United States Patent [19]

Ishizuka

[54] **VIDEO SIGNAL PROCESSING APPARATUS FOR CORRECTING FOR CAMERA VIBRATIONS USING CCD IMAGER WITH A NUMBER OF LINES GREATER THAN THE NTSC STANDARD**

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[73] Assignee: **Sony Corporation**, Tokyo, Japan

[21] Appl. No.: **395,900**

[22] Filed: **Feb. 28, 1995**

Related U.S. Application Data

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[30] **Foreign Application Priority Data**

Jun. 9, 1992 [JP] Japan 4-174896

[51] **Int. Cl.^{6}** **H04N 5/228**
[52] **U.S. Cl.** **348/208**; 348/294; 348/316
[58] **Field of Search** 348/208, 207, 348/240, 294, 155, 699, 700, 303, 304, 311, 316; 359/554; 354/70; H04N 5/228

[56] **References Cited**

U.S. PATENT DOCUMENTS

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Assistant Examiner—Tuan Y. Ho
Attorney, Agent, or Firm—Jay H. Maioli

[57] **ABSTRACT**

A video signal processing apparatus for correcting vibration effects in a video camera that has a CCD image pickup device having a number of lines greater than the number of lines of the standard NTSC television system. The lines used to generate the image are shifted during the vertical blanking interval