



US005748775A

United States Patent [19]

[11] Patent Number: 5,748,775

Tsuchikawa et al.

[45] Date of Patent: May 5, 1998

[54] METHOD AND APPARATUS FOR MOVING OBJECT EXTRACTION BASED ON BACKGROUND SUBTRACTION

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[21] Appl. No.: 401,972

[22] Filed: Mar. 9, 1995

[30] Foreign Application Priority Data

Mar. 9, 1994	[JP]	Japan	6-037438
Feb. 17, 1995	[JP]	Japan	7-029220

[51] Int. Cl.⁶ G06K 9/00; G06K 9/46

[52] U.S. Cl. 382/190; 382/171; 382/170

[58] Field of Search 382/168, 169, 382/170, 171, 172, 190, 192, 309

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[57] ABSTRACT

A moving object extraction based on background subtraction capable of stably extracting the moving object under various environments. Temporal changes of image feature parameter values for sub-regions subdividing a frame of each input image are stored, and the background image is reconstructed by statistically processing a temporal change of the image feature parameter values for each sub-region within a prescribed target region of the frame over a prescribed period of time to obtain the statistical quantity characterizing that temporal change, judging whether that temporal change is due to an illumination change or not according to the obtained statistical quantity and a prescribed illumination change judging condition, and updating a background image value for each sub-region by a new background image value according to the image feature parameter values for each sub-region during the prescribed period of time. Then, a subtraction processing is applied to one of the input images and the reconstructed background image, and a binarization processing is applied to the obtained subtraction image so as to extract the moving object region from the input images.

