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## United States Patent [19]

[11]

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Moorer

[45]

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[54] MUSICAL INSTRUMENT AND METHOD  
FOR GENERATING MUSICAL SOUND

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84/1.24[58] Field of Search ..... 84/1.11, 1.03, 1.01,  
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## [56] References Cited

## U.S. PATENT DOCUMENTS

4,003,003	1/1977	Haeberlin	.....	84/1.01
4,018,121	4/1977	Chowning	.....	84/1.01

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## [57] ABSTRACT

Disclosed is a musical instrument and method for generating musical sound. Digital circuits produce a sequence of numbers which are converted to analog electrical signals which are periodically sampled to drive a conventional speaker. The digital circuits operate in accordance with a method of forming each sample by evaluation of a closed-form expression including a first function of time, either periodic or non-periodic, transformed by a second function of time where the second function is non-linear, non-sinusoidal and differs from the first function. The frequency spectra of the resulting musical sound can be finite and the amplitudes of frequency components do not have unwanted limitations.

16 Claims, 14 Drawing Figures

