SFU SIMON FRASER UNIVERSITY

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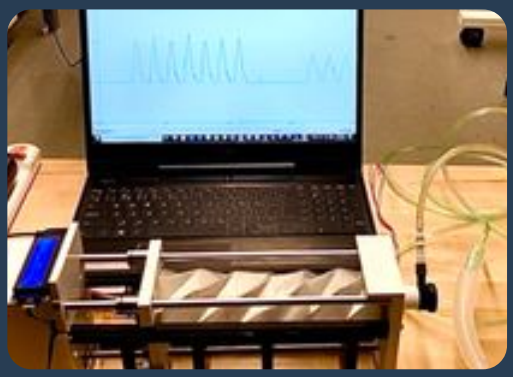
Ventilator and Airbag for a Ventilator

An ultra-portable ventilator solution, which provides higher efficiency of air transfer based on unique geometry

Request an introduction



Reference: 2020-003-01

Header image provided by the university

IP Status

Patent application submitted, Provisional patent

Seeking

Seeking investment, University spin out, Commercial partner, Development partner

Background

Partly because of their high cost, traditional ventilators are typically reserved for hospital intensive care units (ICUs) and are rarely deployed outside of such settings. Further still, the airbags of existing ventilators can prematurely break down from extended usage as a result of the repeated compression cycles applied to the airbag.

There is therefore an ongoing need for improved ventilators and airbags for ventilators in the cases such as transportation of patients, spinal cord injured patients, or remote care settings.

Tech Overview

The 3D printed ventilator uses a designed airbag with a pattern of linear creases or fold lines formed thereon. The fold line pattern may enable the airbag to more efficiently distribute mechanical stresses during compression cycles while helping to minimize the overall stress that is applied to the airbag.

The fold line pattern may comprise any one or more of multiple different types of origami-based or non-origami-based patterns, such as a Kresling pattern, a Yoshimura pattern, or a Tachi-Miura pattern. The airbag may be cost-effectively produced through three-dimensional (3D) printing, and may be of a tunable and sufficiently small size that, when incorporated with other components of the ventilator, may result in a ventilator that is easily portable with total weight ranges between 3 and 6 kilograms including breathing circuits.

The ventilator, and in particular the airbag having different parameters such as different volumes or different elastic moduli, may be rapidly and easily produced. This may enable a suitable airbag to be more efficiently deployed, depending on the needs of the particular patient.

Benefits

- Rapid deployment of ventilator based on ultra-portable design.
- Minimizes mechanical stress by the individual fold line pattern enabling the airbag to more efficiently fold and unfold during compression cycles while helping to minimize the overall stress that is applied to the airbag.
- 3D printed airbag with 3D printed electrodes can have significant engineering design freedom for tuning its performance.
- Cost-efficiency and production efficiency via 3D printing for manufacturing.

Patents

- IP Filed: Provisional Patent Application filed

Learn more about this opportunity

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