



- [54] **MOTION BASED EVENT DETECTION SYSTEM AND METHOD**
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- [73] Assignee: **Texas Instruments Incorporated**, Dallas, Tex.
- [21] Appl. No.: **08/795,432**
- [22] Filed: **Feb. 5, 1997**

**Related U.S. Application Data**

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- [51] Int. Cl.<sup>6</sup> ..... **H04N 7/18**
- [52] U.S. Cl. .... **348/143; 348/135; 348/155**
- [58] Field of Search ..... 348/135, 142, 348/152, 154, 155, 143, 171, 172; 382/103, 107, 236

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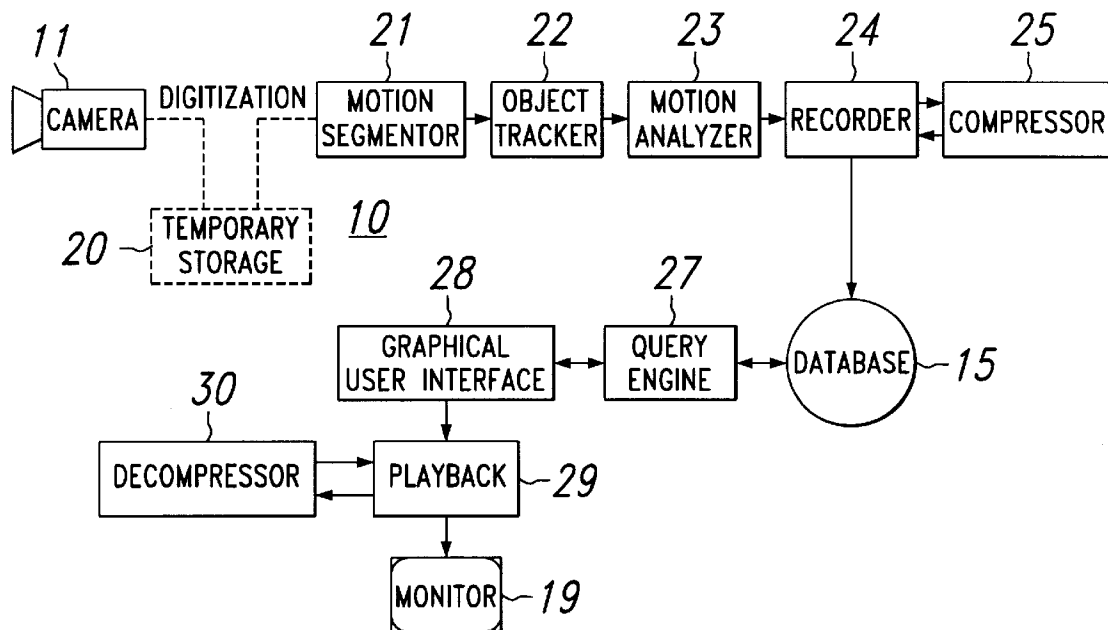
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[57] **ABSTRACT**

A method to provide automatic content-based video indexing from object motion is described. Moving objects in video from a surveillance camera 11 detected in the video sequence using motion segmentation methods by motion segmentor 21. Objects are tracked through segmented data in an object tracker 22. A symbolic representation of the video is generated in the form of an annotated graphics describing the objects and their movement. A motion analyzer 23 analyzes results of object tracking and annotates the graph motion with indices describing several events. The graph is then indexed using a rule based classification scheme to identify events of interest such as appearance/disappearance, deposit/removal, entrance/exit, and motion/rest of objects. Clips of the video identified by spatio-temporal, event, and object-based queries are recalled to view the desired video.

