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**Sandrew**

(10) **Patent No.: US 7,907,793 B1**
(45) **Date of Patent: Mar. 15, 2011**

(54) **IMAGE SEQUENCE DEPTH ENHANCEMENT SYSTEM AND METHOD**

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(21) Appl. No.: **12/542,498**

(22) Filed: **Aug. 17, 2009**

**Related U.S. Application Data**

(60) Continuation-in-part of application No. 12/032,969, filed on Feb. 18, 2008, now Pat. No. 7,577,312, which is a continuation of application No. 11/324,815, filed on Jan. 4, 2006, now Pat. No. 7,333,670, which is a division of application No. 10/450,970, filed as application No. PCT/US02/14192 on May 6, 2002, now Pat. No. 7,181,081.

(60) Provisional application No. 60/288,929, filed on May 4, 2001.

(51) **Int. Cl.**
***G06K 9/36*** (2006.01)

(52) **U.S. Cl.** ..... **382/284**; 382/154; 382/307; 348/576; 348/586

(58) **Field of Classification Search** ..... 382/154, 382/284, 294, 307; 348/576, 586
See application file for complete search history.

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(57) **ABSTRACT**

Motion picture scenes to be colorized/depth enhanced (2D→3D) are broken into separate elements, backgrounds/sets or motion/onscreen-action. Background and motion elements are combined separately into single frame representations of multiple frames which becomes a visual reference database that includes data for all frame offsets used later for the computer controlled application of masks within a sequence of frames. Each pixel address within the database corresponds to a mask/lookup table address within the digital frame and X, Y, Z location of subsequent frames. Masks are applied to subsequent frames of motion objects based on various differentiating image processing methods, including automated mask fitting of all masks or single masks in an entire frame, bezier and polygon tracing of selected regions with edge detected shaping and operator directed detection of subsequent regions. Colors and/or depths are automatically applied to masks throughout a scene from the composite background and to motion objects.

