display during testing could allow the user to witness metabolic changes due to changes in their activity level, relaxation level, or for other reasons. For example, the calorimeter and the display, or other feedback device, could be used a biofeedback system for helping people to reach certain levels of relaxation. Breathing therapy and training could also be administered using the calorimeter to monitor breathing rate, volume, and other factors.

As yet another alternative, an artificial "nose" may be provided for use with or as part of the calorimeter. An artificial "nose" conditions the inhalations and/or exhalations so as to control humidity or temperature. This may be advantageous for some applications.

What is claimed is:

1. An indirect calorimeter for measuring the metabolic rate of a subject, said calorimeter comprising:

a respiratory connector configured to be supported in contact with the subject so as to pass inhaled and exhaled gases as the subject breathes;

a flow pathway operable to receive and pass inhaled and exhaled gases, said flow pathway having a first end in fluid communication with said respiratory connector and a second end in fluid communication with a source and sink for respiratory gases, said flow pathway comprising a flow tube through which the inhaled and exhaled gases pass, and an outer housing surrounding said flow tube, and a chamber disposed between said flow tube and said first end, said chamber being a concentric chamber surrounding one end of said flow tube and being defined between said flow tube and said outer housing;

a flow meter configured to generate electrical signals as a function of the instantaneous flow volume of inhaled and exhaled gases passing through said flow pathway;

a component gas concentration sensor operable to generate electrical signals as a function of the instantaneous fraction of a predetermined component gas in the exhaled gases as the gases pass through said flow pathway; and

a computation unit operable to receive said electrical signals from said flow meter and said concentration sensor and operative to calculate at least one respiratory parameter for the subject as the subject breathes through the calorimeter.

2. The calorimeter according to claim **1**, wherein said first end of flow pathway comprises an inlet conduit extending from said outer housing and in fluid communication with said concentric chamber.

3. An indirect calorimeter for measuring the metabolic rate of a subject, said calorimeter comprising:

a respiratory connector configured to be supported in contact with the subject so as to pass inhaled and exhaled gases as the subject breathes;

a flow pathway operable to receive and pass inhaled and exhaled gases, said flow pathway having a first end in fluid communication with the respiratory connector, a second end in fluid communication with a source and sink for respiratory gases, a flow tube disposed therebetween, and an outer housing surrounding said flow tube and defining a concentric chamber between the flow tube and said outer housing, said concentric chamber being in fluid communication with said flow tube, said first end of said flow pathway comprising an inlet conduit extending perpendicular to said flow tube, said inlet conduit extending from said outer housing and being in fluid communication with said concentric chamber;

a flow meter configured to generate electrical signals as a function of the instantaneous flow volume of inhaled and exhaled gases passing through said flow pathway;

a component gas concentration sensor operable to generate electrical signals as a function of the instantaneous fraction of a predetermined component gas in the exhaled gases as the gases pass through said flow pathway; and

a computation unit operable to receive said electrical signals from said flow meter and said concentration sensor and operative to calculate at least one respiratory parameter for the subject as the subject breathes through the calorimeter.

4. An indirect calorimeter for measuring the metabolic rate of a subject, said calorimeter comprising:

a respiratory connector configured to be supported in contact with the subject so as to pass inhaled and exhaled gases as the subject breathes;

a flow pathway operable to receive and pass inhaled and exhaled gases, said flow pathway having a first end in fluid communication with said respiratory connector and a second end in fluid communication with a source and sink for respiratory gases, said flow pathway including an elongated flow tube through which the gases pass and further comprising an outer housing surrounding said flow tube and a concentric chamber defined between said flow tube and said outer housing, said concentric chamber being in fluid communication with said first end of said flow pathway and said flow tube;

an ultrasonic flow meter configured to generate electrical signals as a function of the instantaneous flow volume of inhaled and exhaled gases passing through said tube, said flow meter comprising a pair of spaced apart ultrasonic transducers each aligned with said elongated flow tube such that ultrasonic pulses transmitted between said transducers travel in a path generally parallel to the flow of fluid in said flow tube;

a component gas concentration sensor operable to generate electrical signals as a function of the instantaneous fraction of a predetermined component gas in the exhaled gases as the gases pass through said flow pathway; and

a computation unit operable to receive said electrical signals from said flow meter and said concentration sensor and operative to calculate at least one respiratory parameter for the subject as the subject breathes through the calorimeter.

5. The calorimeter according to claim **4**, wherein said first end of flow pathway comprises an inlet conduit extending from said outer housing and in fluid communication with said concentric chamber.

6. The calorimeter according to claim **5**, wherein said inlet conduit extends generally perpendicular to said flow tube.

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