United States Patent [19]

Rich et al.

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[54] **INTEGRATED ANALOG-TO-DIGITAL CONVERTER**

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[52] **U.S. Cl.** **341/143**; 341/110; 341/158; 341/126

[58] **Field of Search** 341/126, 143, 158

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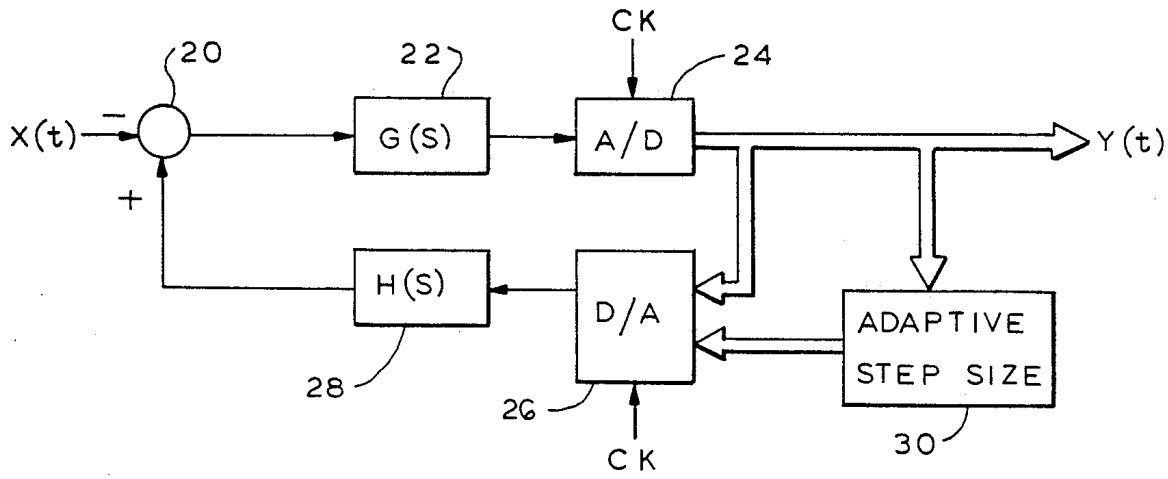
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[57] **ABSTRACT**

A feedback coder, which employs simple CMOS push-/pull amplifiers as gain elements, along with a bistable circuit, in its preferred embodiment takes the form of a second-order delta-sigma modulator. The output of the modulator is converted into pulse code modulated words by a finite impulse response filter which incorporates a partial coefficient generator utilizing simplified logic. The generator output is provided to an accumulator in which the stages operate at reduced speed. A simple multiplexer generates a serial output. The entire converter can be integrated on a semiconductor chip of relatively small area.

33 Claims, 17 Drawing Sheets



N-BIT FEEDBACK CODER