22 Claims, 11 Drawing Sheets



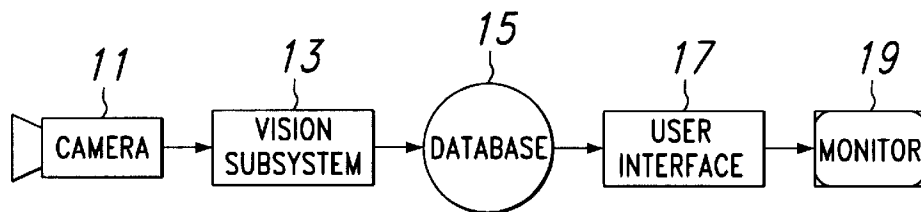


Fig. 1

10

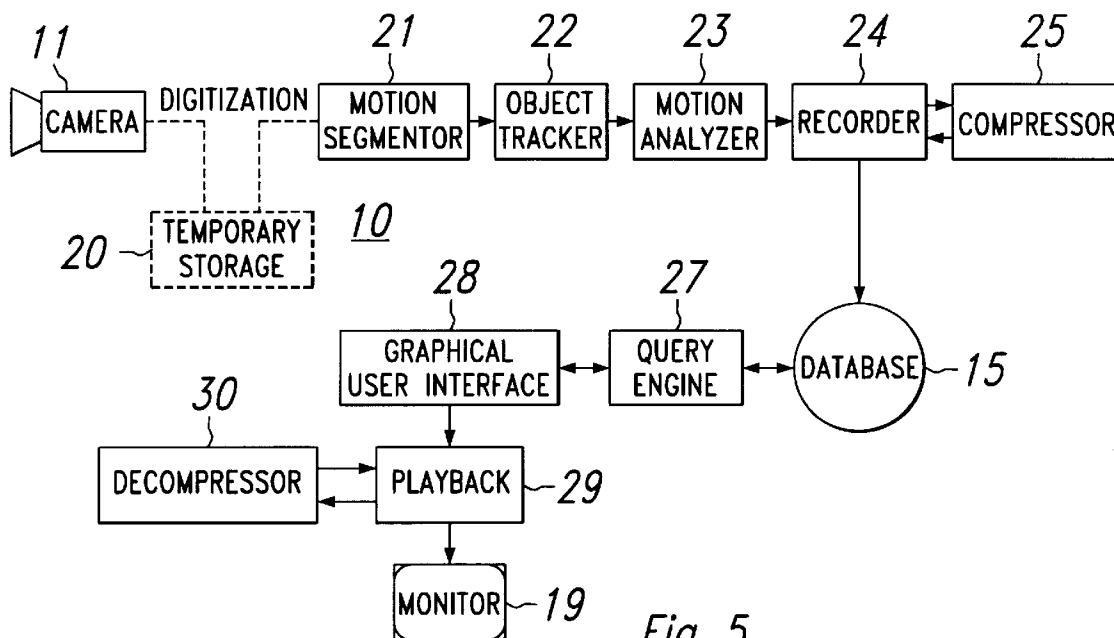


Fig. 5

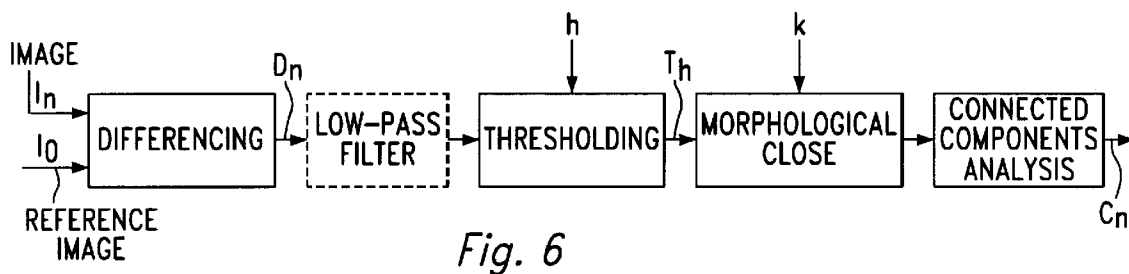


