Oxygen Hose Reel Design Project

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The Need
Many people have conditions that require daily oxygen therapy in their homes. Many of these patients spend several hours of their day connected to an oxygen concentrator via an oxygen hose. Having this hose run throughout the house can be dangerous to the individual. The scattered hose on the ground can be a tripping hazard, get caught on obstacles in the house, or be crushed, blocking oxygen flow to the patient.

Our Solution
The device shown in the Figure below, offers remedies for all the listed problems that oxygen dependent individuals face. The device allows for the oxygen hose to be stored neatly while allowing the appropriate amount of hose to be distributed or retracted. Incorporated in the design is a wireless remote control, anti-kinking device, and capacity of up to one hundred feet of hose. The reel was designed to be user friendly and have minimal impact on the user’s daily routine.

Figure: The Oxygen Hose Reel (Center), An example of the problem faced by oxygen dependent people (Top Left), The first complete design of the oxygen hose reel (Top Right), The anti-kinking device (Bottom Left), The electronics of the Oxygen Hose Reel (Bottom Right)

Current Status
This project has been a focus of our team for the last 3 years. Our first and most current designs have been manufactured and are shown in the figure above. Our current design has come a long way from the original and features many changes to improve the usability and satisfaction of the customer. The first design was intended to be worn by the user, now the device is stand-alone with a wireless remote. An anti-kinking device was also added internally to keep the hose laid neatly on the reel and minimize the chance of a kink blocking oxygen flow through the hose. Originally, 3D printing was used for prototyping. The new device is made of clear Lexan for demonstration purposes but would ultimately be made of a formed polymer.

Conclusion
We believe we have designed a product that could help solve some inconvenient and dangerous problems faced by oxygen dependent individuals. A lot of thought was put into the needs and wants of those individuals. The oxygen hose reel represents years of dedication from our team and those who have helped us along the way, more importantly it represents fulfillment as engineering students, to design something with purpose.

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