40 Claims, 21 Drawing Sheets

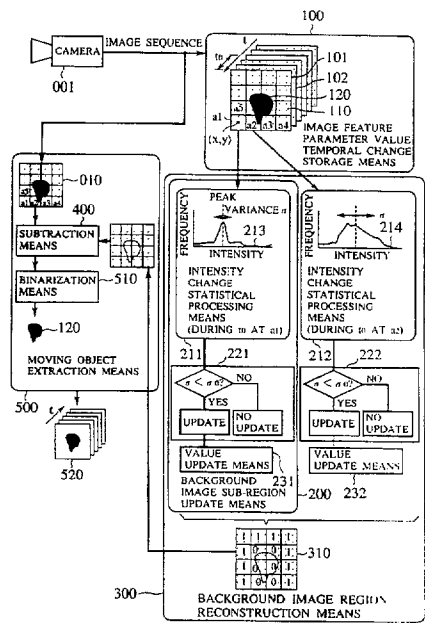


FIG. 1
PRIOR ART

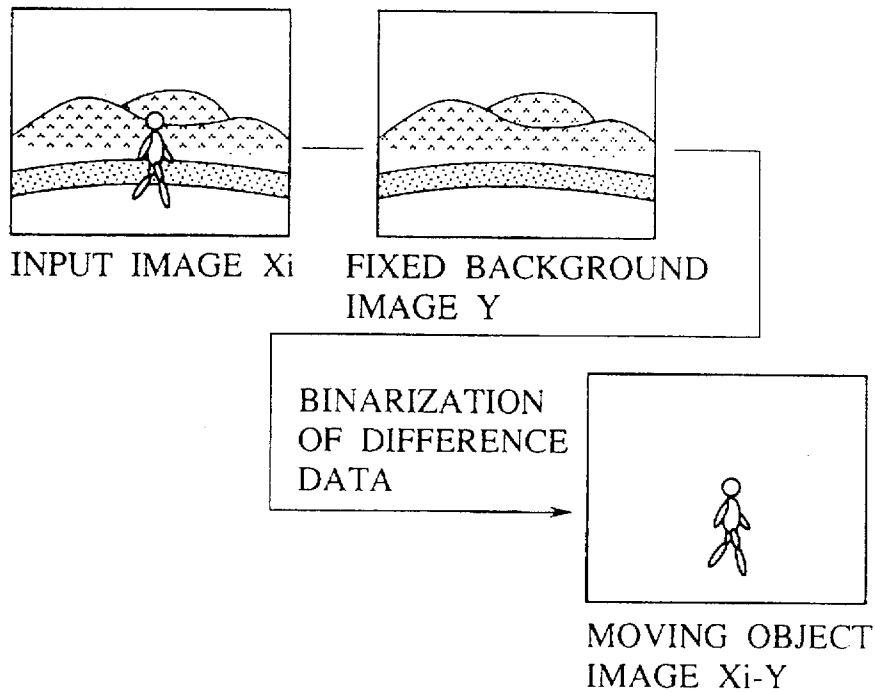
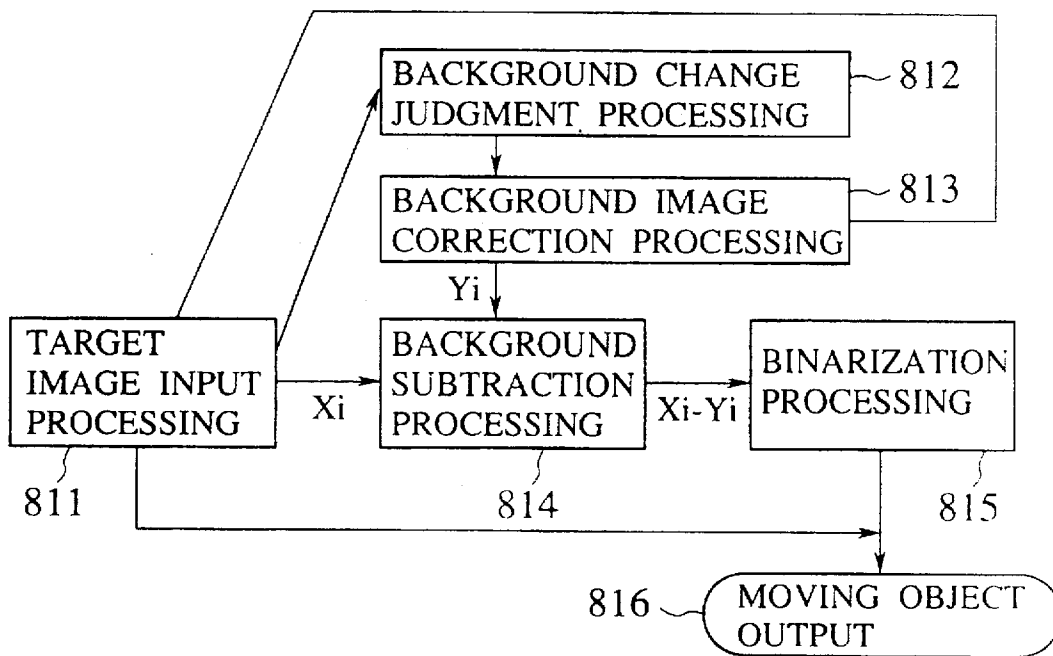


