EXHIBIT B

US005999220A

United States Patent [19]

Washino

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[54] **MULTI-FORMAT AUDIO/VIDEO PRODUCTION SYSTEM WITH FRAME-RATE CONVERSION**

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[21] Appl. No.: **08/834,912**

[22] Filed: **Apr. 7, 1997**

[51] **Int. Cl.**[6] **H04N 5/46**; H04N 7/01

[52] **U.S. Cl.** **348/441**; 348/722; 348/445; 348/555; 348/556

[58] **Field of Search** 348/441, 445, 348/448, 426, 432, 454, 558, 568, 555–556, 722, 911, 575; 358/527, 524; H04N 5/46, 7/01, 5/262, 5/253

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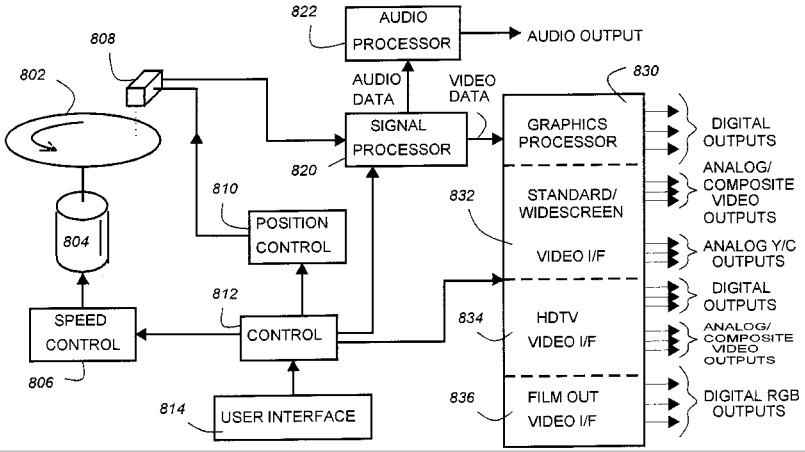
[57] **ABSTRACT**

An audio/video production system facilitates professional quality image manipulation and editing. A program input may be translated into any of a variety of graphics or television formats, including NTSC, PAL, SECAM and HDTV, and stored as data-compressed images, using any of several commercially available methods such as Motion JPEG, MPEG, etc. While being processed, the images may be re-sized to produce a desired aspect ratio or dimensions using conventional techniques such as pixel interpolation, and signals within the video data stream optionally may be utilized to control "pan/scan" operations at a receiving video display unit, in case this unit does not have the same aspect ratio as the source signal. Other information may be utilized to. restrict playback of the program material based on predetermined regional or geographical criteria. Frame rate conversion to and from conventional formats is performed by using the prevailing techniques employed for film-to-NTSC and film-to-PAL transfers, or by inter-frame interpolation, all well known in the art, or by reproduction of the program at a selected non-standard frame rate, optionally combined with these prevailing techniques. By judicious selection of the optimal digitizing parameters, the system allows a user to establish an inter-related family of aspect ratios, resolutions, and frame rates, yet remain compatible with currently available and planned graphics and television formats.

27 Claims, 9 Drawing Sheets



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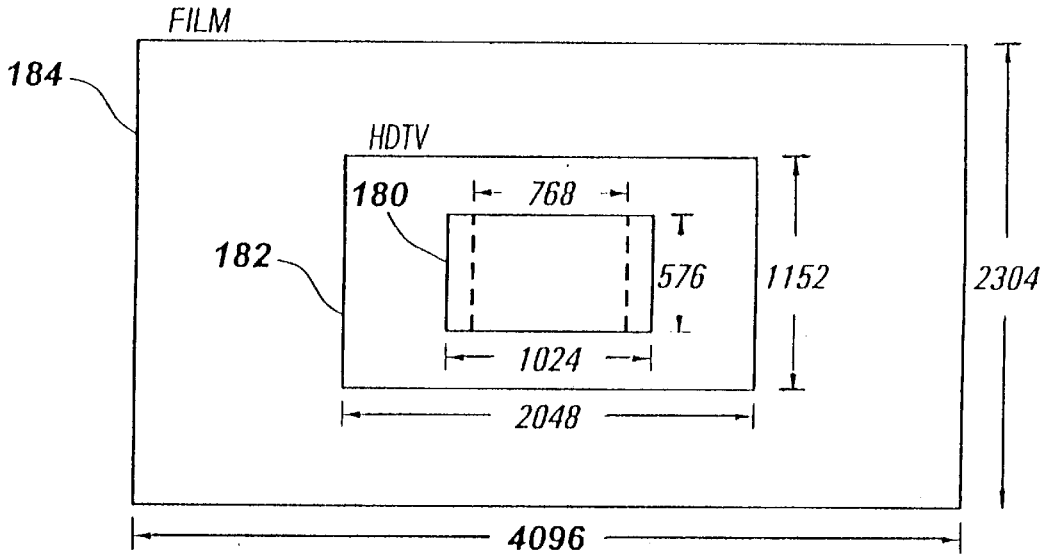