to correct for vibrations of the video camera, and the overflow charges which are caused by transferring the CCD image pickup device at a high speed during the blanking period are absorbed into a semiconductor drain element arranged in parallel with the horizontal transfer register of the CCD image pickup device. Defective pixels in the image pickup device are compensated by storing the addresses of defective pixels and interpolating at those positions, during vibration correction the addresses of the defective pixels are shifted to correspond to the amount of vibration correction. A read clock and a write clock for the line memory that is used to perform the vibration correction in the horizontal direction are set to line-locked clock signals of different frequencies, thereby preventing deterioration of the picture quality upon vibration correction. The window used to detect optical information for automatic camera control is also shifted in accordance with the shift amount used to perform vibration correction.
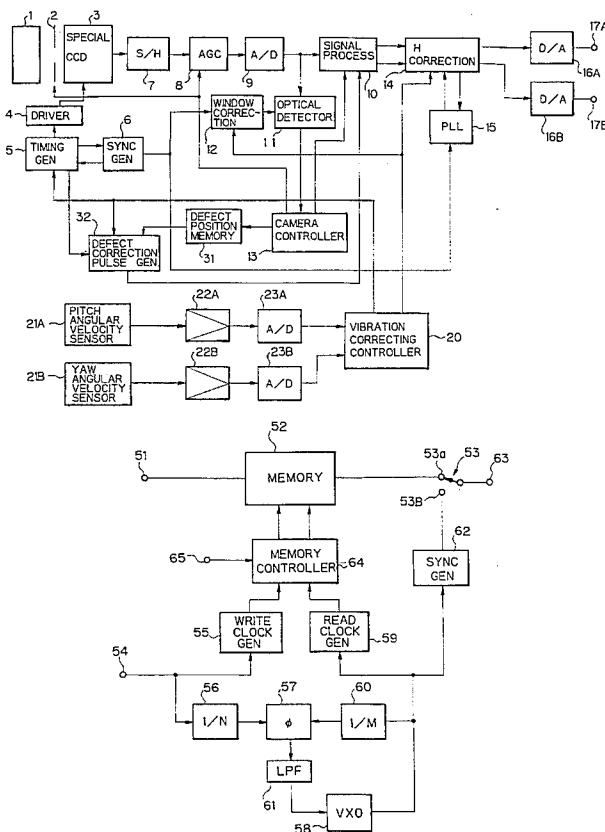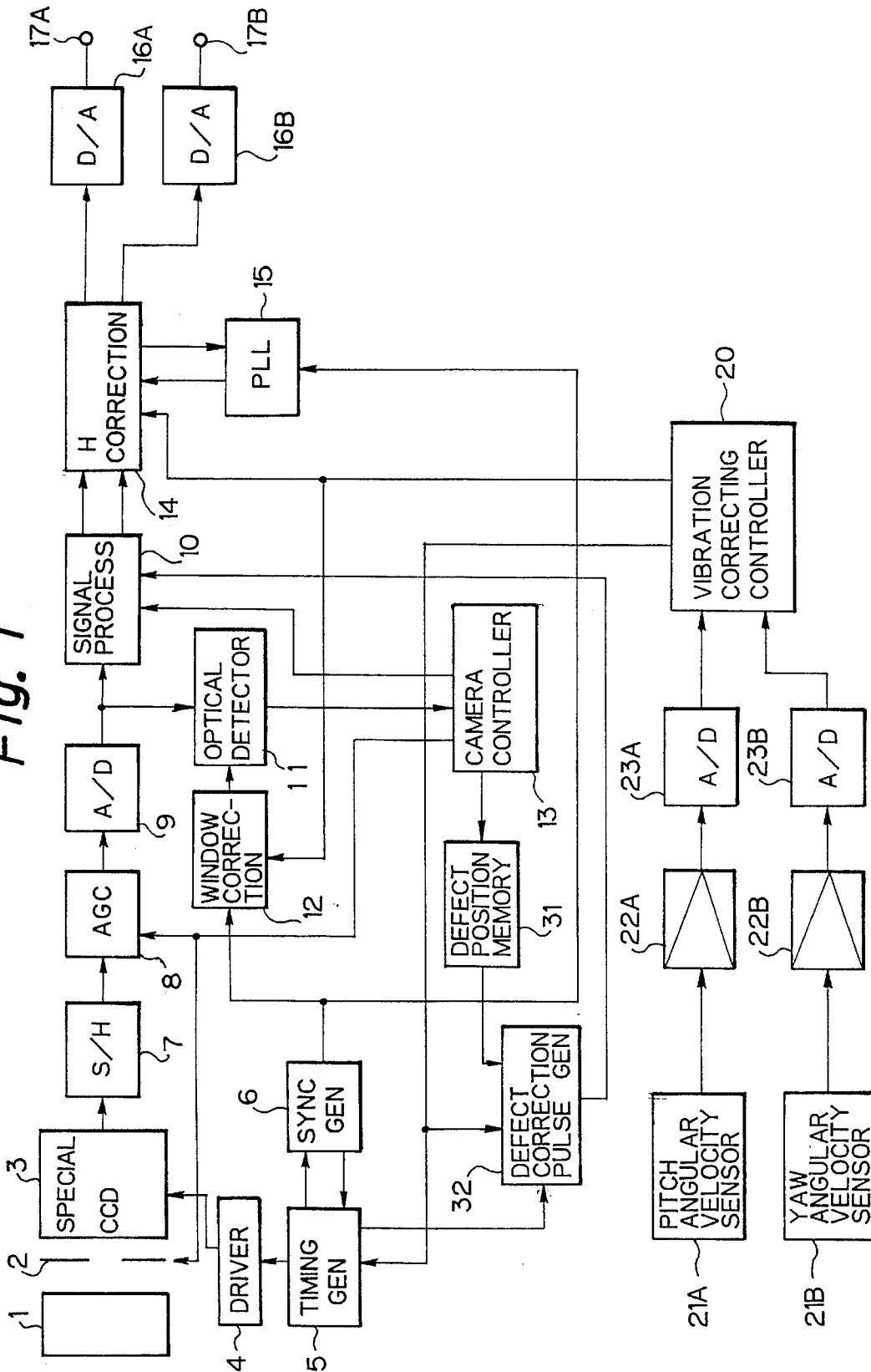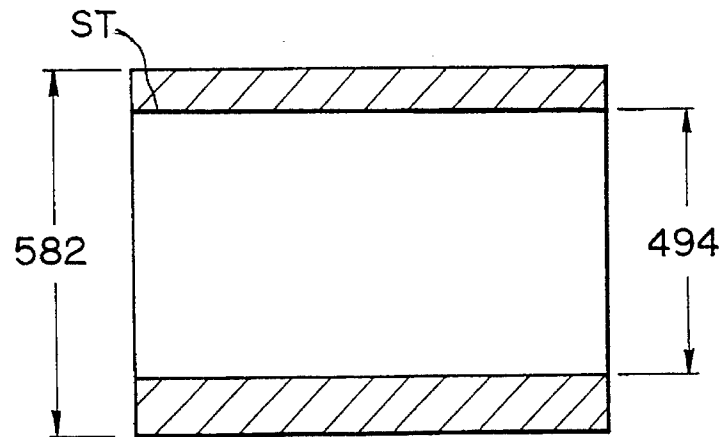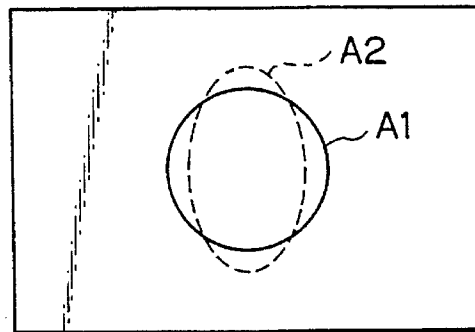
3 Claims, 9 Drawing Sheets

