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(54) **METHOD AND APPARATUS FOR CONTINUOUS PLAYBACK OR DISTRIBUTION OF INFORMATION INCLUDING AUDIO-VISUAL STREAMED MULTIMEDIA**

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Related U.S. Application Data

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(51) **Int. Cl.**^{7} **G06F 15/16**

(52) **U.S. Cl.** **709/231**; 709/232; 709/233

(58) **Field of Search** 709/217, 219, 709/218, 231, 232, 233, 234, 235; 348/6, 7, 513, 516, 518; 725/101, 92, 93, 94, 95, 96, 88, 89, 90, 134, 142

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(57)   **ABSTRACT**

An embodiment of the present invention is an apparatus for preparing media for playback which comprises: (a) a buffer which stores data corresponding to the media; (b) a time-scale modification system that time-scale modifies data output from the buffer at a playback rate; and (c) a rate determiner that determines the playback rate over an interval to control the amount of data in the buffer.
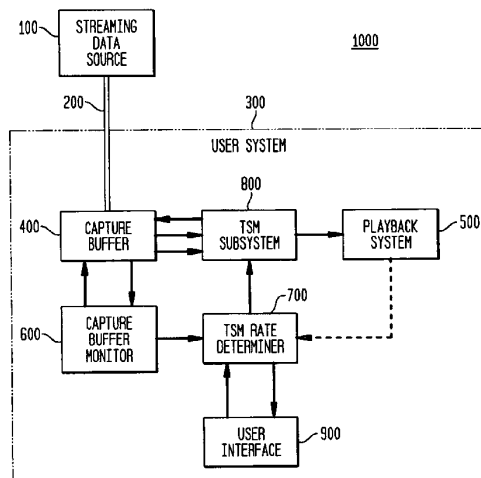
2 Claims, 16 Drawing Sheets

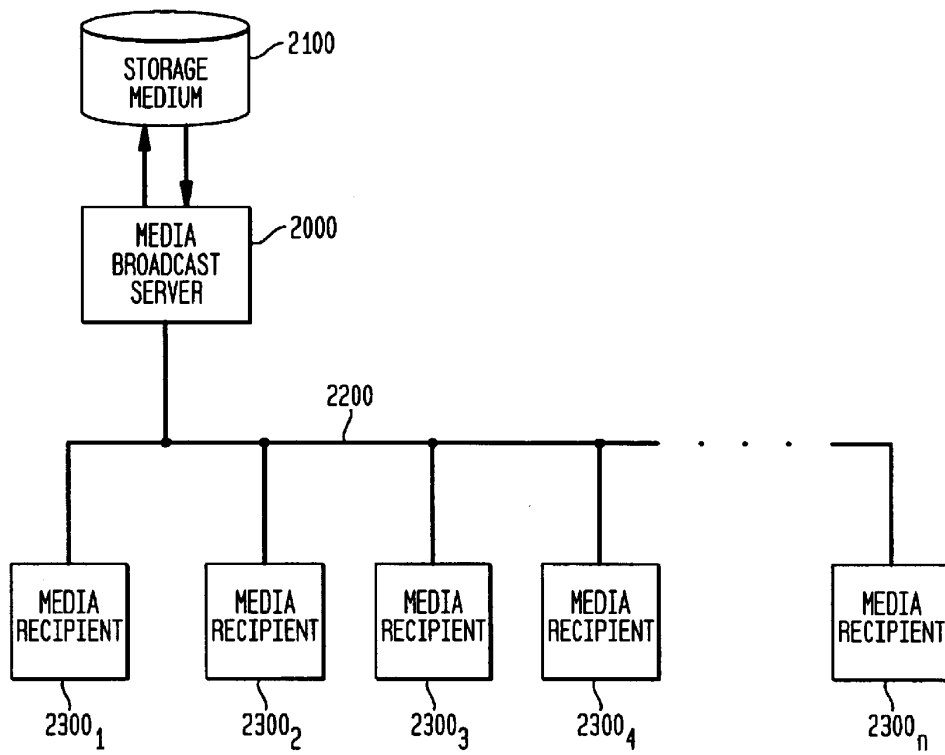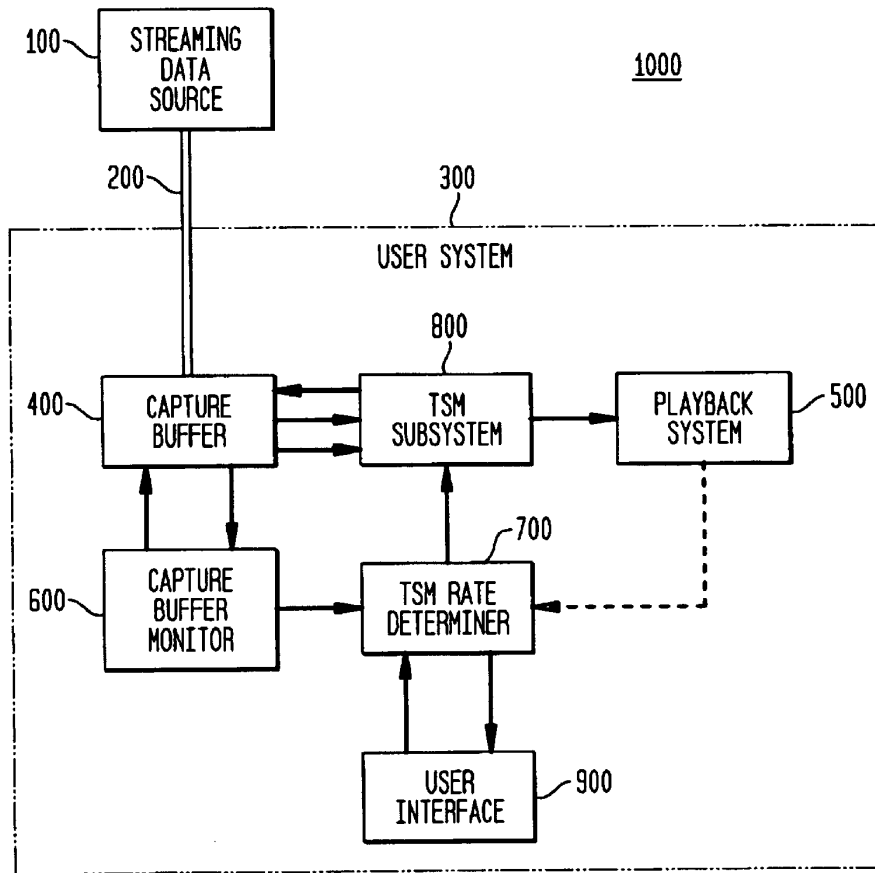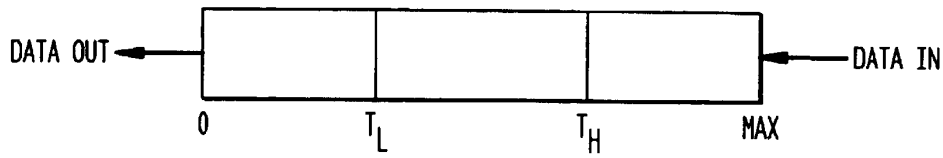*FIG. 1*

