



Dual Pressure, Respiratory Assistance Device

Product: Dual Pressure,
Respiratory Assistance Device

Development Stage:
Prototype Completed

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Presently, there is a large and ongoing requirement for respiratory devices to recruit and stabilize the alveoli (air sacs) in the undeveloped lungs of premature babies. If left untreated, premature babies

have a high risk of developing Respiratory Disease Syndrome, which can progress to chronic lung disease; or worse, it can be fatal.

Continuous Positive Airway Pressure (CPAP) therapy can be used for babies with limited Respiratory Distress. However, babies with moderate-severe respiratory distress require additional, dual level pressure therapy. For example in Nasal Intermittent Positive Pressure Ventilation (NIPPV) therapy, a steady baseline with intermittent peaks is delivered to recruit and stabilize additional alveoli.

A major problem for less developed regions of the world is the high price of NIPPV devices and their requirement for a constant electrical supply. A NIPPV-type device that is low cost and works without a continuous supply of electricity is desperately needed in these regions of the world.

Technology Description

Dr. Gustafson's laboratory has developed a NIPPV device that is simple and reliable to use, inexpensive to manufacture, and requires no electricity to function. This device fulfills an

unmet need in that it is very affordable and easily employed by hospitals and clinics with limited resources and/or in areas without a reliable electrical supply.

This novel device can use an existing bubble CPAP air supply and patient interface, converting it into a "bubble NIPPV" device by replacing the exhaust pipe in the bubble CPAP, with an innovative pressure/relief valve mechanism that creates NIPPV. Energy from the pressurized air is utilized to power oscillation between the bi-level pressures, forgoing the need for electrical power. Adjustment of the bi-level air pressures is similar to controlling the pressure level for bubble CPAP.

Health care facilities can expand their noninvasive respiratory treatment options by simply and inexpensively deploying the "bubble NIPPV" device as a stand-alone system, or they can replace one component of their bubble CPAP mechanism to create a "bubble NIPPV" device.

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Potential Benefits

- Inexpensive to manufacture
- Requires no electrical supply, only pressurized air
- Simple and inexpensive to deploy
- Reliable and inexpensive to maintain
- Easy to adjust to different bi-level pressures
- Upgrades current bubble CPAP machines