United States Patent [19]

Lampotang et al.

[54] **APPARATUS AND METHOD OF STIMULATING BREATHING SOUNDS**

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[57]   **ABSTRACT**

An apparatus and method of simulating breathing sounds in real time involves the use of a manikin having a lung bellows. A sensor associated with the lung bellows is used to continuously determine the volume such that, using standard mathematical procedures based on the time and volume determined, a first derivative of the bellows volume over time can be calculated to determine the phase of the respiratory cycle (e.g. inhalation or exhalation). In addition, by calculating a second derivative of the bellows volume over time, a transition in phase of the respiratory cycle can be determined. Based upon the first and second derivatives of the bellows volume over time, a sound is output through an output device, such as a speaker, located proximate the mouth of the manikin. The outputted sounds are pre-recorded audible sounds of breathing corresponding to appropriate physiological sounds.

4 Claims, 7 Drawing Sheets