**20 Claims, 63 Drawing Sheets**
**(6 of 63 Drawing Sheet(s) Filed in Color)**

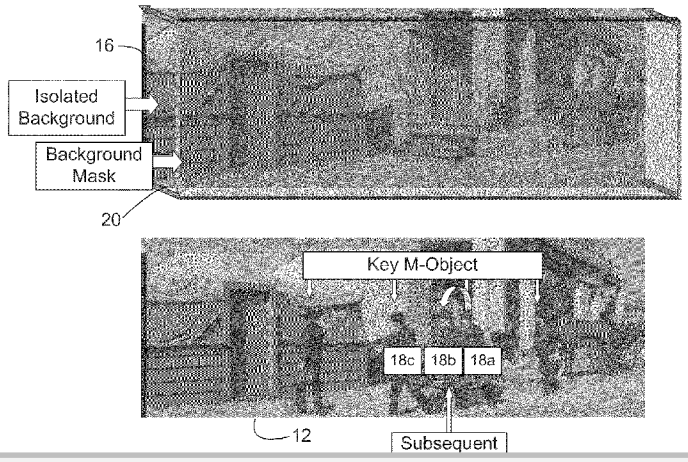


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Figure 1

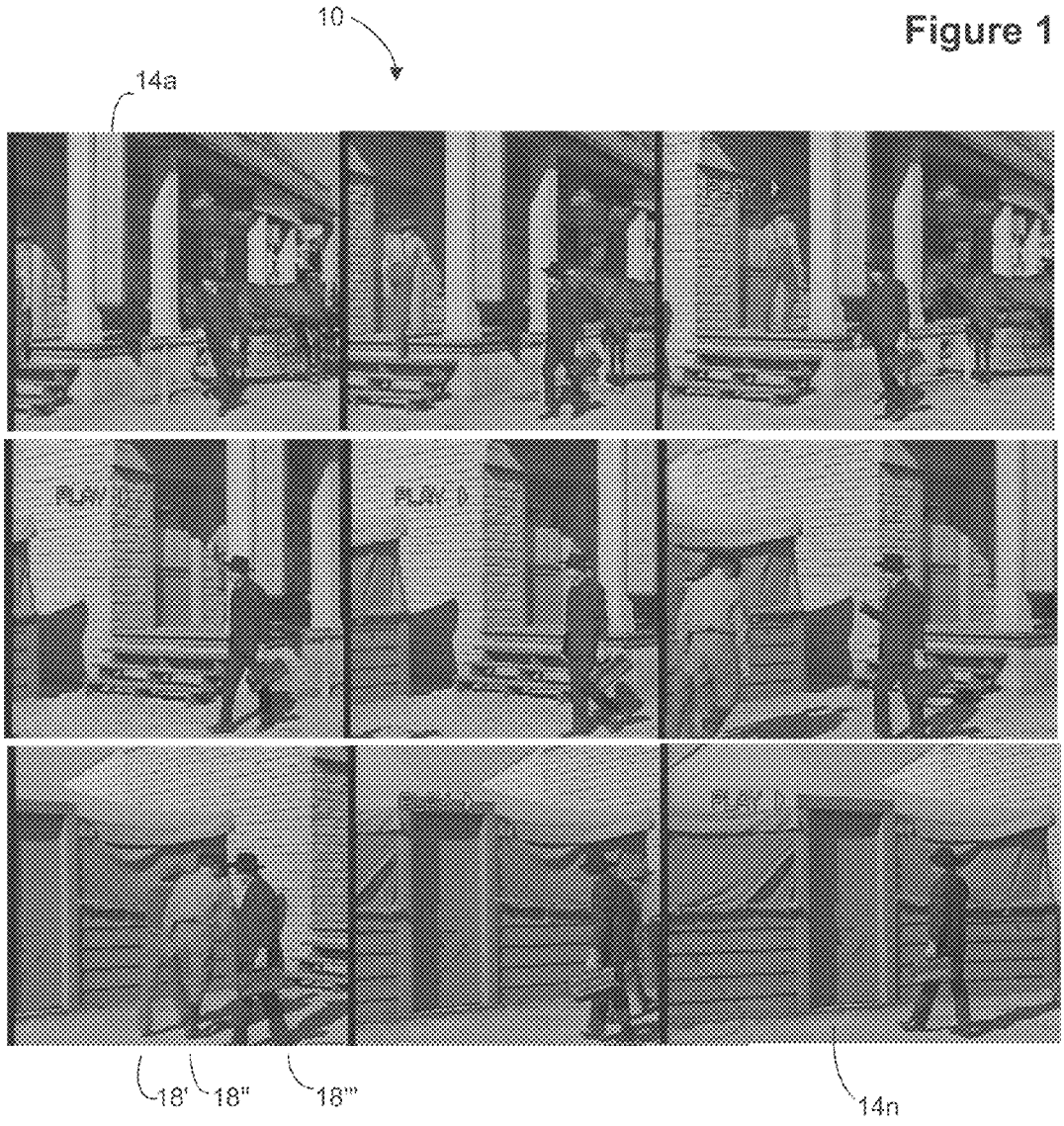


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Figure 2

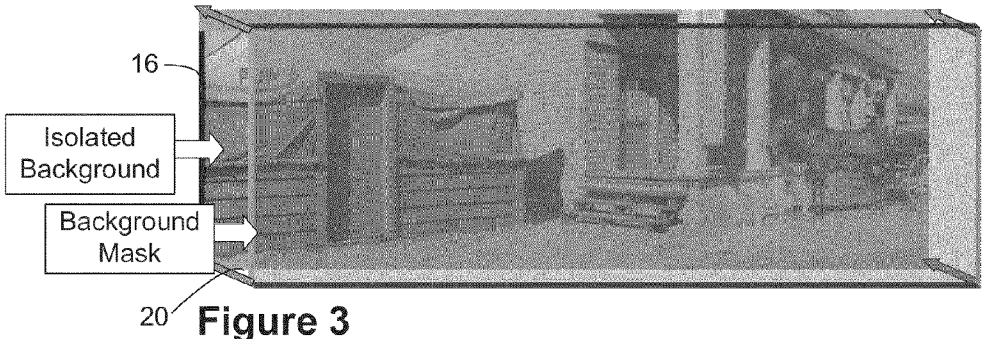



Figure 3

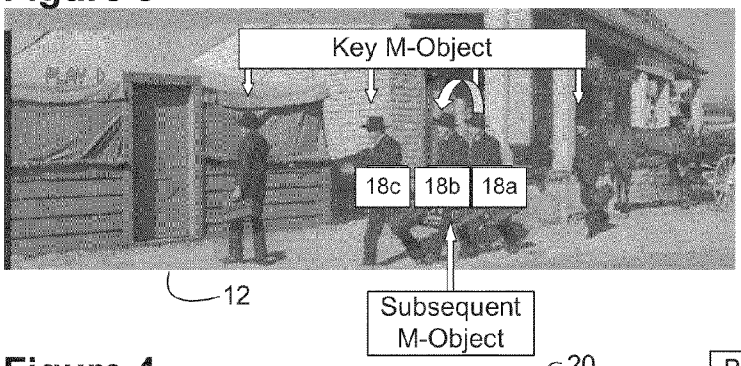
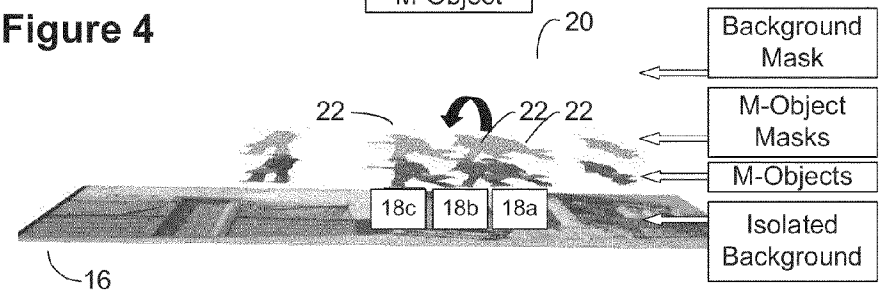



Figure 4

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