

# United States Patent [19]

Kupnicki et al.

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[54] **TELEVISION TRANSMISSION NETWORK WITH SCRAMBLING AND DESCRAMBLING**

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[21] Appl. No.: **629,180**

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[51] Int. Cl.<sup>4</sup> ..... **H04N 7/167; H04L 9/00**

[52] U.S. Cl. .... **380/14; 380/19; 380/20; 380/37; 380/50**

[58] Field of Search ..... **358/114, 119, 121, 122; 178/22.04, 22.07, 22.05, 22.19; 380/10, 14, 19, 20, 23, 36, 37, 50**

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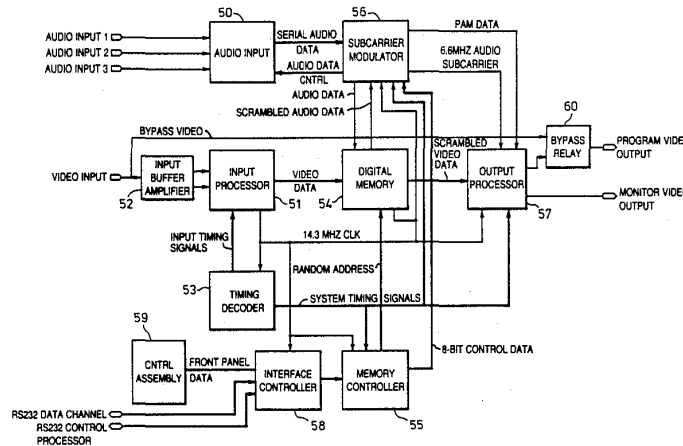
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[57] **ABSTRACT**

A controlled access television communications network in which scrambling and descrambling are accomplished by digital signal processing. At the scrambler, the video and audio information are digitized, segmented for example on a line-by-line basis, and randomly reordered. Decryption data corresponding to the random reordering of the information segments are derived, and inserted into the scrambled video data. A composite signal comprising the video data, audio modulated subcarrier, synchronizing signals and the decryption data is transmitted to the receivers along with dedicated keys whereby descramblers at the receivers are selectively enabled in accordance with the remote selection of authorized users.

