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(54) **VIDEO SURVEILLANCE SYSTEM EMPLOYING VIDEO PRIMITIVES**

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Related U.S. Application Data

(63) Continuation-in-part of application No. 11/057,154, filed on Feb. 15, 2005, which is a continuation-in-part of application No. 09/987,707, filed on Nov. 15, 2001, now abandoned, which is a continuation-in-part of application No. 09/694,712, filed on Oct. 24, 2000, now Pat. No. 6,954,498.

(51) **Int. Cl.**
H04N 7/18 (2006.01)

(52) **U.S. Cl.**
USPC **348/143**

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/012,878, please refer to the USPTO's public Patent Application Information Retrieval (PAIR) system under the Display References tab.

Primary Examiner — Adam L Basehoar

(57) **ABSTRACT**

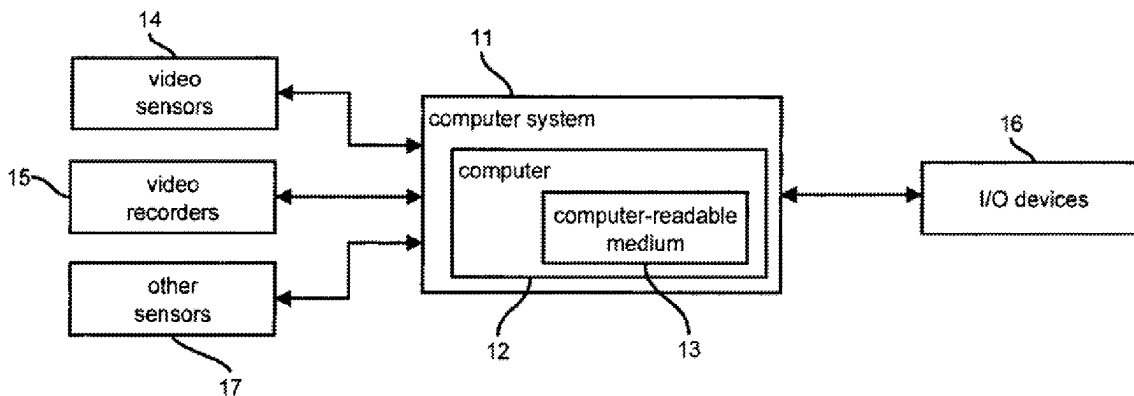A video surveillance system extracts video primitives and extracts event occurrences from the video primitives using event discriminators. The system can undertake a response, such as an alarm, based on extracted event occurrences.

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EX PARTE
REEXAMINATION CERTIFICATE
ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS
INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1-4** and **6-22** is confirmed.

Claim **5** is cancelled.

New claims **23-36** are added and determined to be patentable.

23. A video system comprising:

a first processor which analyzes a video to determine attributes of objects detected in the video, the first processor being in communication with a first communications link to transfer the determined attributes over the communications link; and

a second processor, separate from the first processor, in communication with the first communications link to receive the determined attributes transferred from the first processor over the first communications link, which determines a first event that is not one of the determined attributes by analyzing a combination of the received determined attributes and which provides, in response to a determination of the first event, at least one of an alert to a user, information for a report, and an instruction for taking an action, wherein analyzing the combination of the received determined attributes comprises filtering,

wherein the first processor determines attributes independent of a selection of the first event by the second processor, and

wherein the second processor determines the first event without reprocessing the video analyzed by the first processor.

24. A video system, comprising:

an input in communication with a communications channel;

a processor configured to receive from the input a stream of detected attributes received over the communications channel, the attributes being attributes of one or more objects detected in a video, the processor configured to determine an event that is not one of the detected attributes by analyzing a combination of the received attributes and configured to provide, upon a determination of the event, at least one of an alert to a user, information for a report and an instruction for taking an action, wherein analyzing the combination of the received attributes comprises filtering,

wherein the attributes received over the communications channel are independent of the event to be determined by the processor, and

wherein the processor is configured to determine the event without reprocessing the video.

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receiving a stream of detected attributes over a communications channel, the detected attributes representing attributes of an object previously detected in the video at a remote location;

performing an analysis of a combination of the detected attributes to detect an event that is not one of the detected attributes without reprocessing the video, wherein the analysis of the combination of the detected attributes comprises filtering,

upon detecting the event, providing at least one of an alert to a user, information for a report and an instruction for taking an action,

wherein the detected attributes received in the stream of attributes are independent of a selection of the event to be detected.

26. A video system comprising:

a first processor which analyzes a video to determine attributes of objects detected in the video, the first processor being in communication with a first communications link to transfer the determined attributes over the communications link; and

a second processor, separate from the first processor, in communication with the first communications link to receive the determined attributes transferred from the first processor over the first communications link, which determines a first event that is not one of the determined attributes by analyzing a combination of the received determined attributes and which provides, in response to a determination of the first event, at least one of an alert to a user, information for a report, and an instruction for taking an action,

wherein the attributes of objects detected in the video comprise first and second objects, and the first event is the first and second objects coming together,

wherein the first processor determines attributes independent of a selection of the first event by the second processor, and

wherein the second processor determines the first event without reprocessing the video analyzed by the first processor.