Fig. 1

Fig. 2
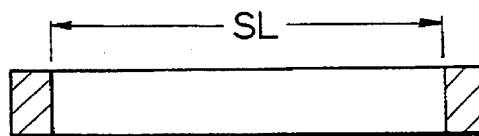

Fig. 4

Fig. 5A
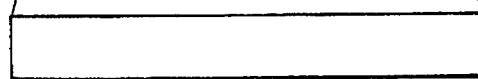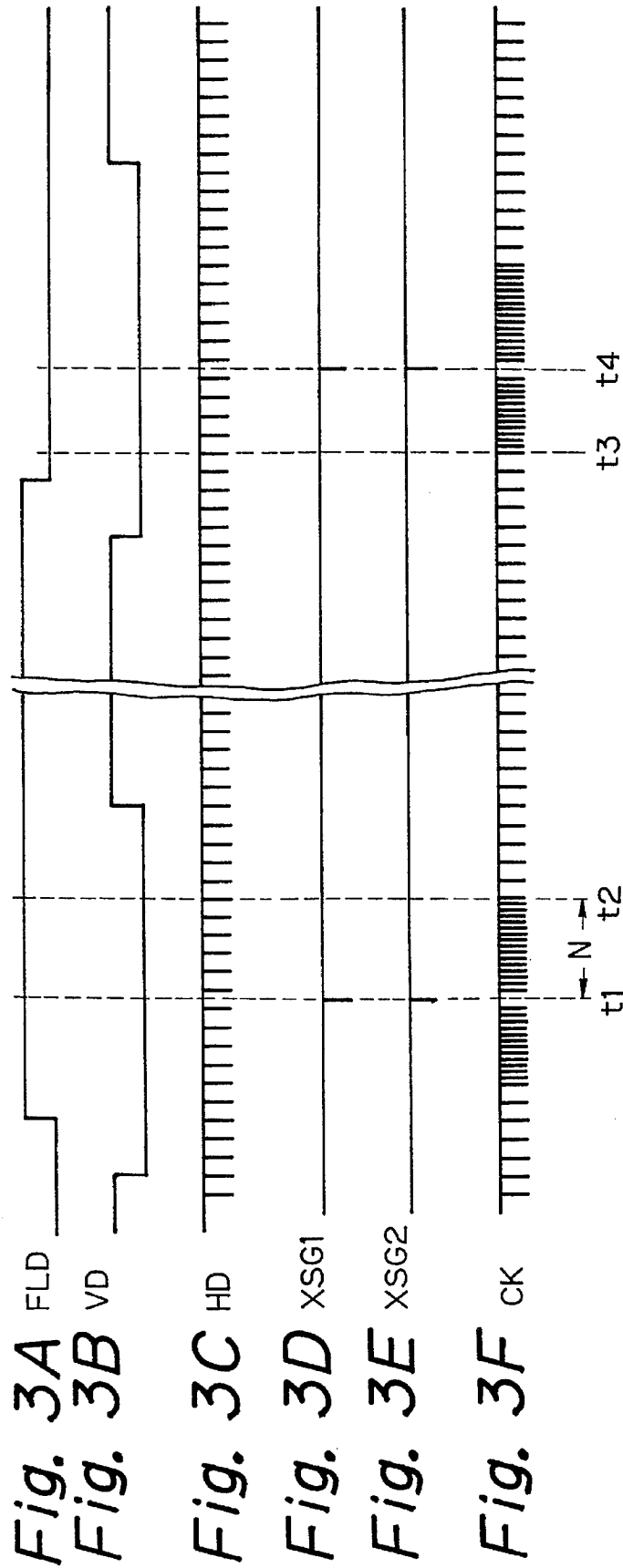
Fig. 5B

