United States Patent [19]

Bernard et al.

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[54] **METHOD FOR THE TEMPORAL FILTERING OF THE NOISE IN AN IMAGE OF A SEQUENCE OF DIGITAL IMAGES, AND DEVICE FOR CARRYING OUT THE METHOD**

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[21] Appl. No.: **08/674,061**

[22] Filed: **Jul. 1, 1996**

[30] **Foreign Application Priority Data**

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[51] **Int. Cl.**[6] **G06K 9/40**

[52] **U.S. Cl.** **382/260**; 382/265; 382/275; 382/132

[58] **Field of Search** 382/128, 132, 382/254, 260, 265, 275; 378/98.2, 156

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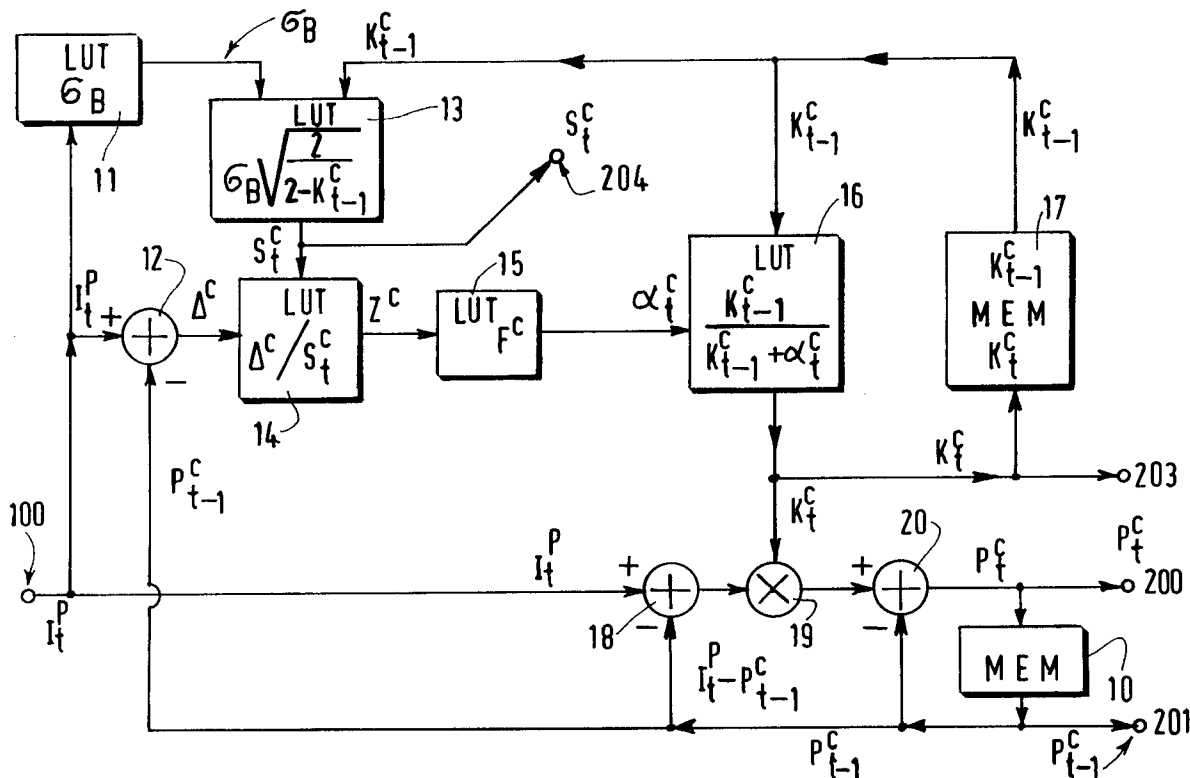|			
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Attorney, Agent, or Firm—Dwight H. Renfrew, Jr.