27. A video system, comprising:

an input in communication with a communications channel;

a processor configured to receive from the input a stream of detected attributes received over the communications channel, the attributes being attributes of first and second objects detected in a video, the processor configured to determine an event that is not one of the detected attributes by analyzing a combination of the received attributes and configured to provide, upon a determination of the event, at least one of an alert to a user, information for a report and an instruction for taking an action, the event being the first and second objects coming together,

wherein the attributes received over the communications channel are independent of the event to be determined by the processor, and

wherein the processor is configured to determine the event without reprocessing the video.

28. A method of detecting an event from a video, comprising:

receiving a stream of detected attributes over a communications channel, the detected attributes representing attributes of first and second objects previously detected in the video at a remote location;

attributes without reprocessing the video, the event being the first and second objects coming together,

upon detecting the event, providing at least one of an alert to a user, information for a report and an instruction for taking an action,

wherein the detected attributes received in the stream of attributes are independent of a selection of the event to be detected.

29. A method comprising:

analyzing a video to detect first and second objects;

creating a stream of attributes at a first location by determining attributes of the detected first object and attributes of the detected second object by analyzing the video;

transmitting the stream of attributes to a second location removed from the first location for subsequent analysis,

wherein the stream of attributes are transmitted to the second location over a communications channel, and

wherein the stream of attributes is sufficient to allow the subsequent analysis to detect an event of the video to provide at least one of an alert to a user, information for a report and an instruction for taking an action, the event not being one of the determined attributes, the event being the first and second objects coming together,

wherein the stream of attributes is sufficient to allow detection of the event that is not one of the determined attributes without reprocessing the video of the first location.

30. A video device, comprising:

a processor at a first location which analyzes a video to detect first and second objects and to determine attributes of the first object detected in the video and attributes of the second object detected in the video;

an output configured to transmit the attributes determined by the processor over a communications link,

wherein the output is configured to transmit the attributes to a second location removed from the processor for a subsequent analysis of a combination of the attributes at the second location,

wherein the processor determines attributes independently of a subsequent analysis of a combination of attributes to determine an event that is not one of the determined attributes, the event being the first and second objects coming together, and

wherein the attributes are sufficient to allow detection of an event to provide at least one of an alert to a user, information for a report and an instruction for taking an action, the event not being one of the determined attributes and being determinable by analyzing the combination of the attributes,

wherein the attributes are sufficient to allow detection of an event without reprocessing the video of the first location.

31. A video system comprising:

a first processor which analyzes a video to determine attributes of objects detected in the video, the first processor being in communication with a first communications link to transfer the determined attributes over the communications link; and

a second processor, separate from the first processor, in communication with the first communications link to receive the determined attributes transferred from the first processor over the first communications link, which determines a first event that is not one of the determined

attributes by analyzing a combination of the received determined attributes and which provides, in response to a determination of the first event, at least one of an alert to a user, information for a report, and an instruction for taking an action, wherein analyzing the combination of the received determined attributes comprises filtering,

wherein the attributes of objects detected in the video comprise first and second objects, and the first event is the first and second objects coming together,

wherein the first processor determines attributes independent of a selection of the first event by the second processor, and

wherein the second processor determines the first event without reprocessing the video analyzed by the first processor.

32. A video system, comprising:

an input in communication with a communications channel;

a processor configured to receive from the input a stream of detected attributes received over the communications channel, the attributes being attributes of first and second objects detected in a video, the processor configured to determine an event that is not one of the detected attributes by analyzing a combination of the received attributes and configured to provide, upon a determination of the event, at least one of an alert to a user, information for a report and an instruction for taking an action, the event being the first and second objects coming together, wherein analyzing the combination of the received attributes comprises filtering,

wherein the attributes received over the communications channel are independent of the event to be determined by the processor, and

wherein the processor is configured to determine the event without reprocessing the video.

33. A method of detecting an event from a video, comprising:

receiving a stream of detected attributes over a communications channel, the detected attributes representing attributes of first and second objects previously detected in the video at a remote location;

performing an analysis of a combination of the detected attributes to detect an event that is not one of the detected attributes without reprocessing the video, wherein the analysis of the combination of the detected attributes comprises filtering, the event being the first and second objects coming together,

upon detecting the event, providing at least one of an alert to a user, information for a report and an instruction for taking an action,

wherein the detected attributes received in the stream of attributes are independent of a selection of the event to be detected.

34. The video system of claim 23, wherein the filtering comprises filtering the combination of the received determined attributes to determine if the first event occurred.

35. The video system of claim 24, wherein the filtering comprises filtering the combination of the received attributes to determine if the event occurred.

36. The method of claim 25, wherein the filtering comprises filtering the combination of the detected attributes to determine if the event occurred.

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