Fig. 3A FLD

Fig. 3B VD

Fig. 3C HD

Fig. 3D XSG1

Fig. 3E XSG2

Fig. 3F CK

t1   t2   t3   t4
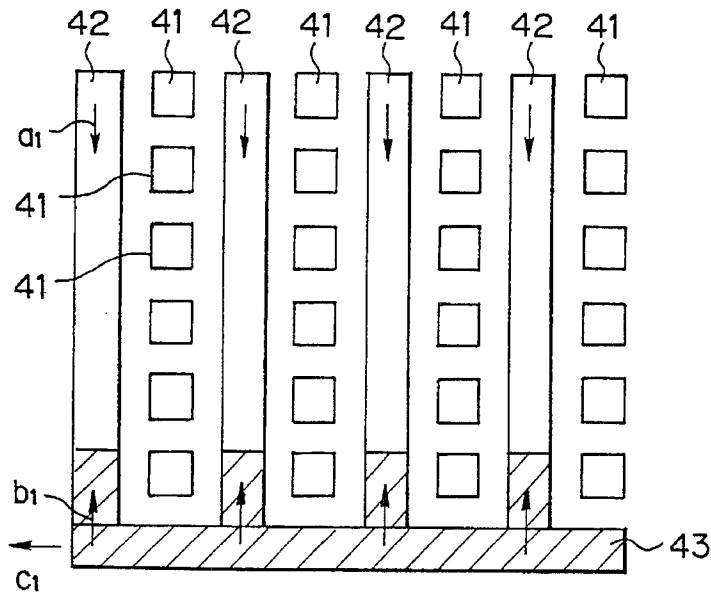
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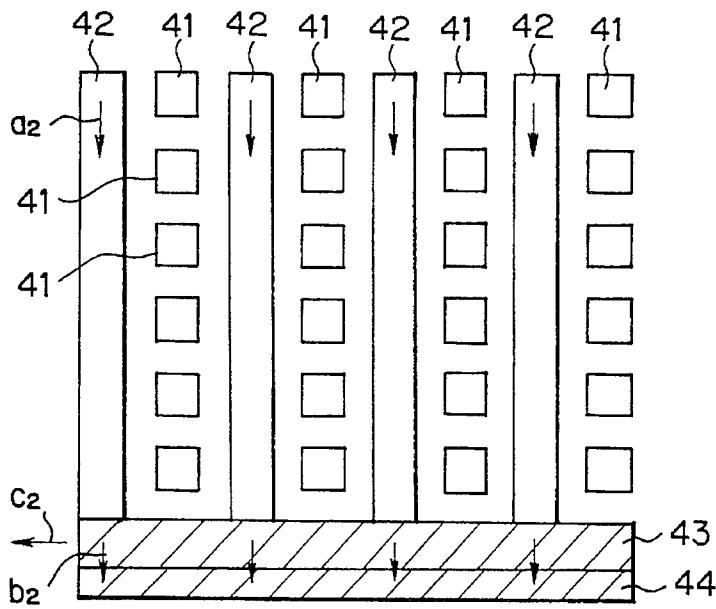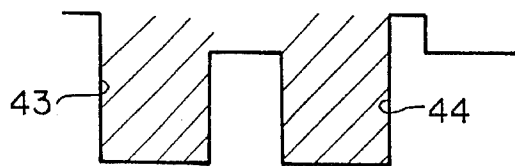
Fig. 6

Fig. 7

Fig. 8

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