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**Lindemann**

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(54) **MUSICAL SYNTHESIZER CAPABLE OF EXPRESSIVE PHRASING**

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\* cited by examiner

(75) Inventor: **Eric Lindemann**, 2975 18th St.,  
Boulder, CO (US) 80304

*Primary Examiner*—Marlon T. Fletcher

(73) Assignee: **Eric Lindemann**, Boulder, CO (US)

(57) **ABSTRACT**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

The present invention describes a device and methods for synthesizing a musical audio signal. The invention includes a device for storing a collection of sound segments taken from idiomatic musical performances. Some of these sound segments include transitions between musical notes such as the slur from the end of one note to the beginning of the next. Much of the complexity and expressivity in musical phrasing is associated with the complex behavior of these transition segments. The invention further includes a device for generating a sequence of sound segments in response to an input control sequence—e.g. a MIDI sequence. The sound segments are associated with musical gesture types. The gesture types include attack, release, transition, and sustain. The sound segments are further associated with musical gesture subtypes. Large upward slur, small upward slur, large downward slur, and small downward slur are examples of subtypes of the transition gesture type. Event patterns in the input control sequence lead to the generation of a sequence of musical gesture types and subtypes, which in turn leads to the selection of a sequence of sound segments. The sound segments are combined to form an audio signal and played out by a sound segment player. The sound segment player pitch-shifts and intensity-shifts the sound segments in response to the input control sequence.

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(52) **U.S. Cl.** ..... **84/609**; 84/601; 84/602;  
84/622; 84/649; 84/659

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**53 Claims, 9 Drawing Sheets**