**11 Claims, 27 Drawing Sheets**



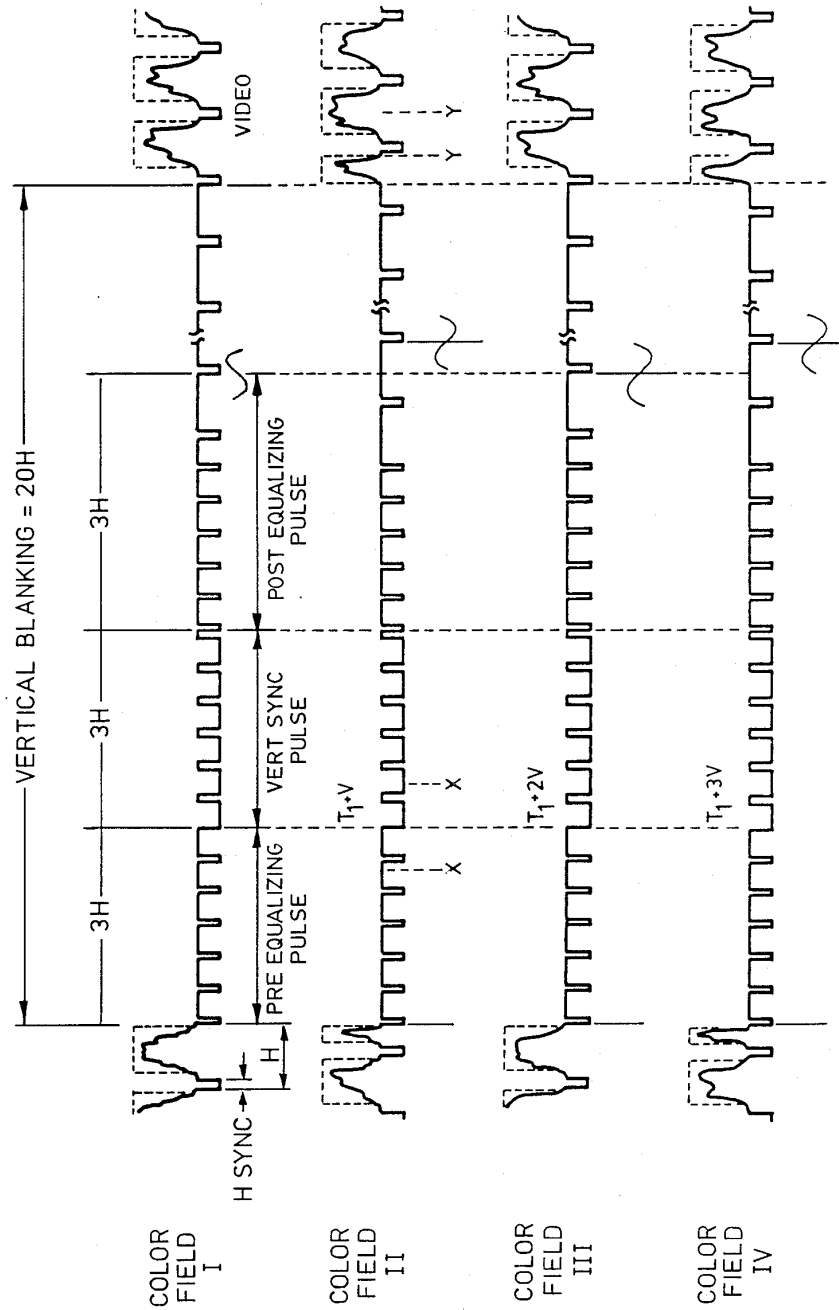


FIG. 1

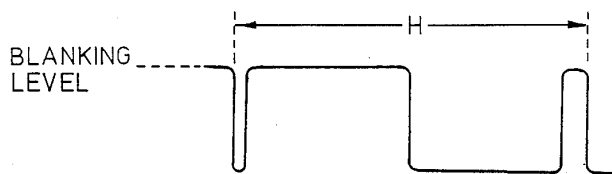


FIG. 2a