Fig. 6

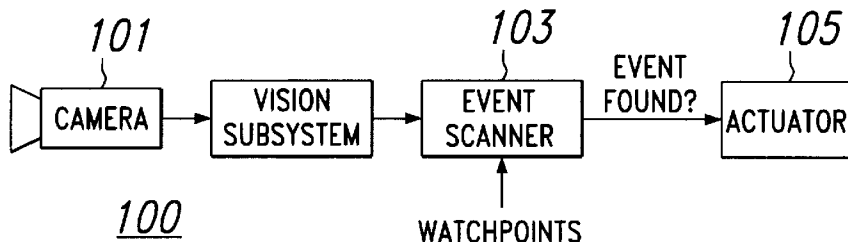


Fig. 27

100

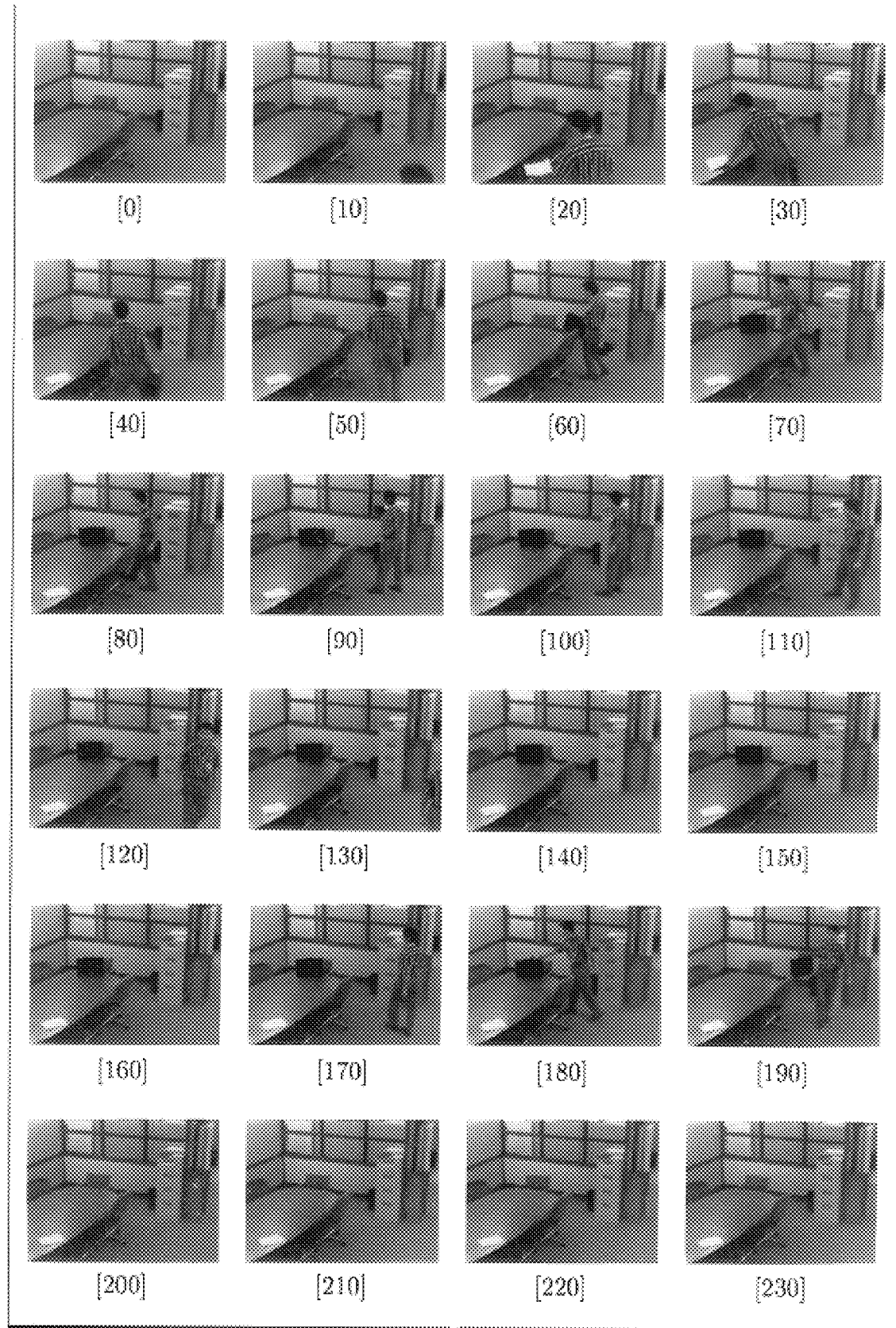


Fig. 2

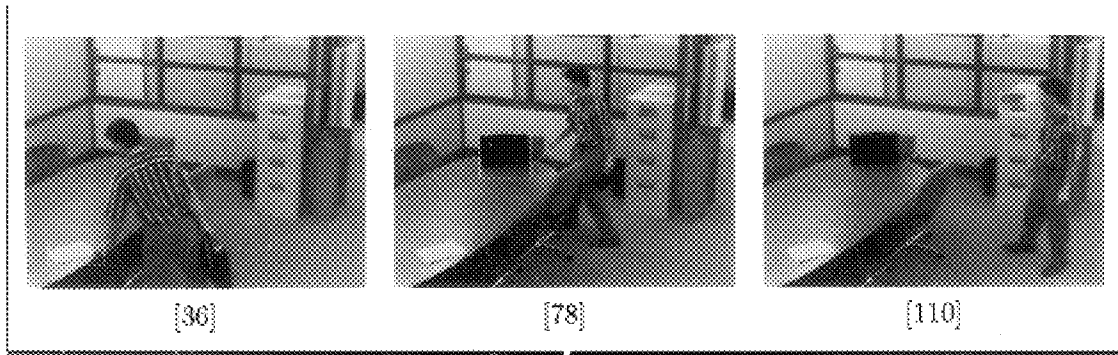


Fig. 3

