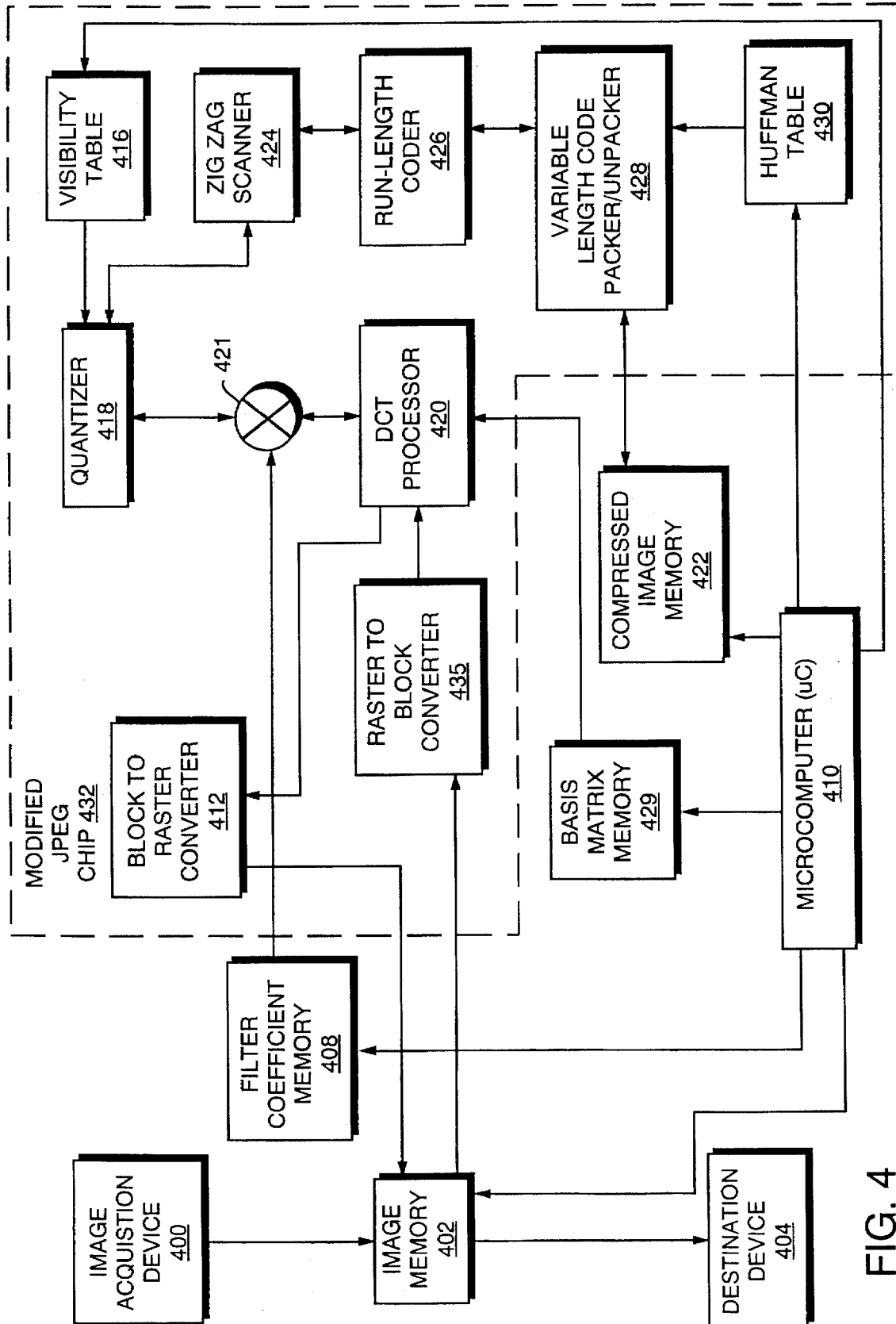
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