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(12) **United States Patent**
Tao

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(45) **Date of Patent: Oct. 26, 2004**

(54) **DEMOSAICING FOR DIGITAL IMAGING DEVICE USING PERCEPTUALLY UNIFORM COLOR SPACE**

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(73) Assignees: **Sony Corporation**, Tokyo (JP); **Sony Electronics Inc**, Park Ridge, NJ (US)

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

(21) Appl. No.: **09/412,187**

(22) Filed: **Oct. 5, 1999**

(51) **Int. Cl.**[7] **H04N 5/335**; H04N 1/46; G06K 9/36; G06K 9/32; G03F 3/08

(52) **U.S. Cl.** **348/273**; 382/276; 382/300; 358/515; 358/518; 358/525

(58) **Field of Search** 348/273, 277, 348/278, 280, 222.1; 382/275, 276, 277, 300; 358/515, 518, 525

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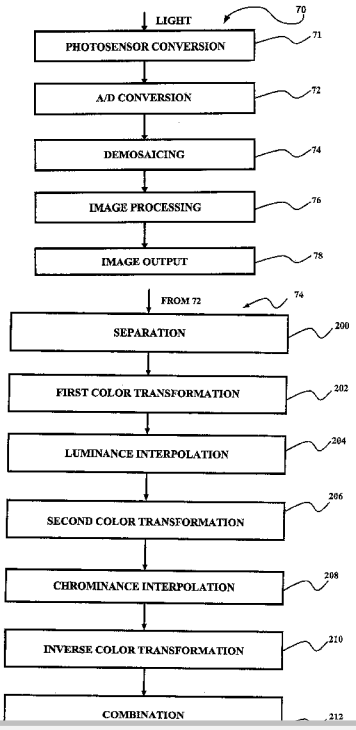
(57) **ABSTRACT**

A digital camera is provided having a lens for focusing light from an image through a RGB mosaiced filter on to a solid state photosensor array containing a matrix of CCDs. The CCDs provide a single-channel mosaiced image output. A demosaicing process includes a first color transformation after separation for determining luminance and a luminance interpolation for interpolation of missing luminance components. The demosaicing process further includes a second color transformation for obtaining chrominance components. A chrominance interpolation for interpolation of missing chrominance components and an inverse color transformation transforms the components into the RGB space for combination into an image output.

24 Claims, 6 Drawing Sheets



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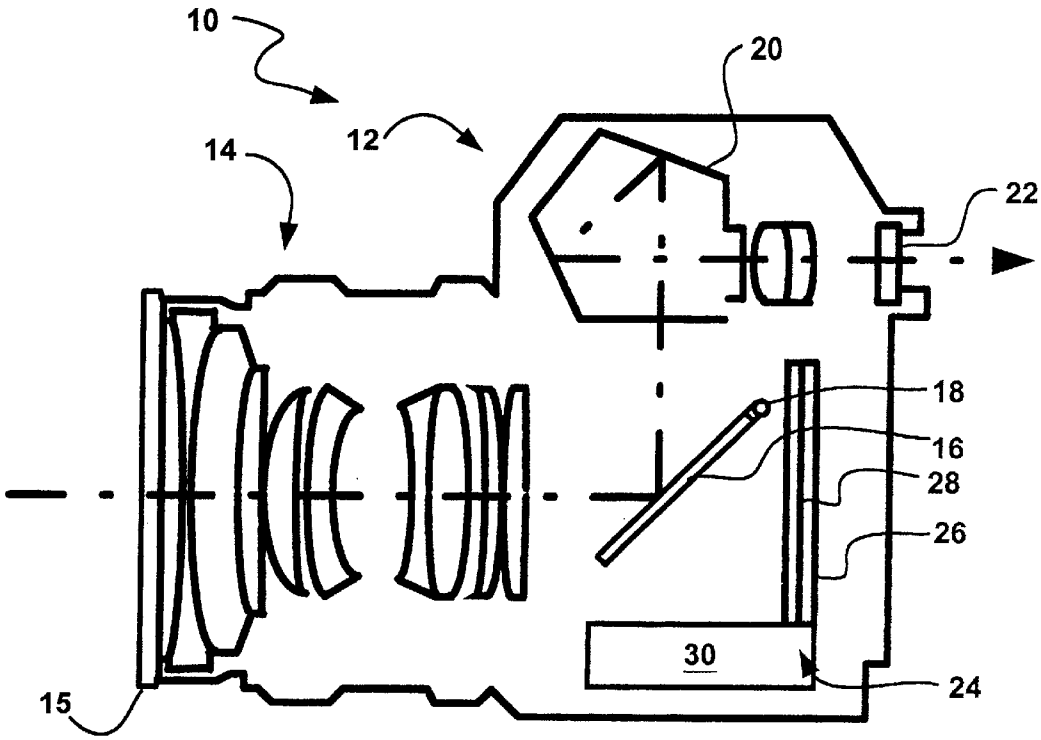