FIG. 2
PRIOR ART



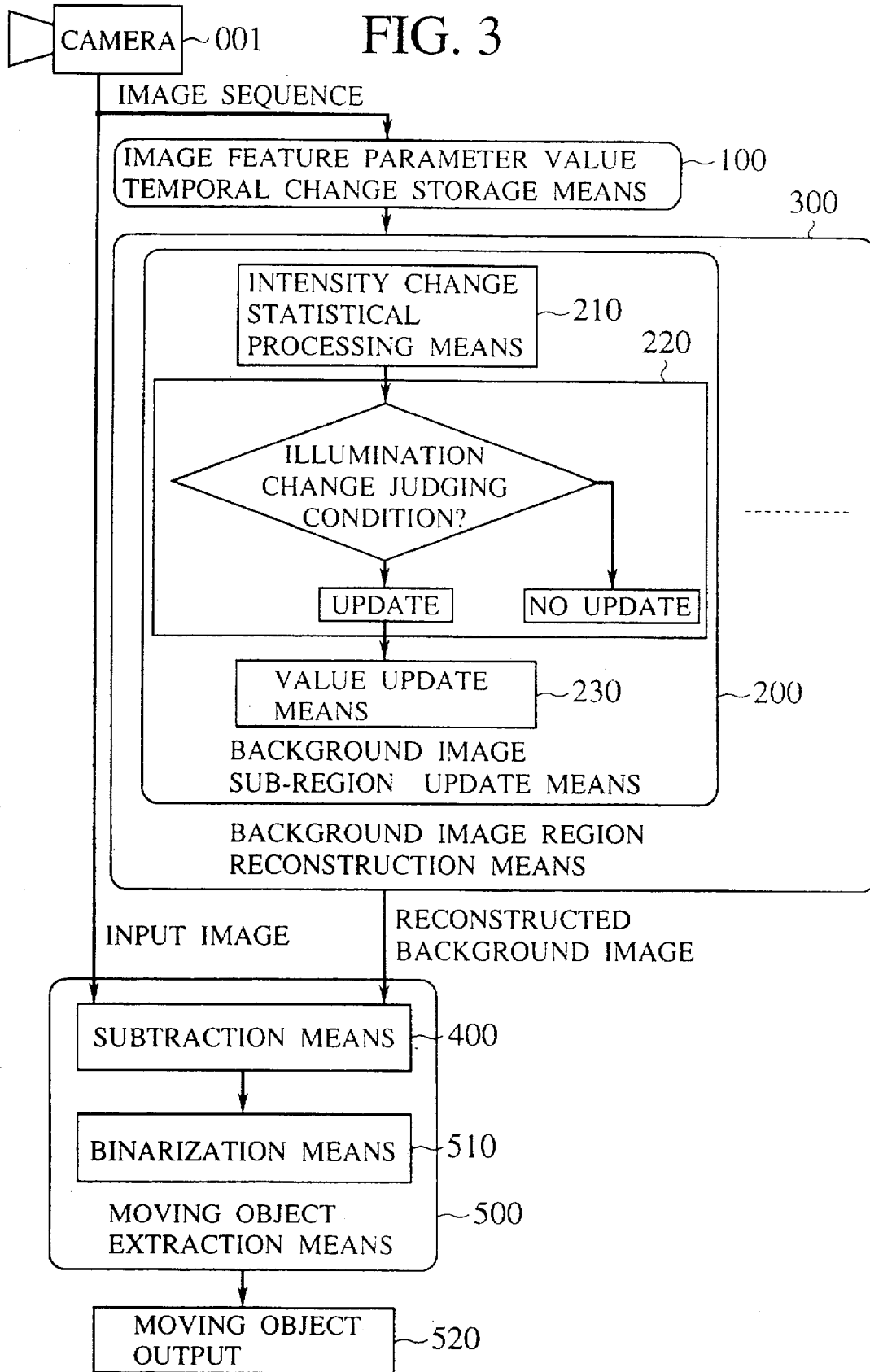


FIG. 4

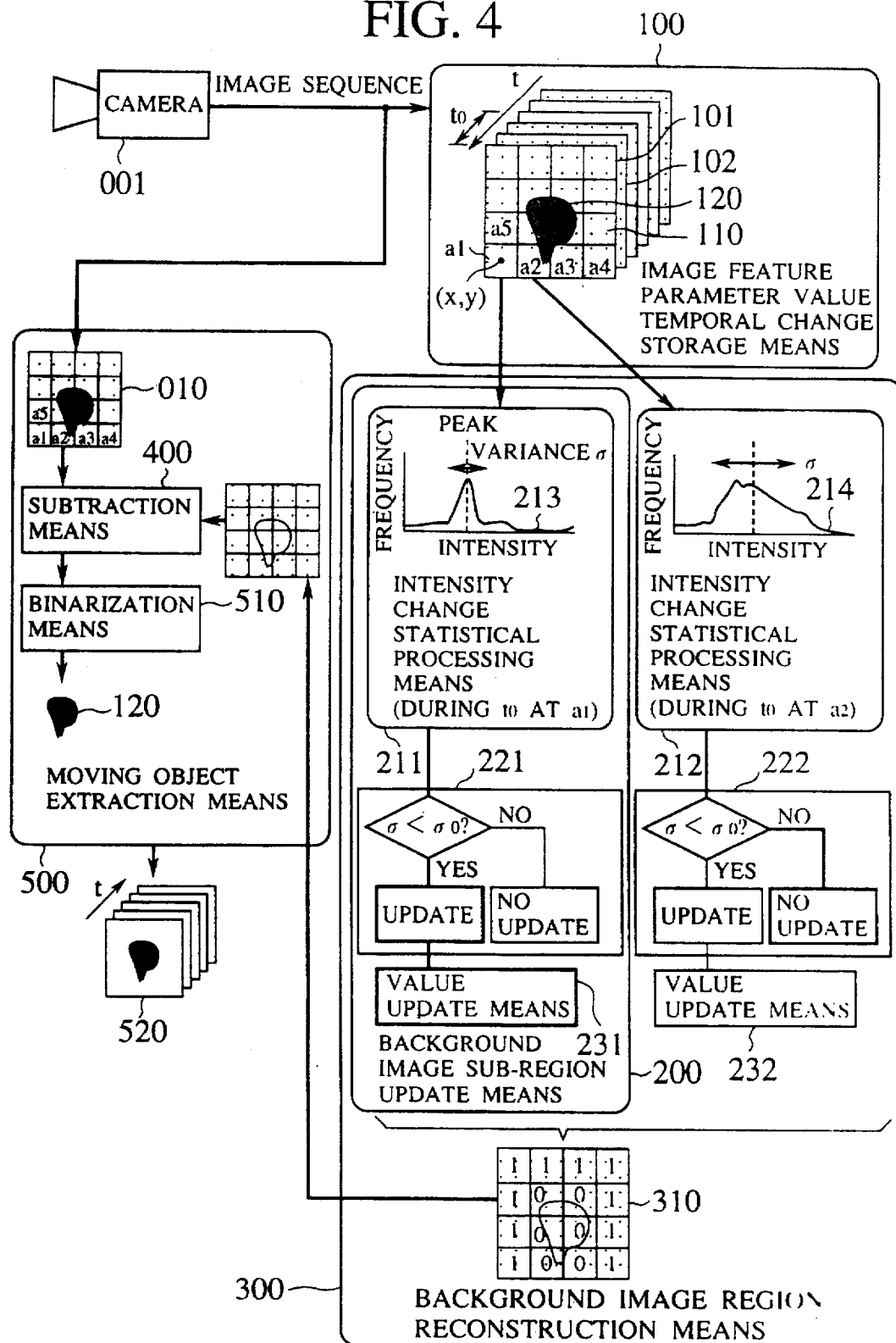


FIG. 5A

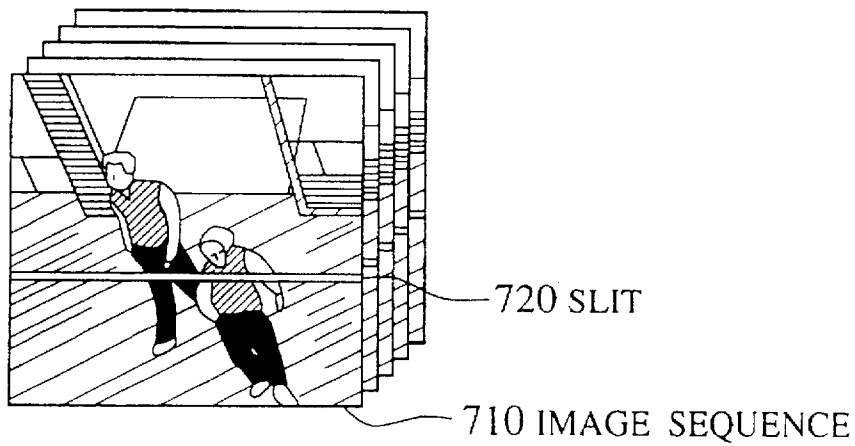


FIG. 5B

SAMPLING POSITION

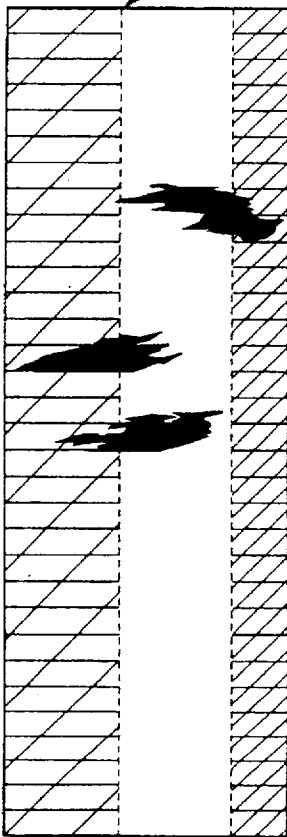


FIG. 5C

