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(12) **United States Patent**
Sandrew

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

(56) **References Cited**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(21) Appl. No.: **12/032,969**

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Primary Examiner—Yosef Kassa

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(65) **Prior Publication Data**

(57) **ABSTRACT**

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Related U.S. Application Data

(60) 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.** **382/282**; 382/212; 382/213; 358/517; 358/537

(58) **Field of Classification Search** 382/282, 382/283, 295, 212, 213, 305; 358/517, 537, 358/538, 540

Motion picture scenes to be colorized 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. The gray scale actively determines the mask and corresponding color lookup that is applied in a keying fashion within regions of interest.

See application file for complete search history.

4 Claims, 34 Drawing Sheets

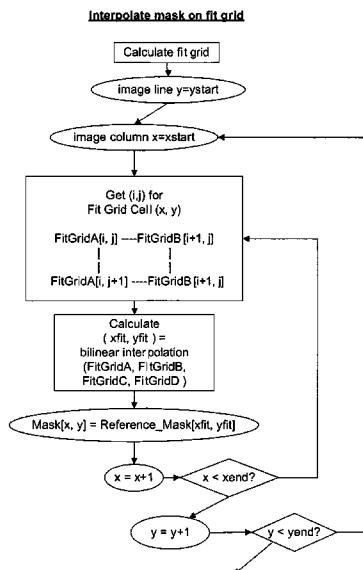


Figure 1

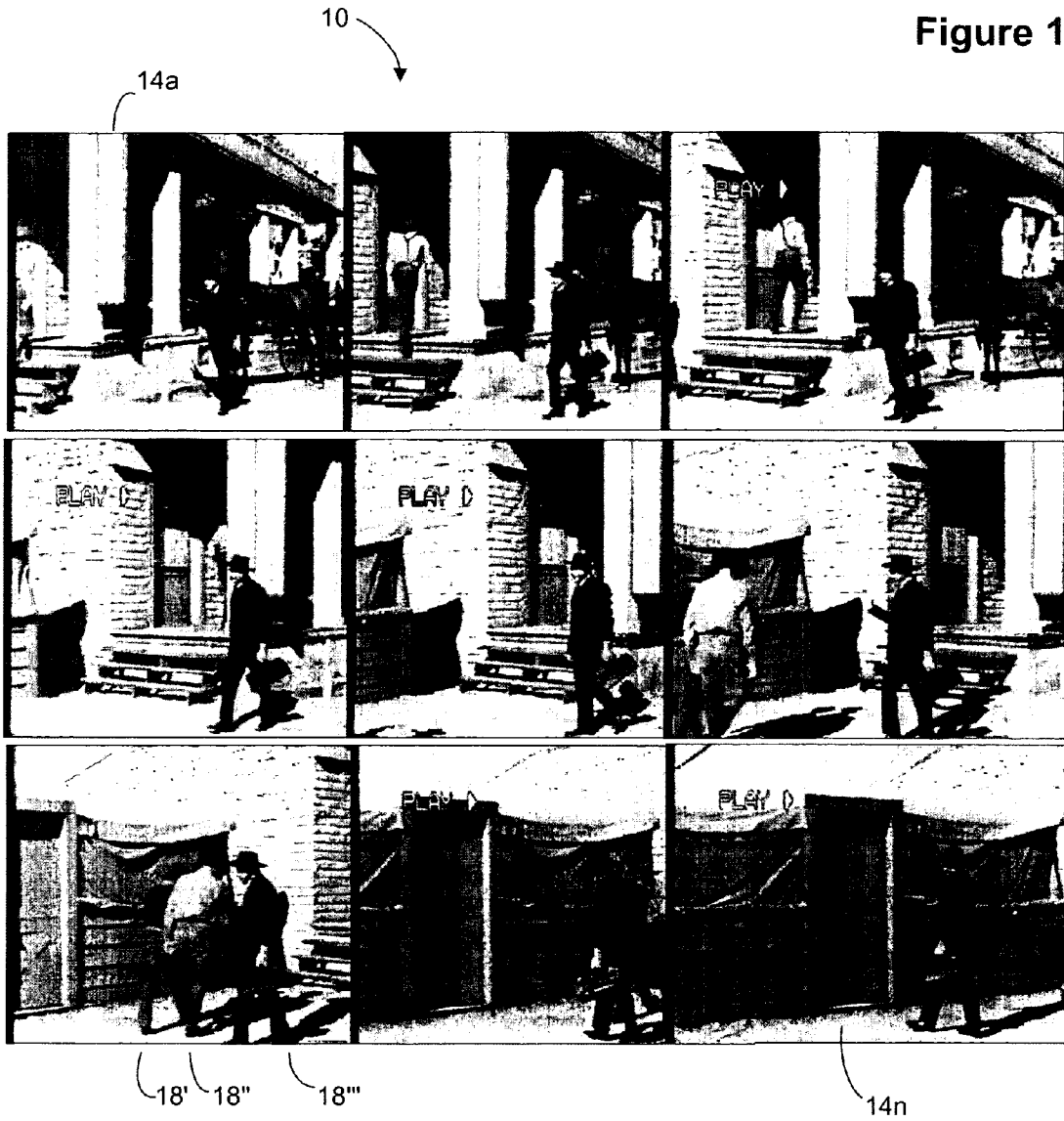


Figure 2