FIG. 2

FIG. 3

DATA OUT ◄───── ┌─────┬─────┬─────┐ ◄───── DATA IN
                 └─────┴─────┴─────┘
                 0   T_L T_H MAX

FIG. 4

PLAYBACK RATE

DATA LEVEL

0   T_L T_H MAX
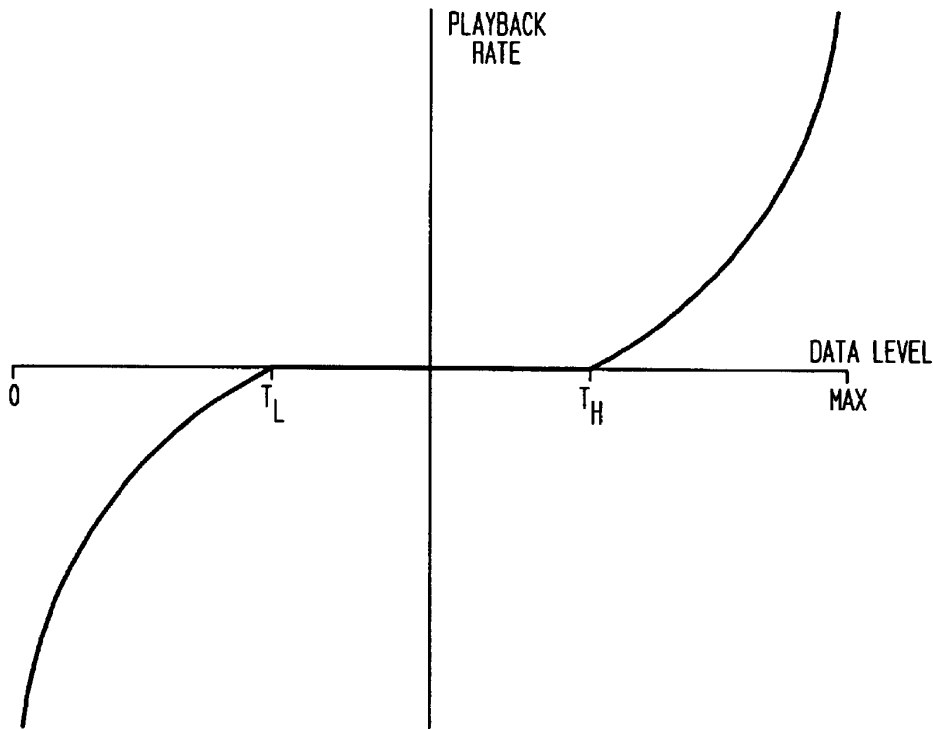
$$0 \leq x \leq T_L \qquad \text{PLAYBACK RATE} = (\text{SCALE}) \tanh^{-1}((X-T_L)/(T_L))$$

$$T_L < x_L < T_H \qquad \text{PLAYBACK RATE} = 1.0$$

$$T_H \leq x \leq \text{MAX} \qquad \text{PLAYBACK RATE} = (\text{SCALE}) \tanh^{-1}((X-T_H)/(\text{MAX}-T_H))$$