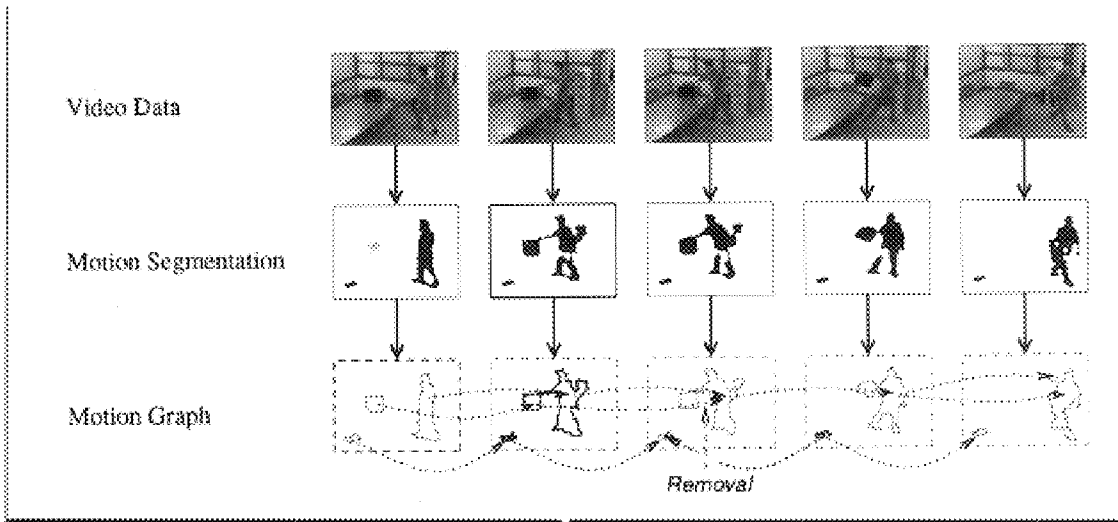


Fig. 4

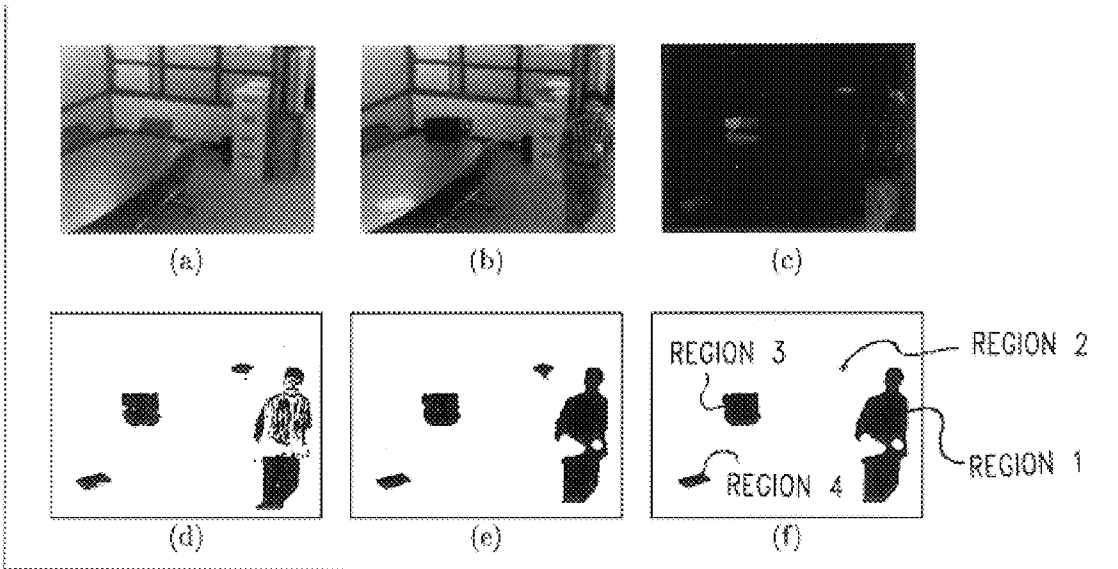


Fig. 7



Fig. 8

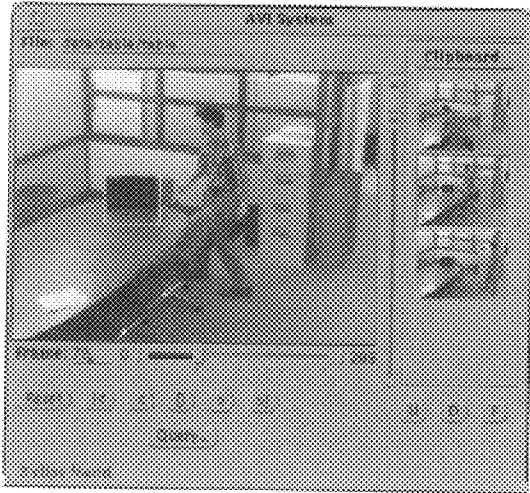


Fig. 24a

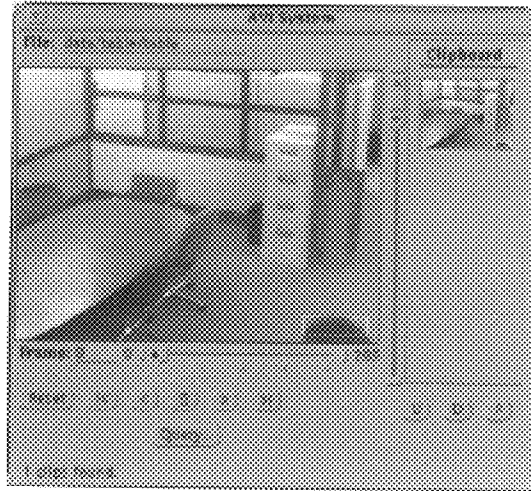