Figure 1a

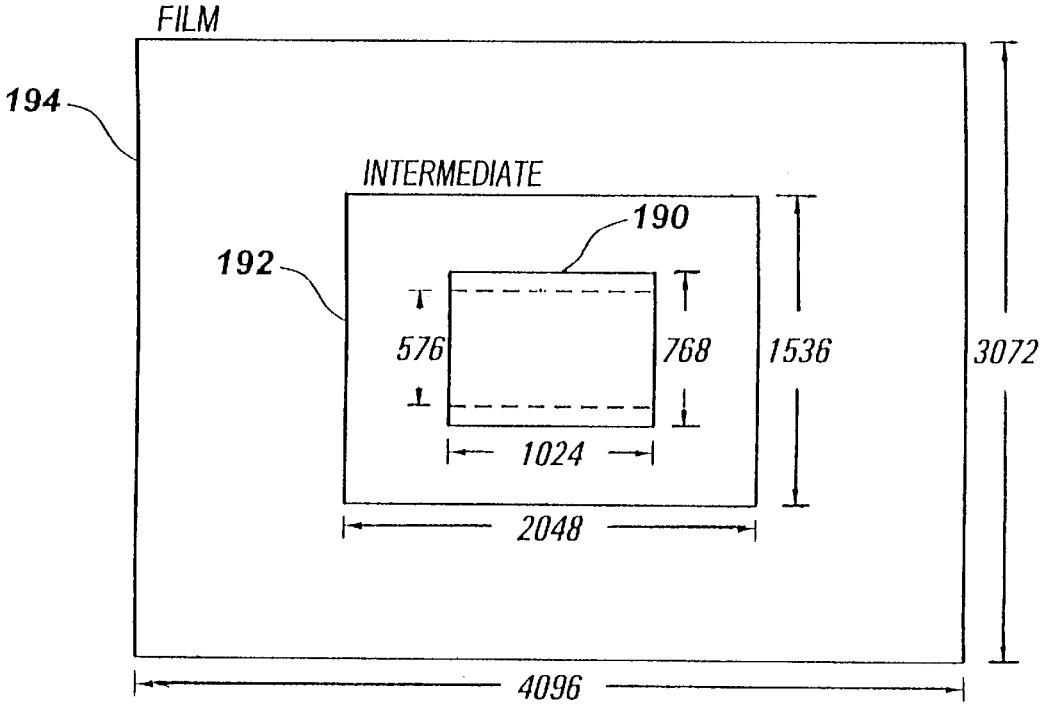

Figure 1b

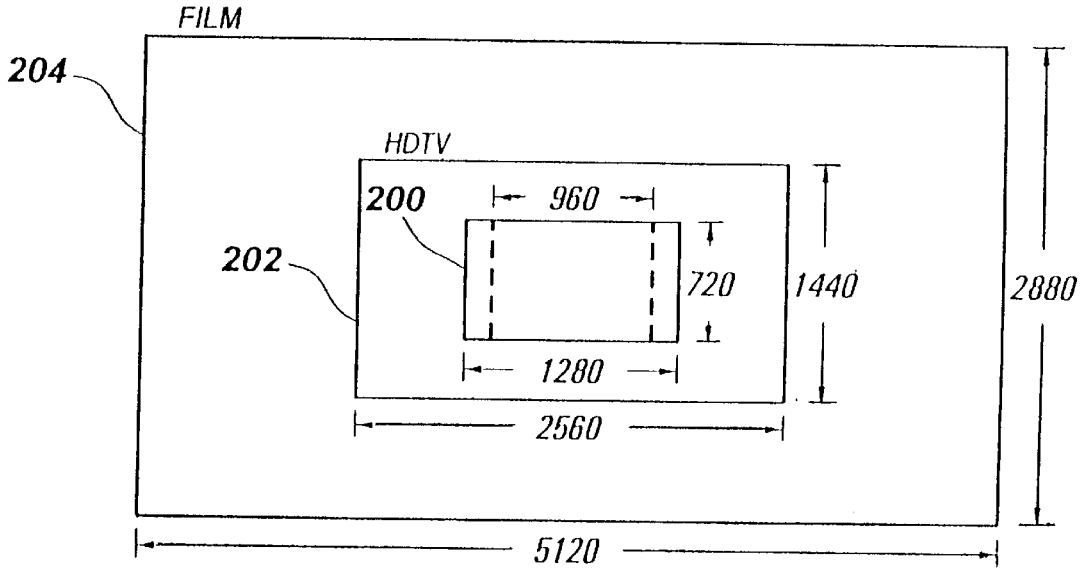