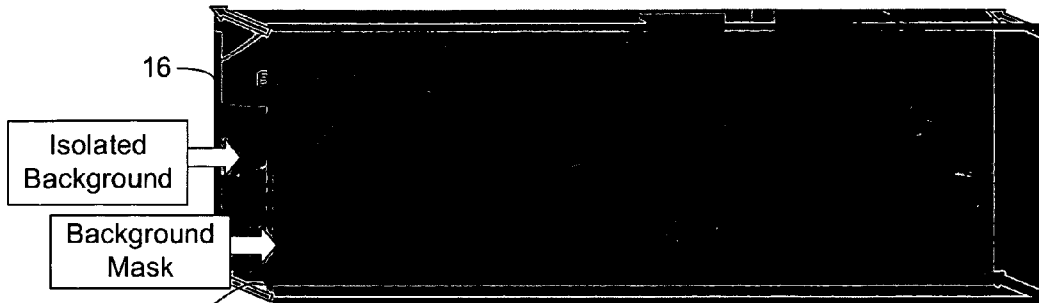


Figure 3

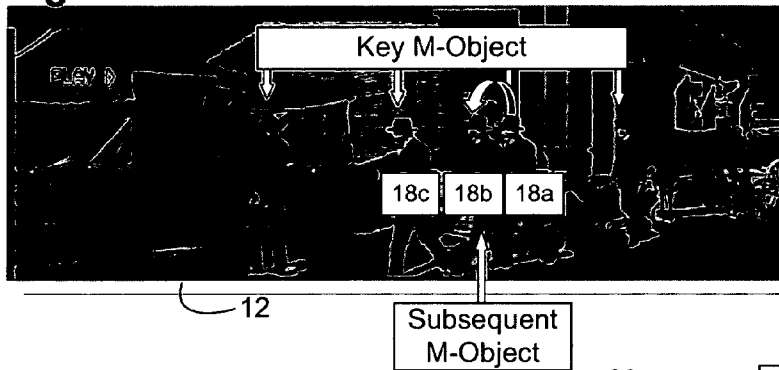


Figure 4

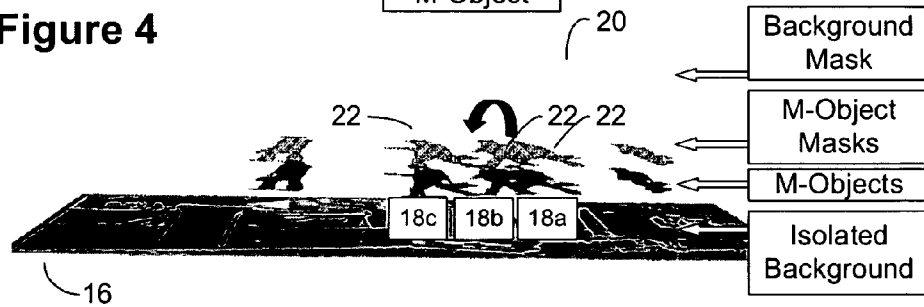


Figure 5A

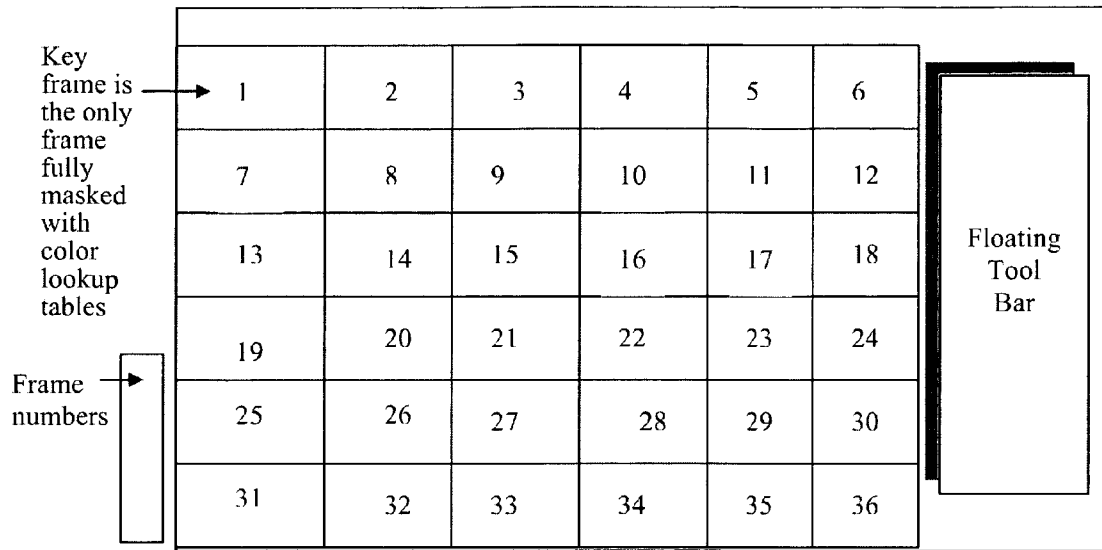
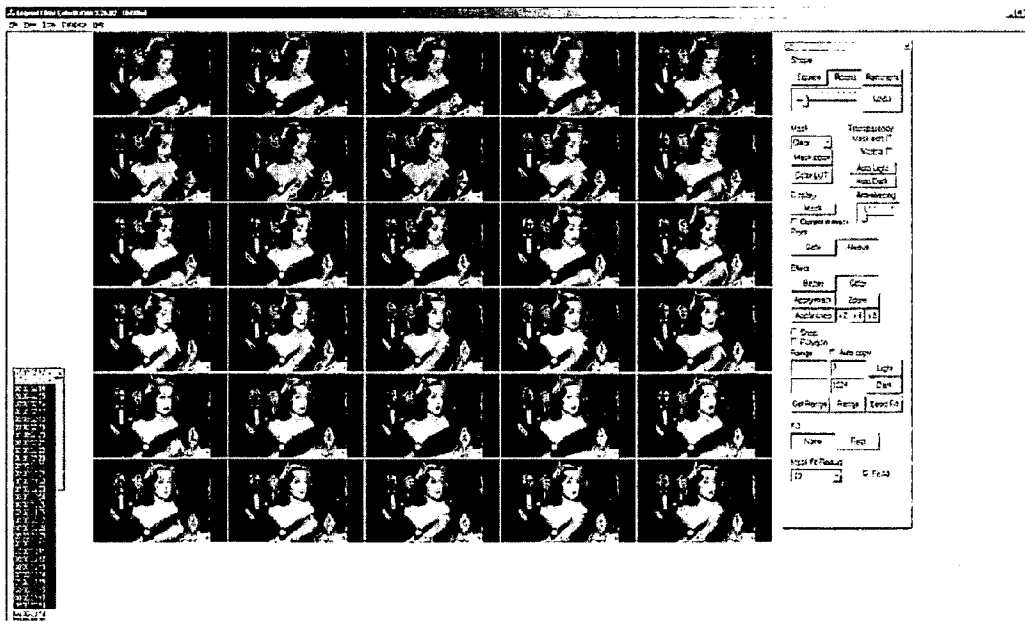
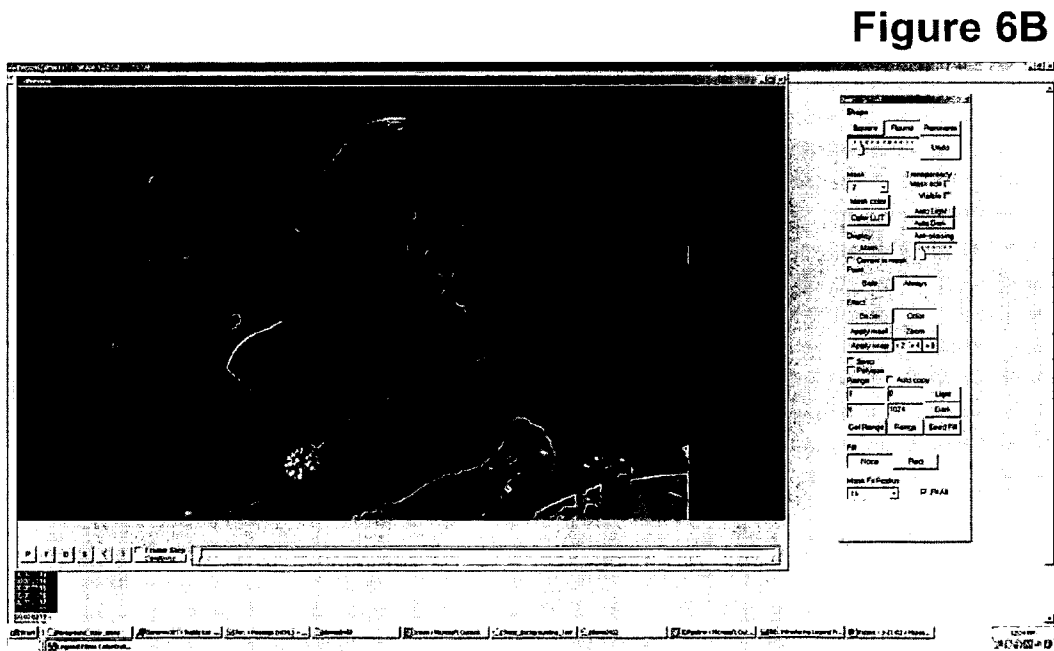
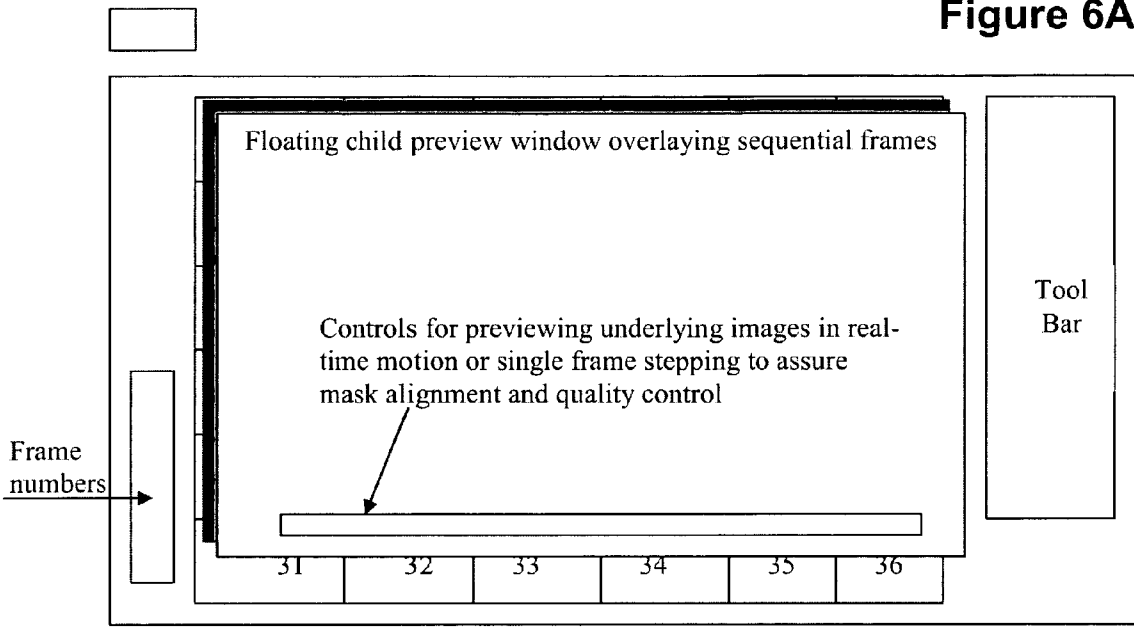


Figure 5B





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