Fig. 24b

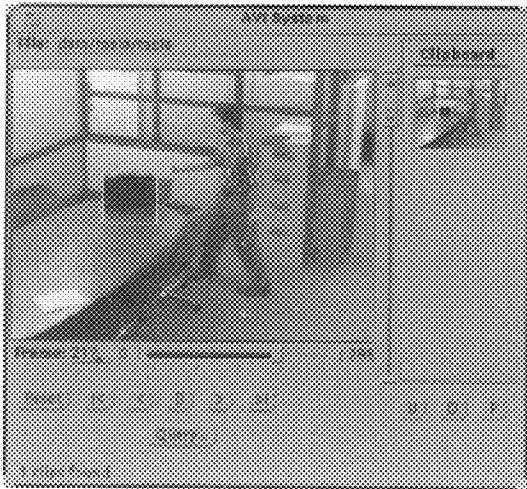


Fig. 24c

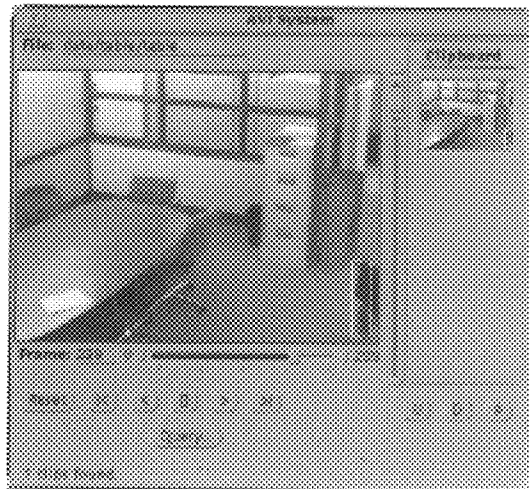


Fig. 24d

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