FIG. 1

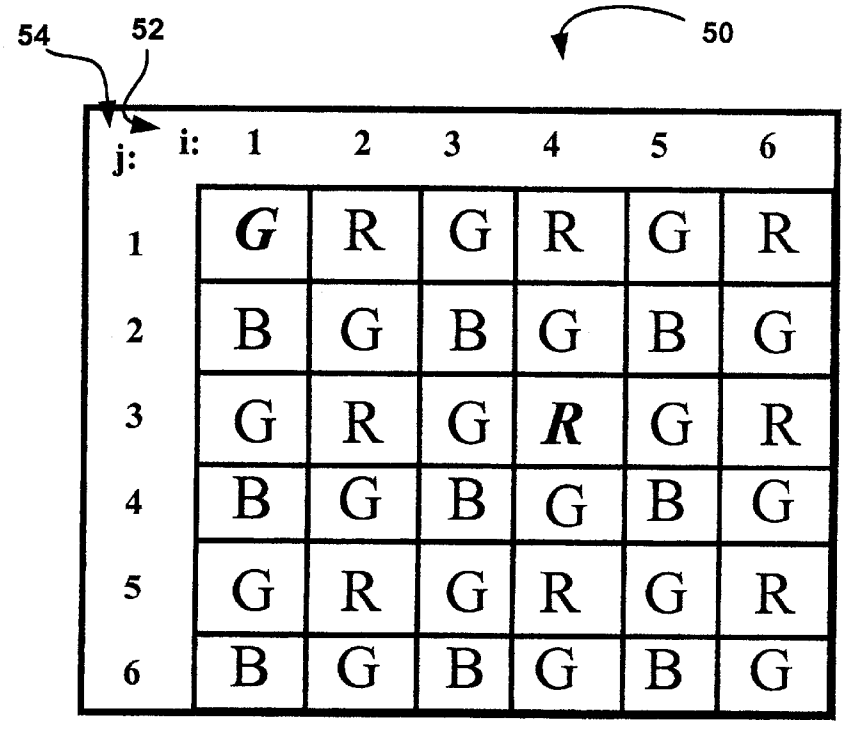

FIG. 2 (PRIOR ART)

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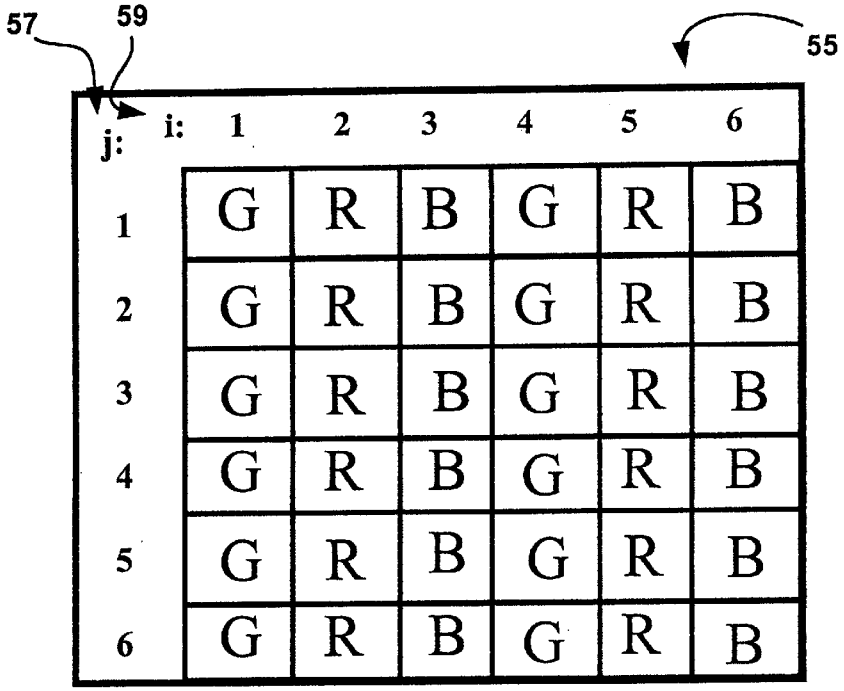
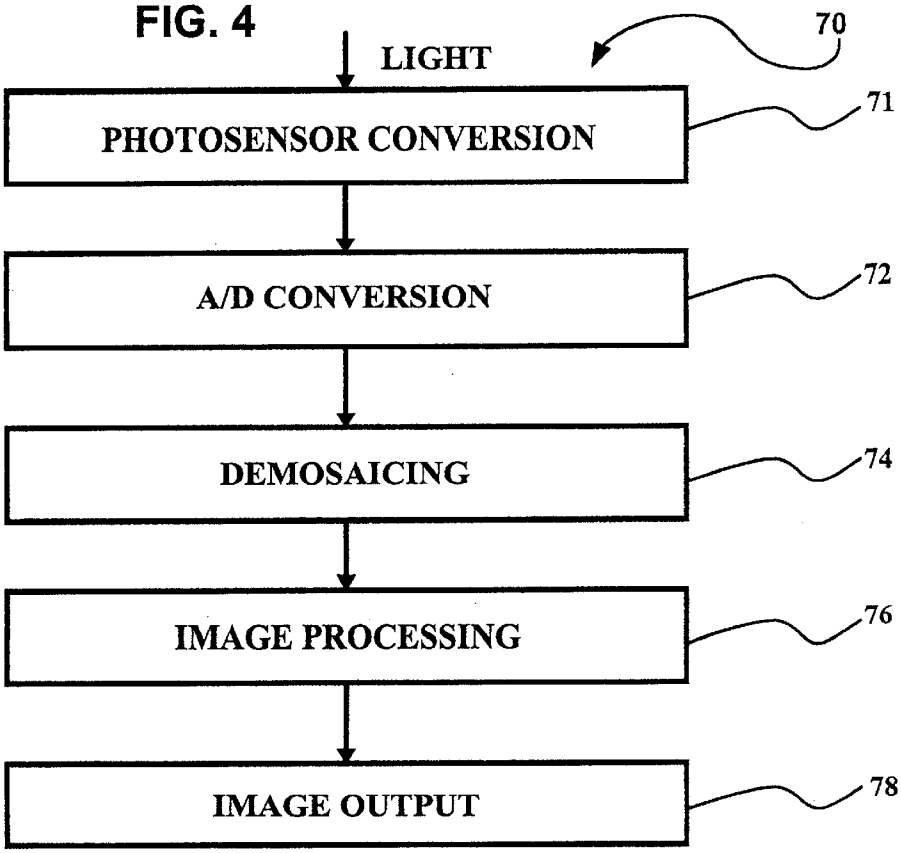


