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Groundbreaking Self-Breathing Ventilator Investigation HAYLEY YUKIHIRO, WAYNE STRASSER, BRIAN WALSH, Liberty University — With the rise in global devastation created by the COVID-19 pandemic, the world needs a cheap, simple, and disposable ventilator containing no moving parts. We computationally explore the intricacies of the world's smallest ventilator, the **HOPE inVent**. When connected to a modest motive gas source, this 3-D printed device will self-pulse and ventilate an unconscious patient or support the breathing of a conscious patient. Pulsations occur because of the well-known Coanda effect coupled with acoustic interactions and turbulent instabilities at various scales. Its efficacy is demonstrated, and the influence of several important geometric parameters is revealed.

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