



**Product Abstract**

The Ellipti-Aid is a human lift and support mechanism to be used with an elliptical trainer. It is designed to be useful in a variety of rehabilitative applications and aid in the research of the UF NCR Group. The full assembly consists of a telescoping frame mounted on self-locking wheels, a modular support mechanism driven by electric motors, and a user interface.

**Product Functionality**

Ellipti-Aid consists of a system of motors and pulleys, capable of fully unloading a user and varying the desired unloading. One motor, the winch, is responsible for the main unloading and lifting of the user. A motorized tensioner maintains the unloading as the user moves. Closed-loop feedback control optimizes the unloading based on the user's gait patterns. Users are safely and comfortably held in a 3 point harness. Easy transportation is facilitated by 4 caster wheels and a telescoping frame. Users are first lifted from a seated position to a standing one. Then the Ellipti-Aid is rolled over the elliptical.

**Frame**

The frame consists of a base with a single column where the lifting mechanism is mounted. Alongside the column are handrails designed to be used by the patient if necessary. They also have support points for the harness. The base and lifting arm telescope to ease in transportation and reduce the space occupied when stored



Fig 2. Frame

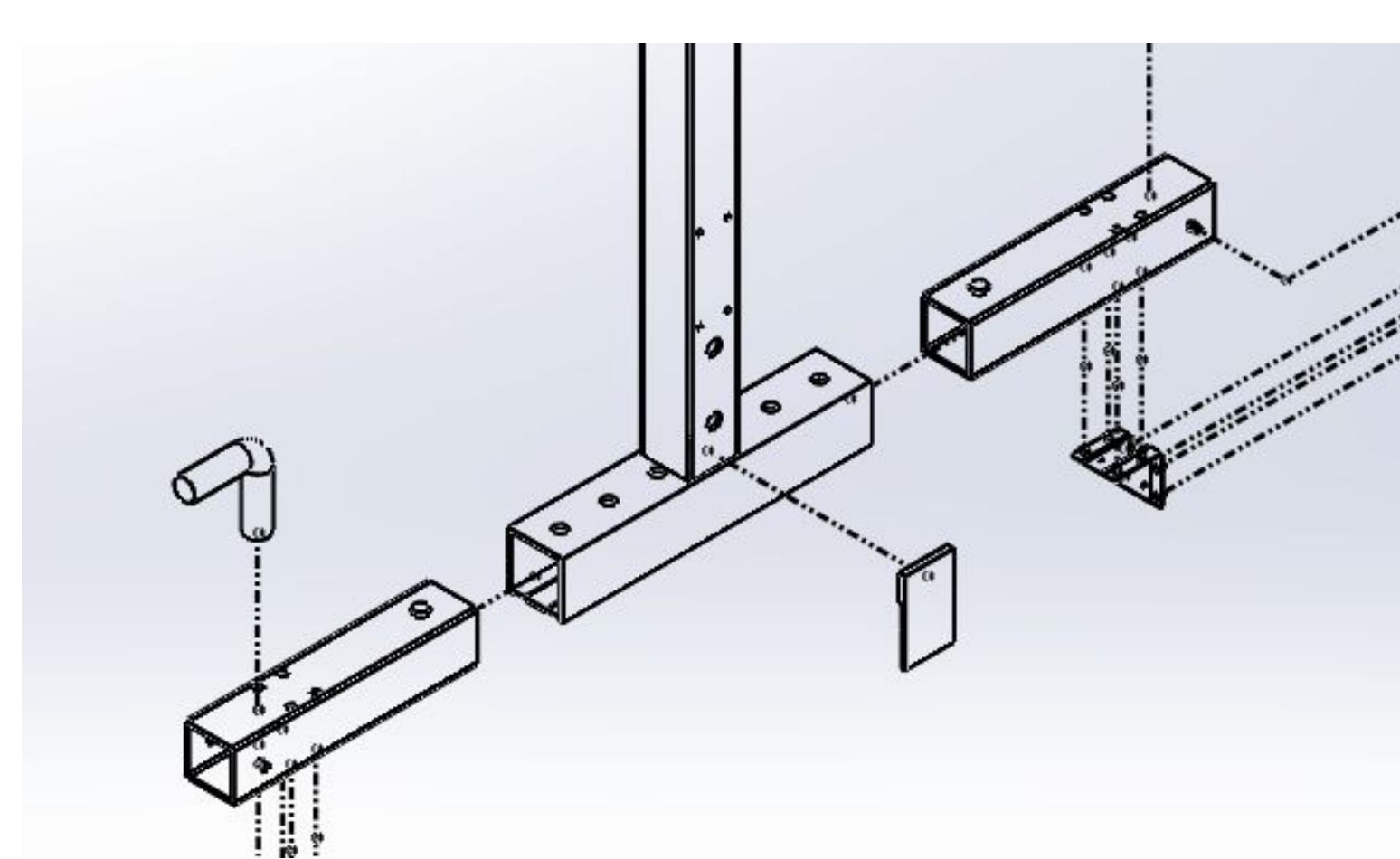


Fig 3. Exploded Frame



Fig 1. Full Rendering

**Lifting Mechanism**

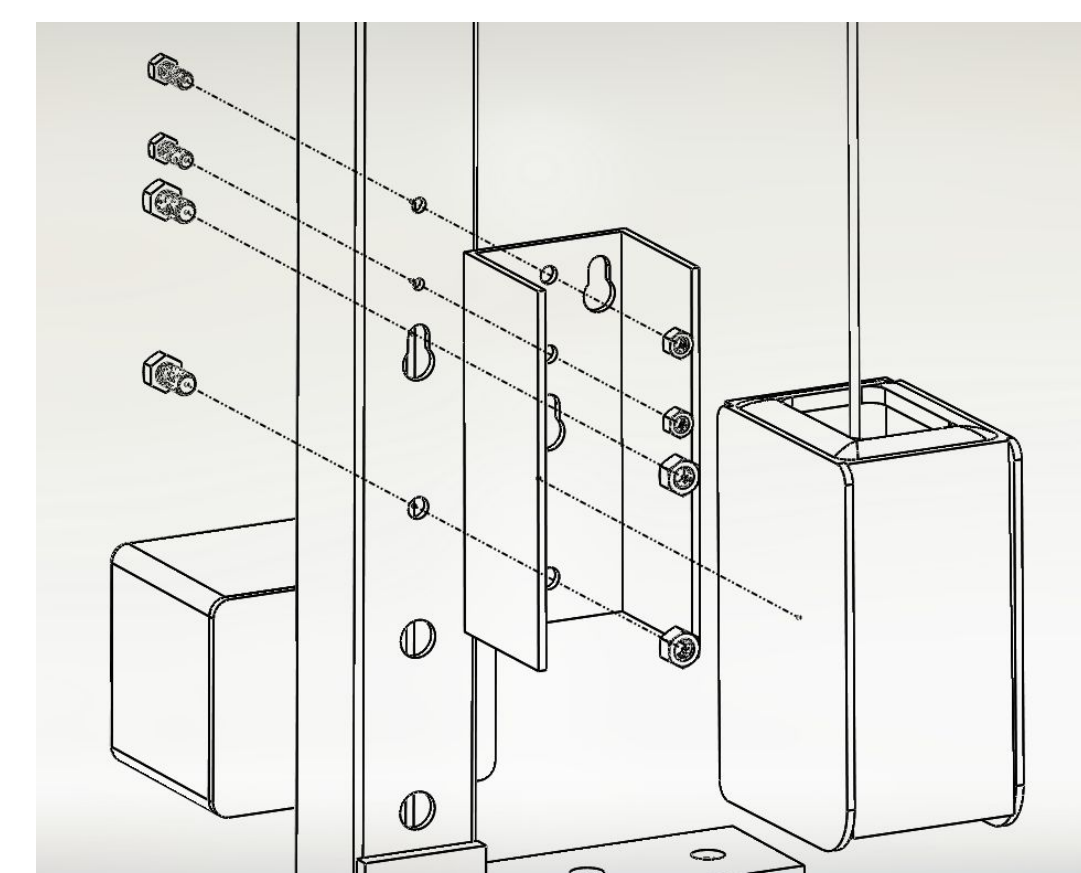


Fig 4. Winch

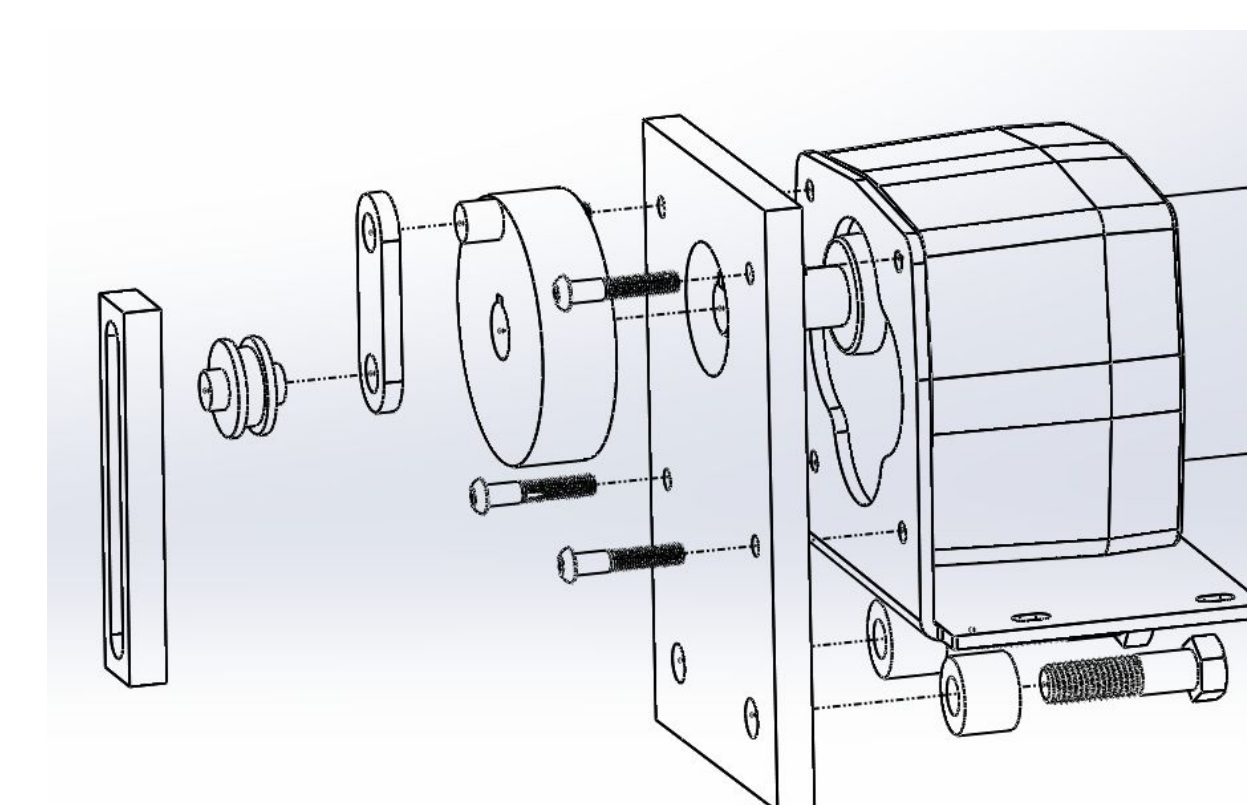


Fig 5. Dynamic Tensioner

The user is lifted from a seated position to a standing one using a cable winch. The baseline unweighing is set with this winch. When the patient operates the elliptical, a dynamic tensioner maintains the baseline unweighing by tensioning and relaxing the cable.

**Harness**



Figure 6. Three Point Harness

The selected harness has three attachment points, allowing more support and preventing falls. Slings engage multiple points of the body for improved comfort.