FIG. 3 (PRIOR ART)

FIG. 4



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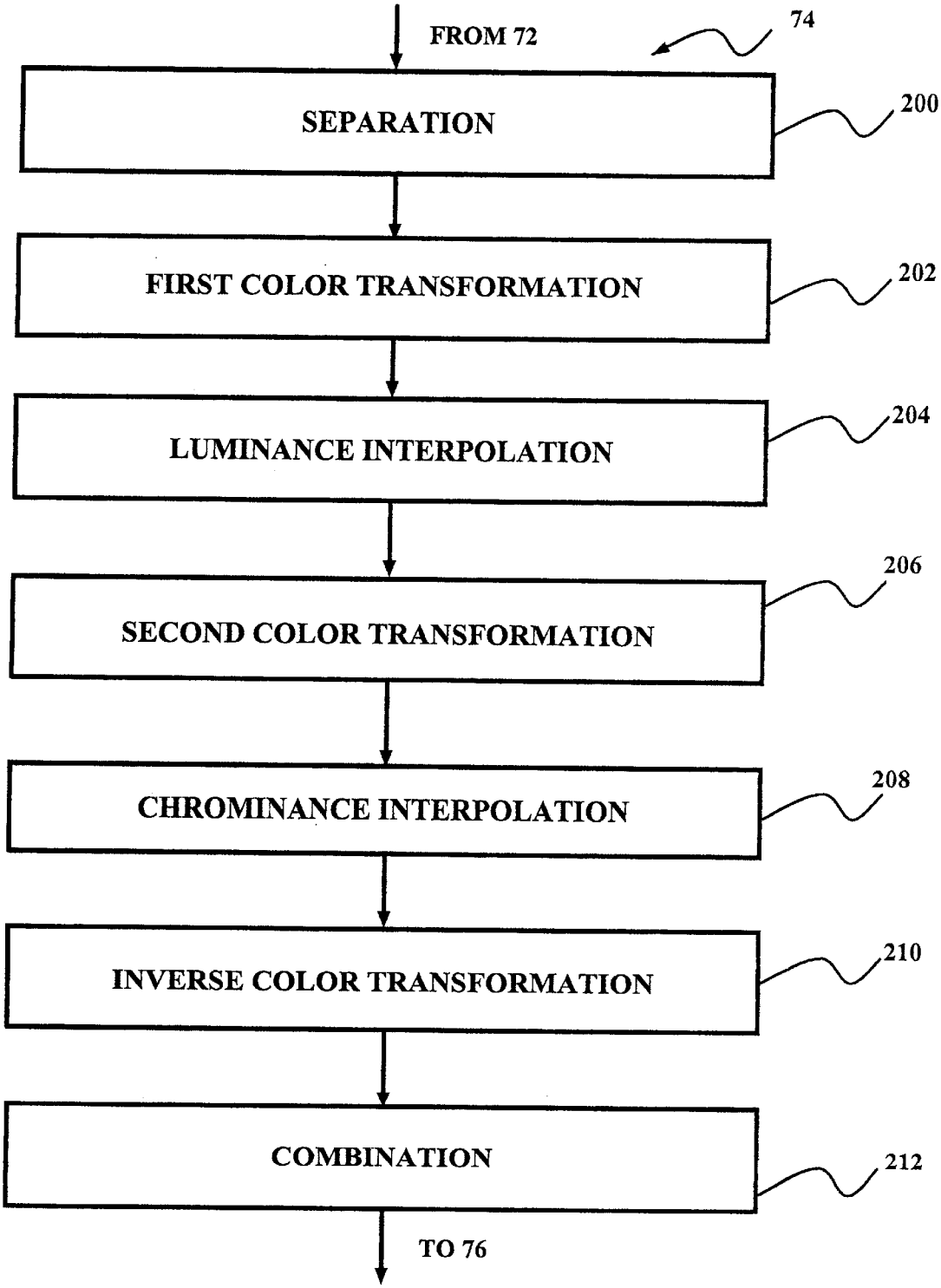