[57] **ABSTRACT**

A method for the temporal filtering of a sequence of digitized noisy images includes the evaluation of an anti-causal filtered sample (P_t^A) in order to reconstruct a present noisy sample (I_t^P) of a given pixel in a present image by an anti-causal linear combination of a causal filtered sample (P_t^C) obtained by preliminary causal linear temporal filtering in association with coefficients (b_j^C) and an anti-causal noisy sample (I_{t+1}^A). To the samples (P_t^C, I_{t+1}^A) there are assigned weights calculated as functions of a causal gain factor (K_t^C), equal to the inverse of the sum of the coefficients of the causal linear filtering, and an anti-causal continuity coefficient (α_t^A), the weight of the anti-causal sample (I_{t+1}^A) being equal to the probability of intensity continuity between the anti-causal sample (I_{t+1}^A) and a previous filtered sample (P_t^C, P_{t-1}^C) in the sequence. A device for carrying out the method is configured for calculating the anti-causal linear combination.
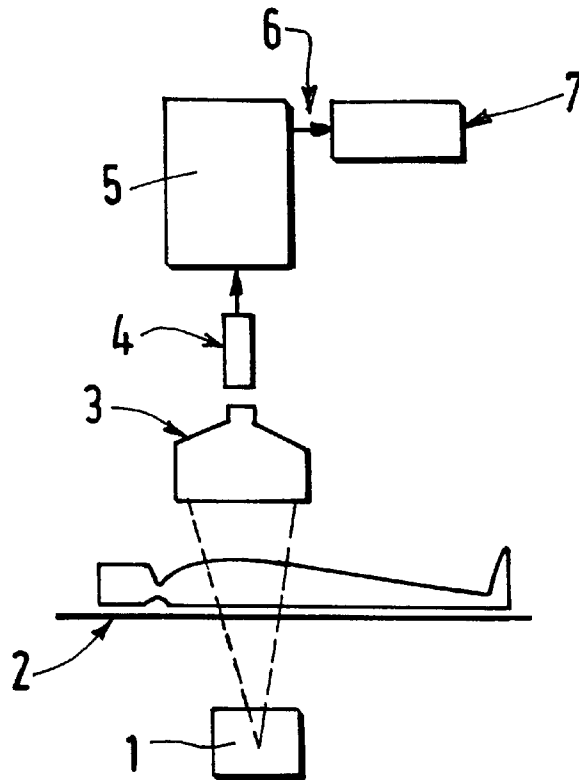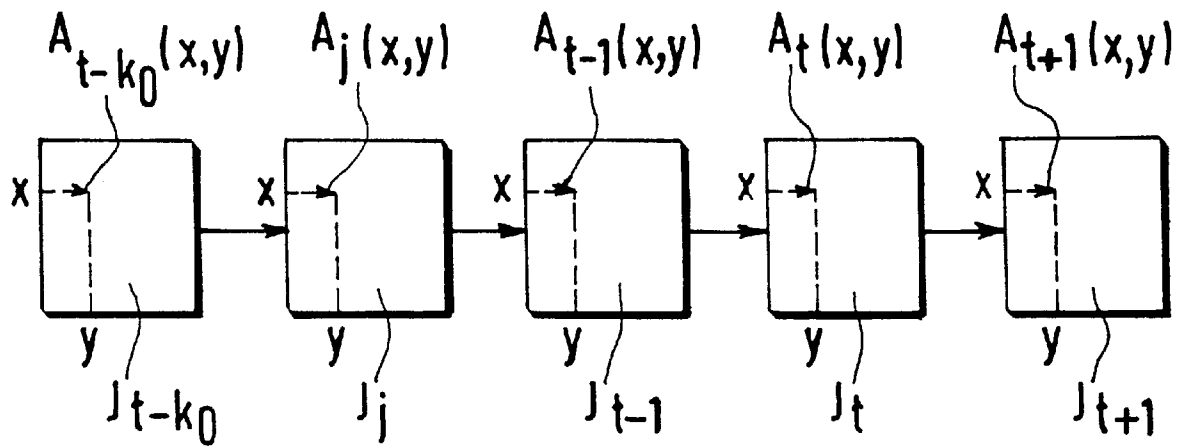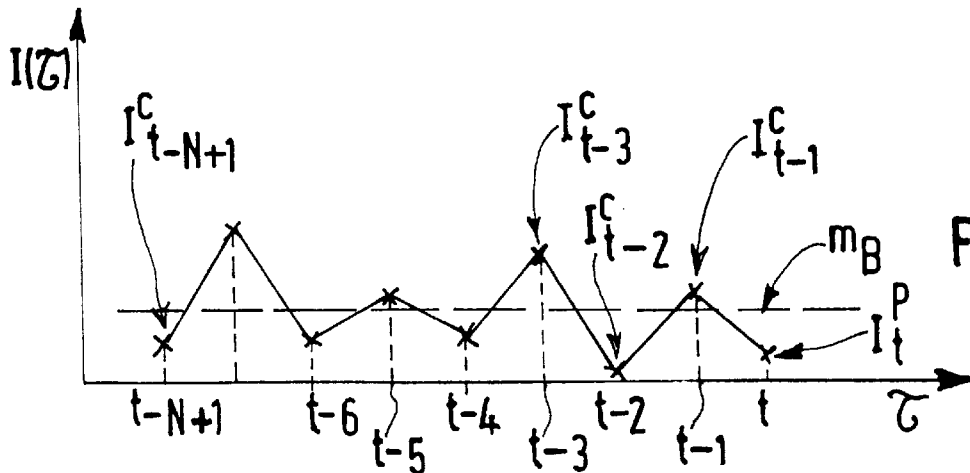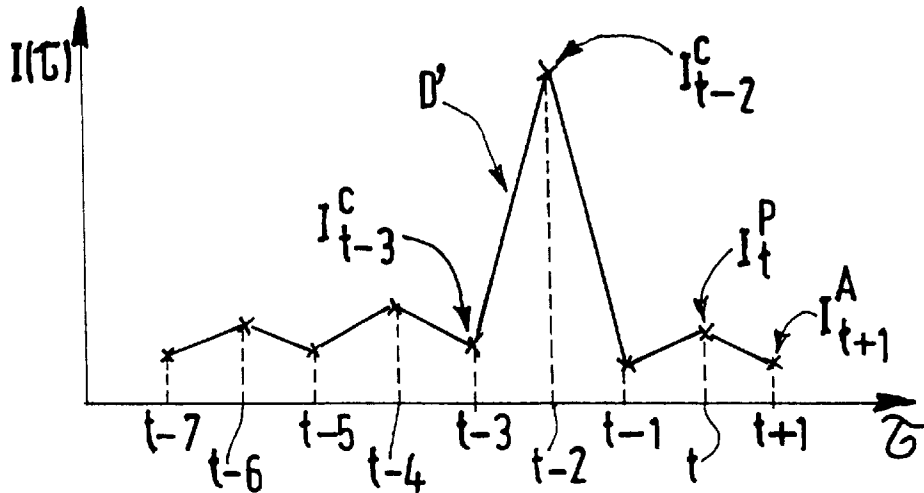
20 Claims, 7 Drawing Sheets