FIG. 5

INPUT
TO TSM
SUBSYSTEM

t

OUTPUT
OF TSM
SUBSYSTEM

t

FIG. 6

INPUT
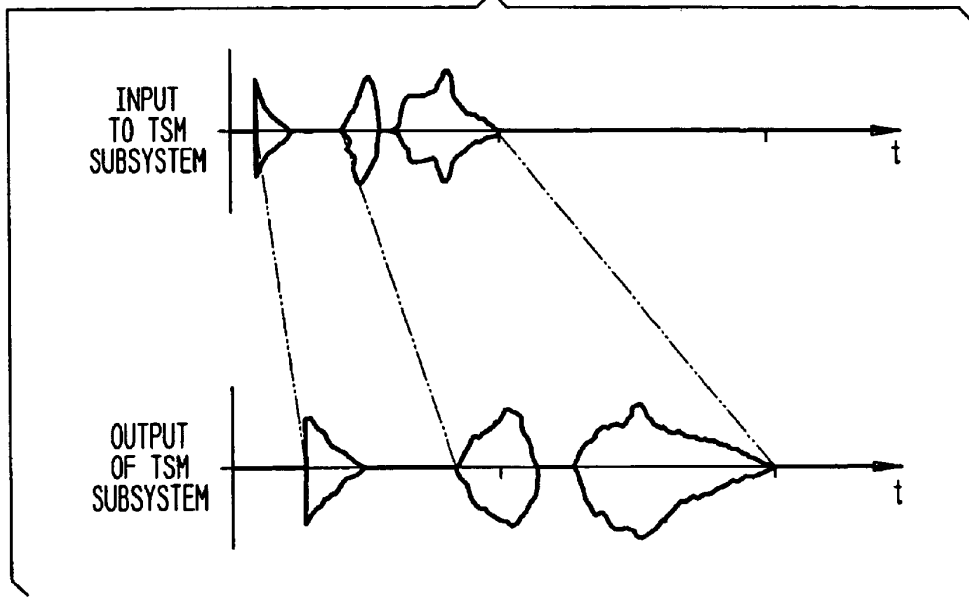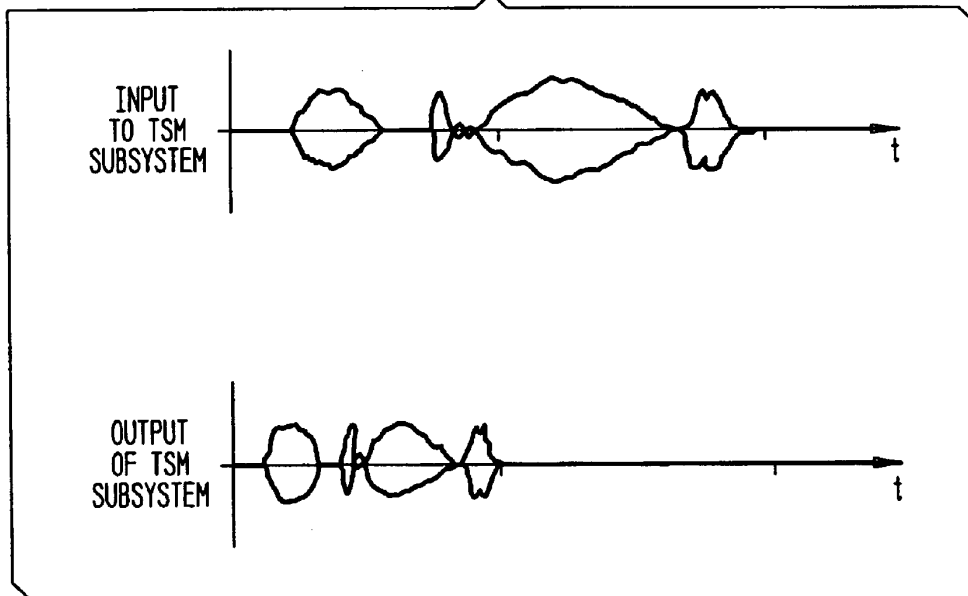TO TSM
SUBSYSTEM

t

OUTPUT
OF TSM
SUBSYSTEM

t

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