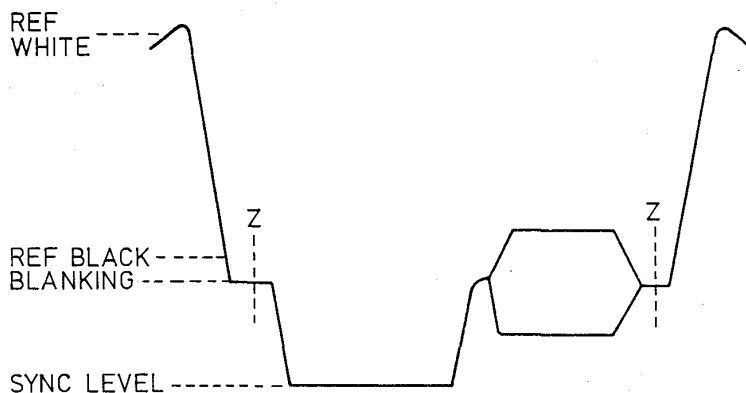


FIG. 2b

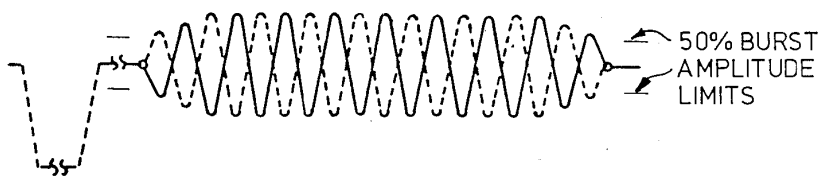


FIG. 2c

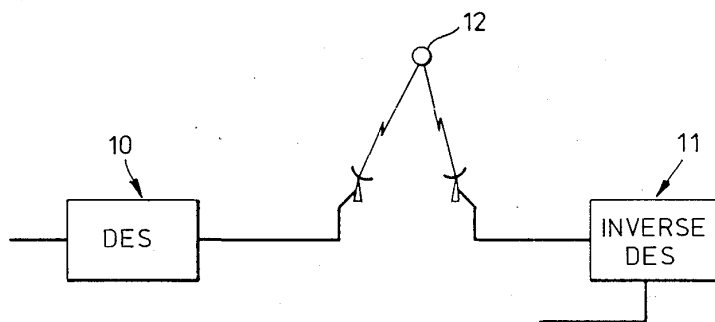


FIG. 3