FIG.1

$$A_{t-k_0}(x,y) \qquad A_j(x,y) \qquad A_{t-1}(x,y) \qquad A_t(x,y) \qquad A_{t+1}(x,y)$$

FIG.2

FIG.3A

FIG.3B
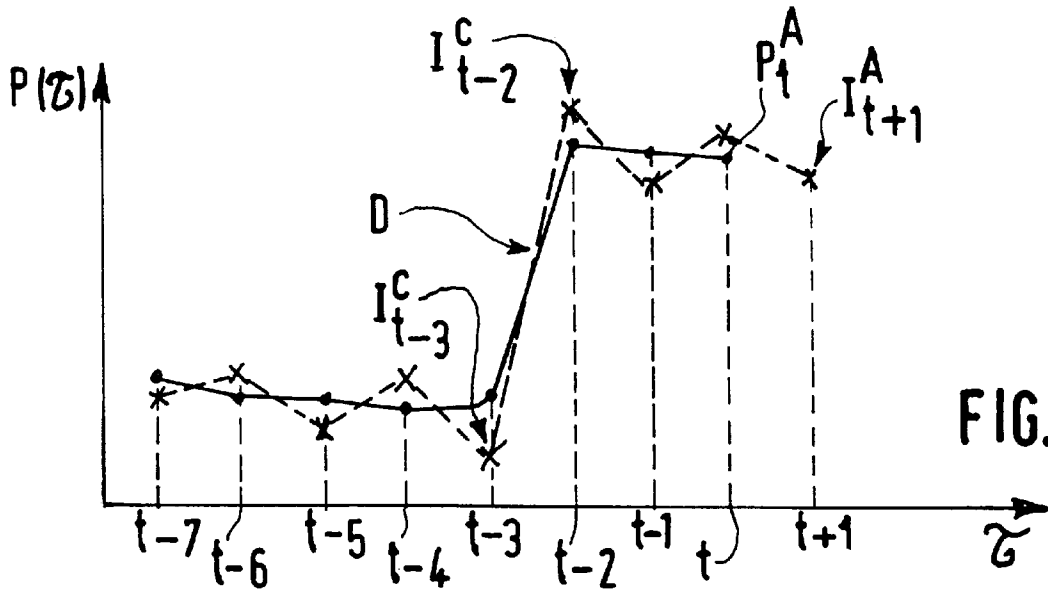

FIG.3C

FIG.4 A