742 INPUT
741 BACKGROUND

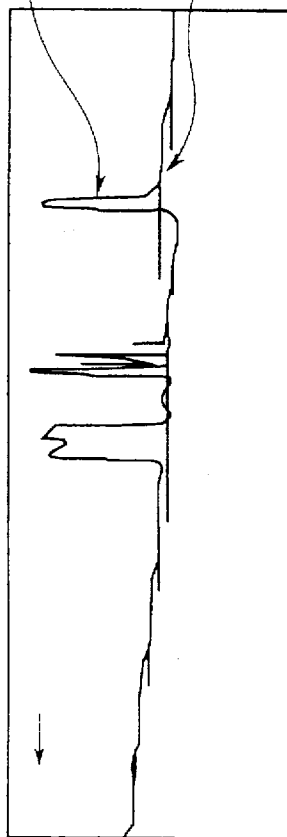
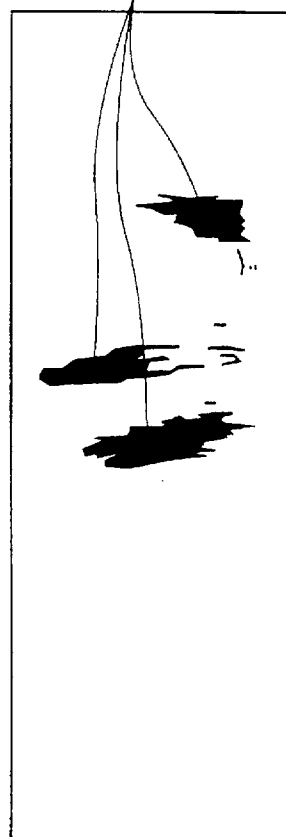


FIG. 5D

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MOVING OBJECT



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