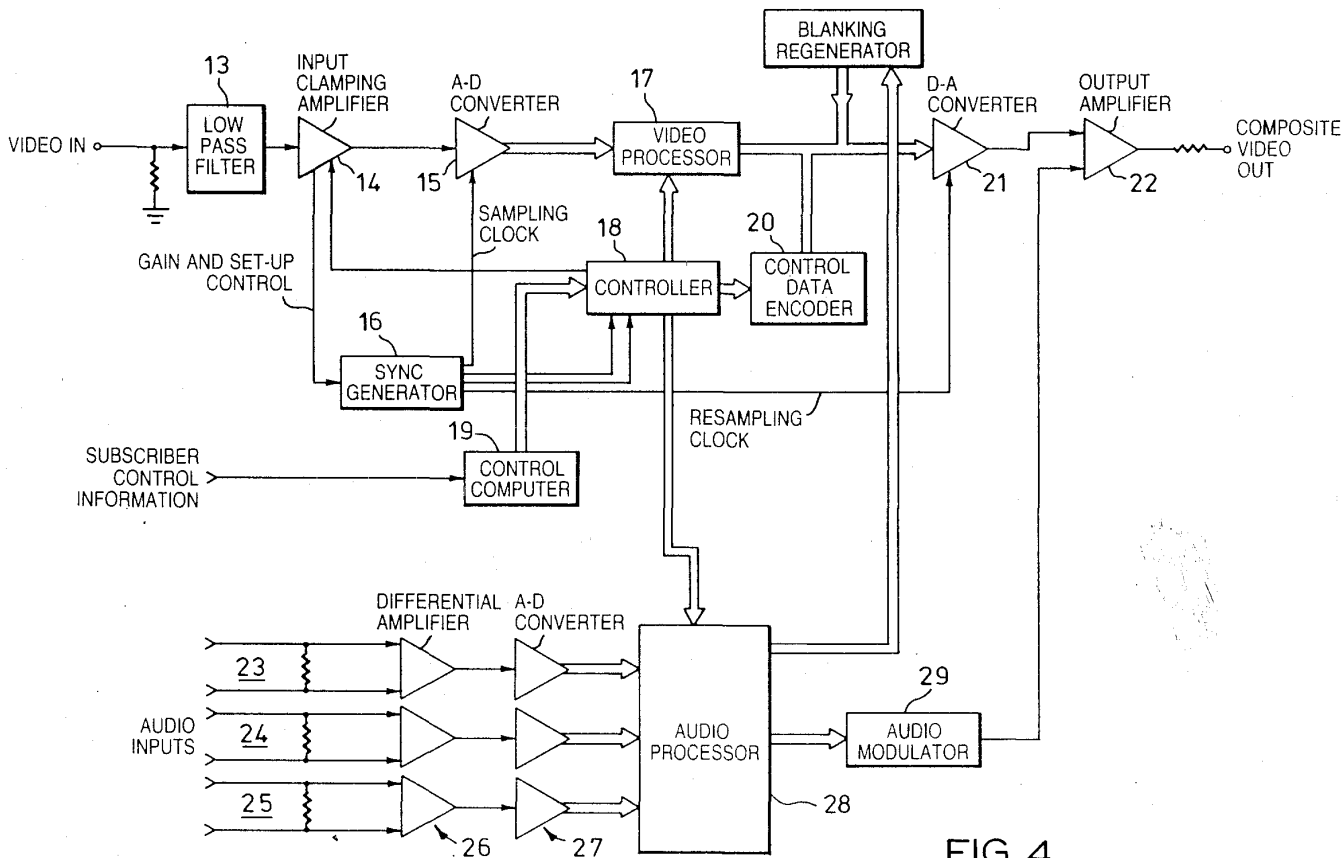


FIG. 4

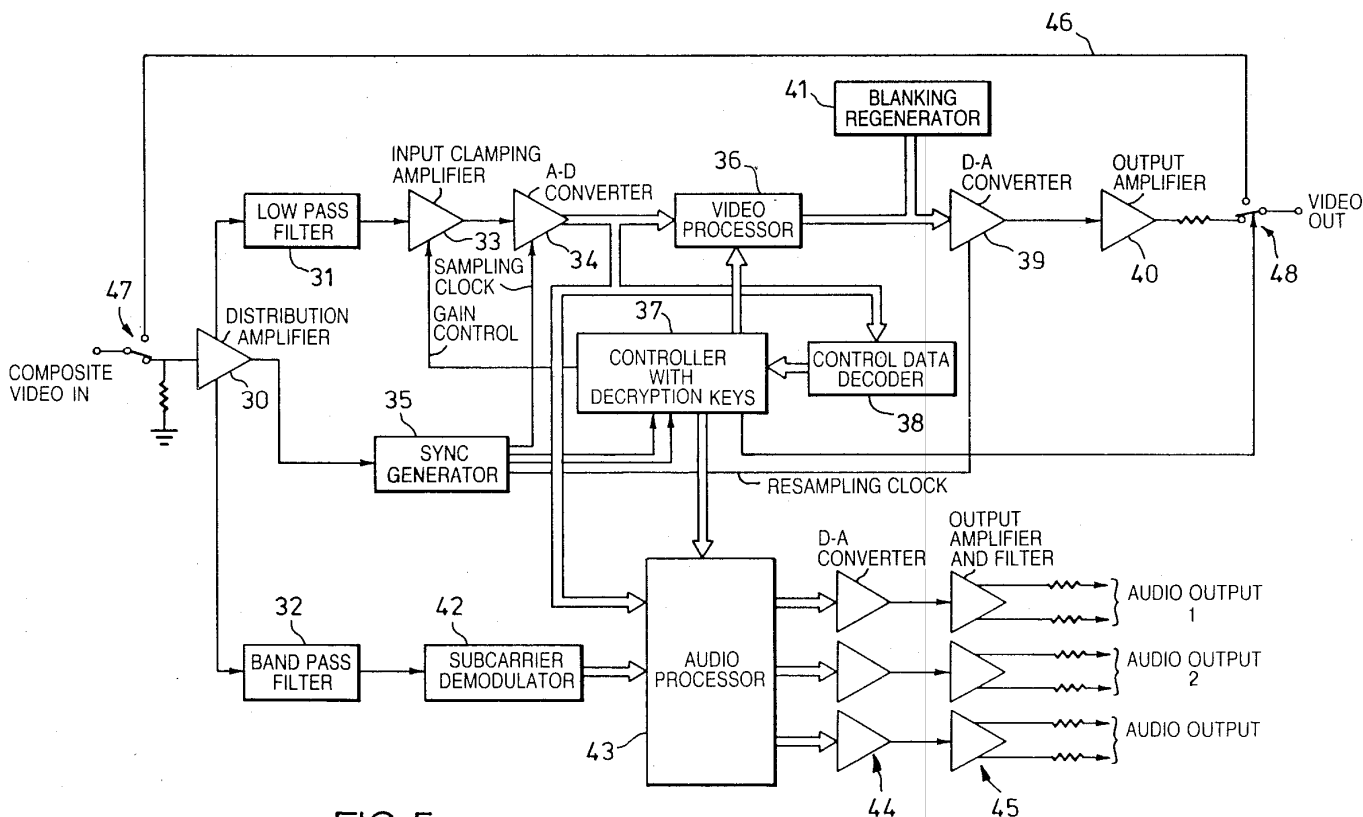


FIG. 5

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