FIG.4B

FIG.4C
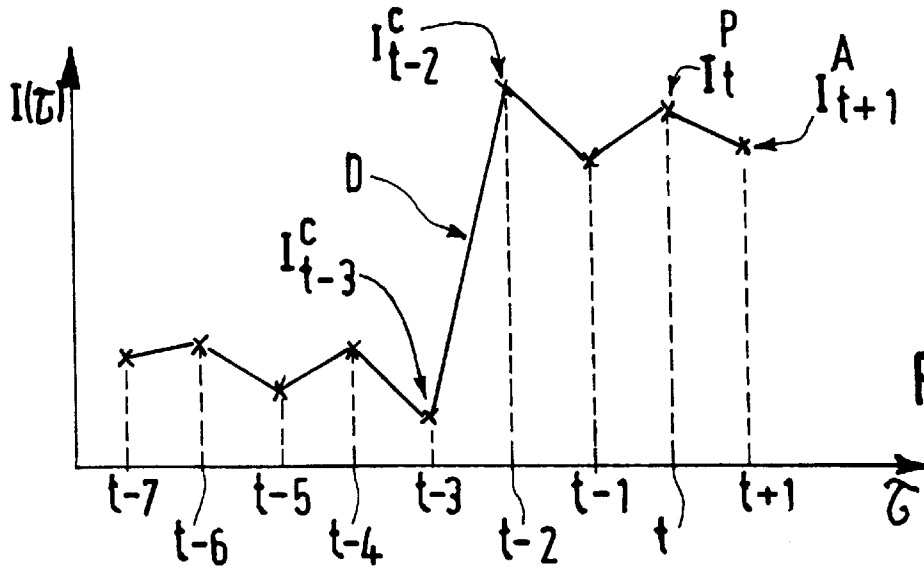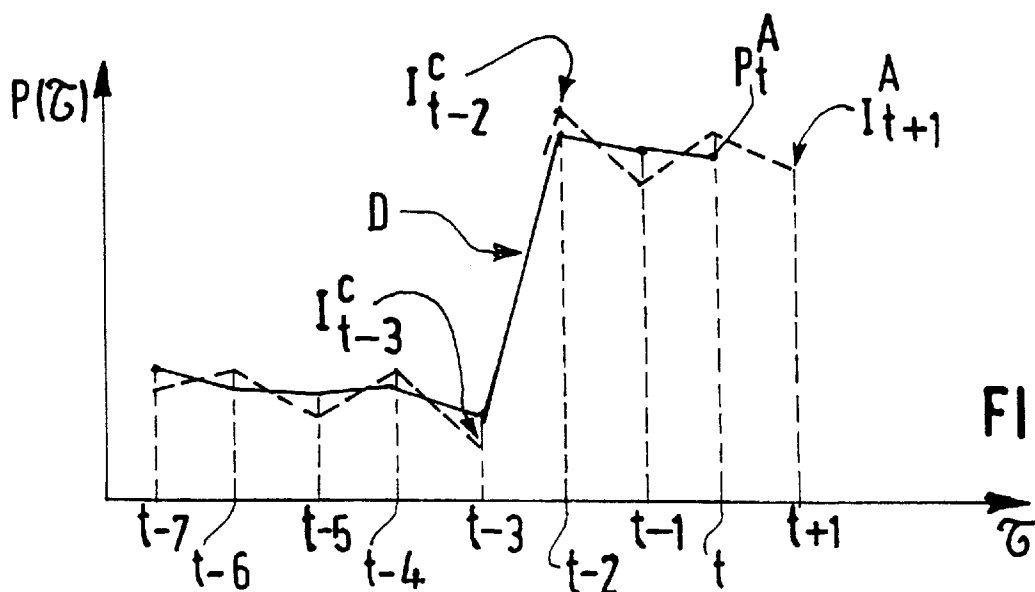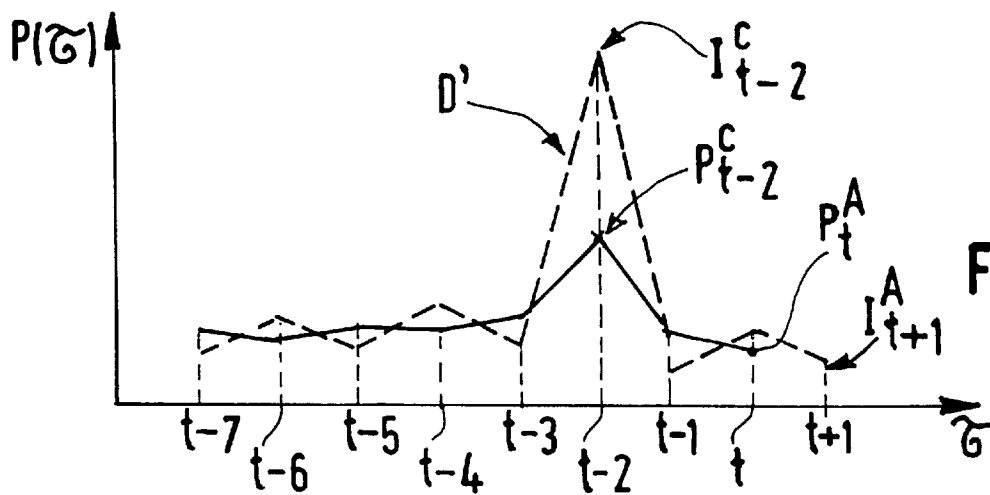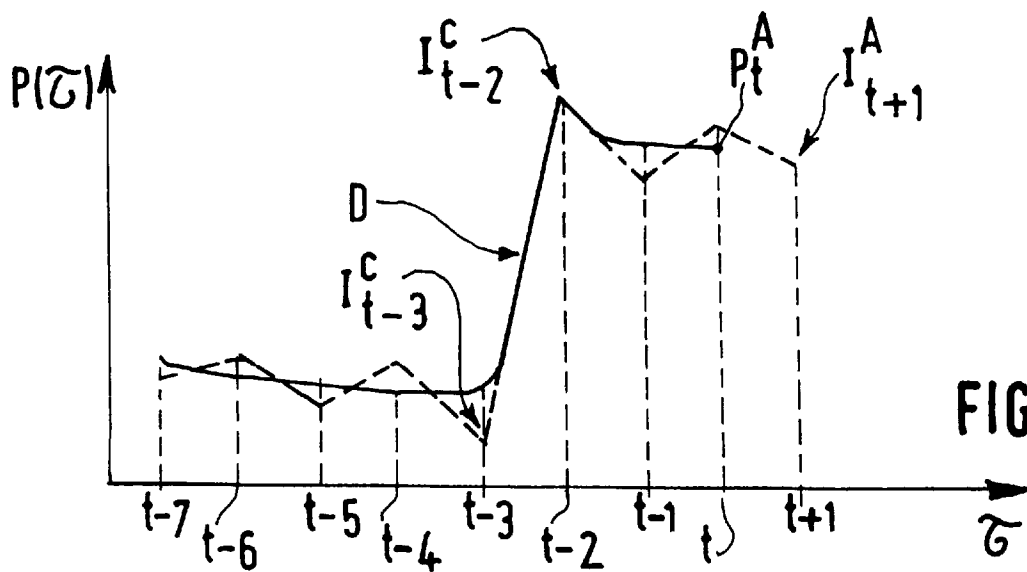
FIG.5A