Figure 1c

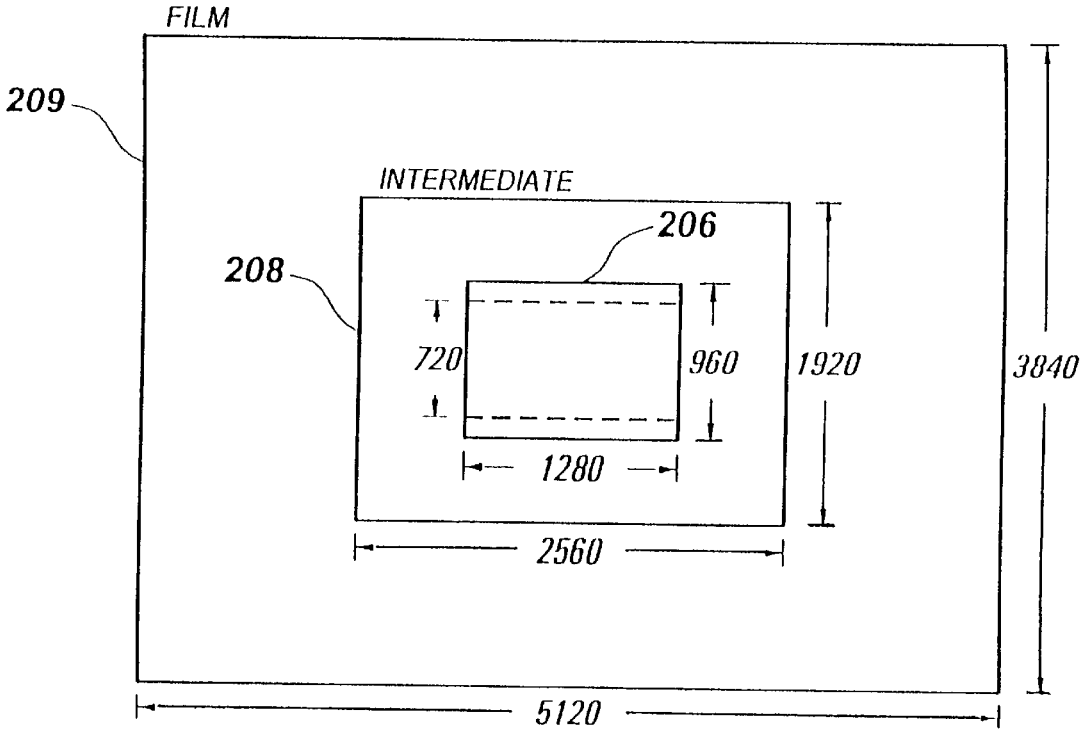

Figure 1d

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