**User Interface**

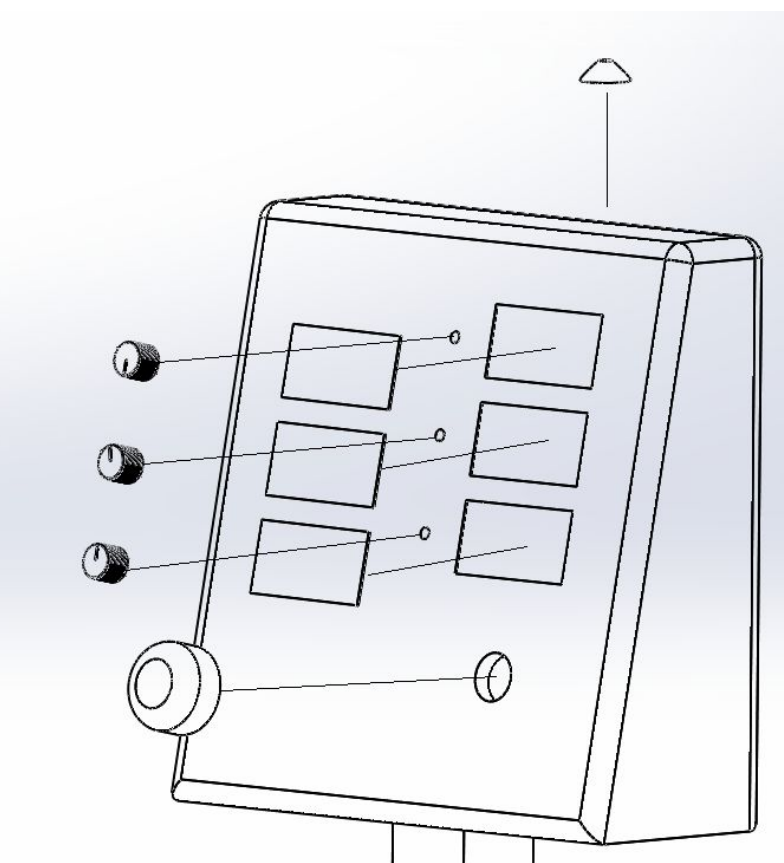


Fig 7. Controller

The user interface is a simple plastic design which telescopes perpendicular to the base to accommodate for the height of the user. Additionally it uses dials to adjust weight offset as well as an emergency stop button.

**Transportation**

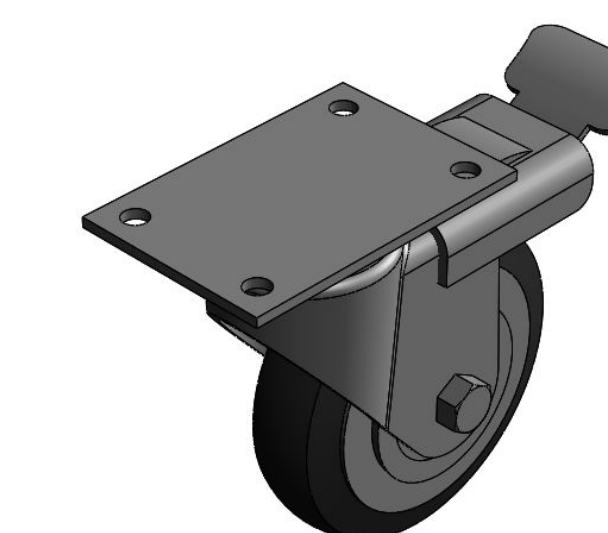


Fig 8. Caster

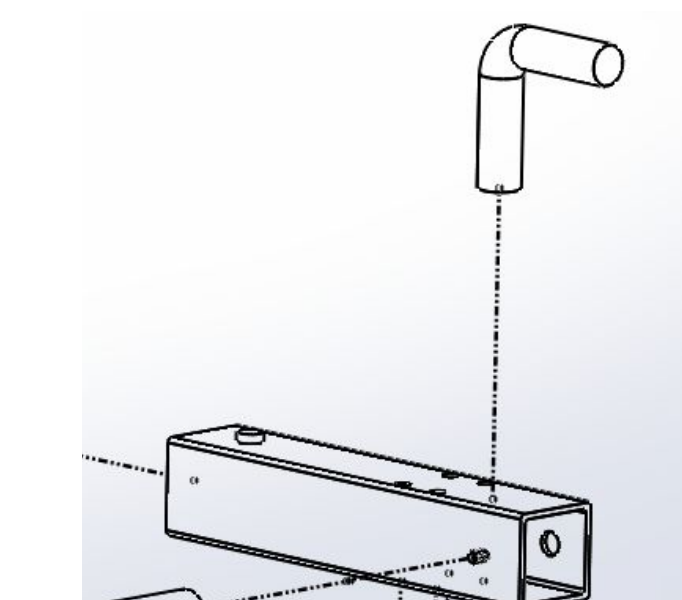


Fig 9. Handle

Transportation is facilitated by 4 caster wheels with directional and rotational locks. The device can be moved using handles located on the frame. Wheel friction keeps the device stationary while operated.

**Cost Analysis:**

- OTS Parts: \$1660.00**
- Raw Materials: \$57.37**
- Manufacturing and MFG Labor: \$116.97**
- Energy Consumption: \$0.02**
- Assembly Labor: \$53.44**
- Total: \$1887.80**





**Customer Needs**