FIG.5B

FIG.5C

DOCKET ALARM
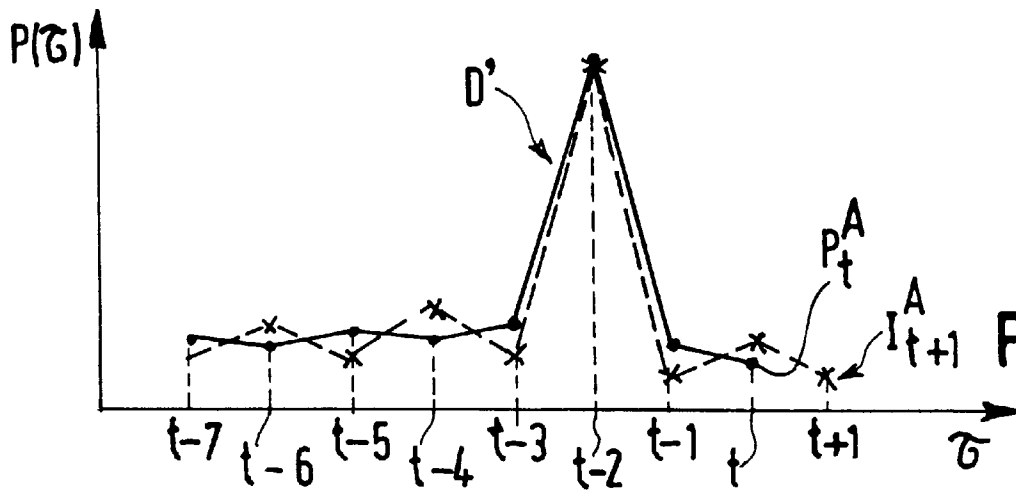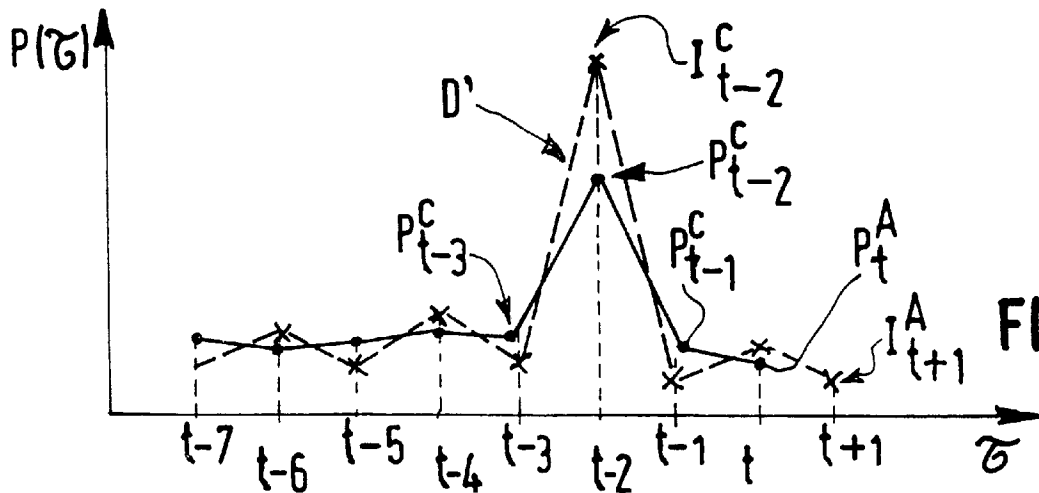
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