FIG. 5

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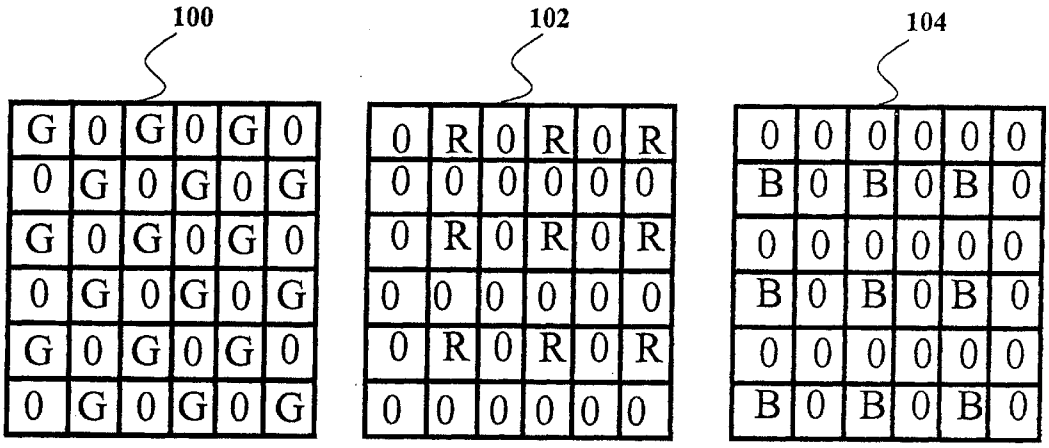

FIG. 6

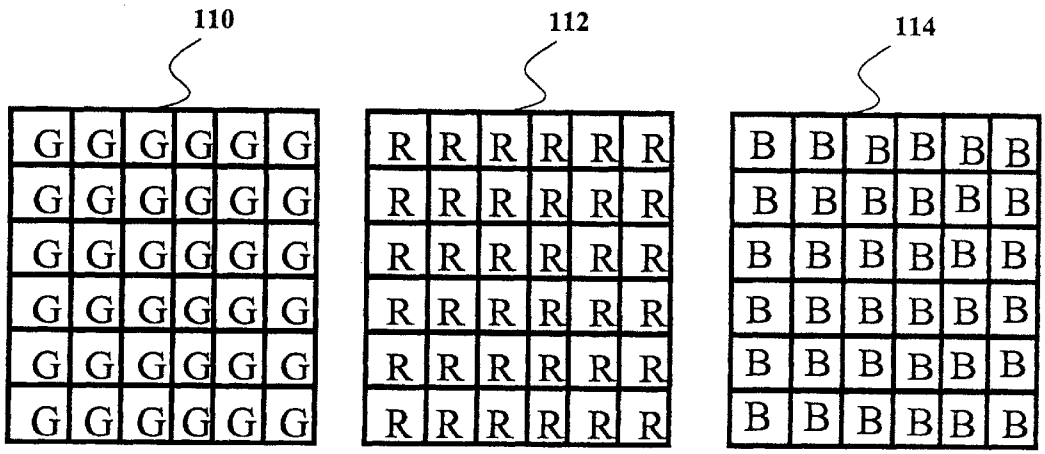

FIG. 7

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