



# GymPal by the AllFit Team

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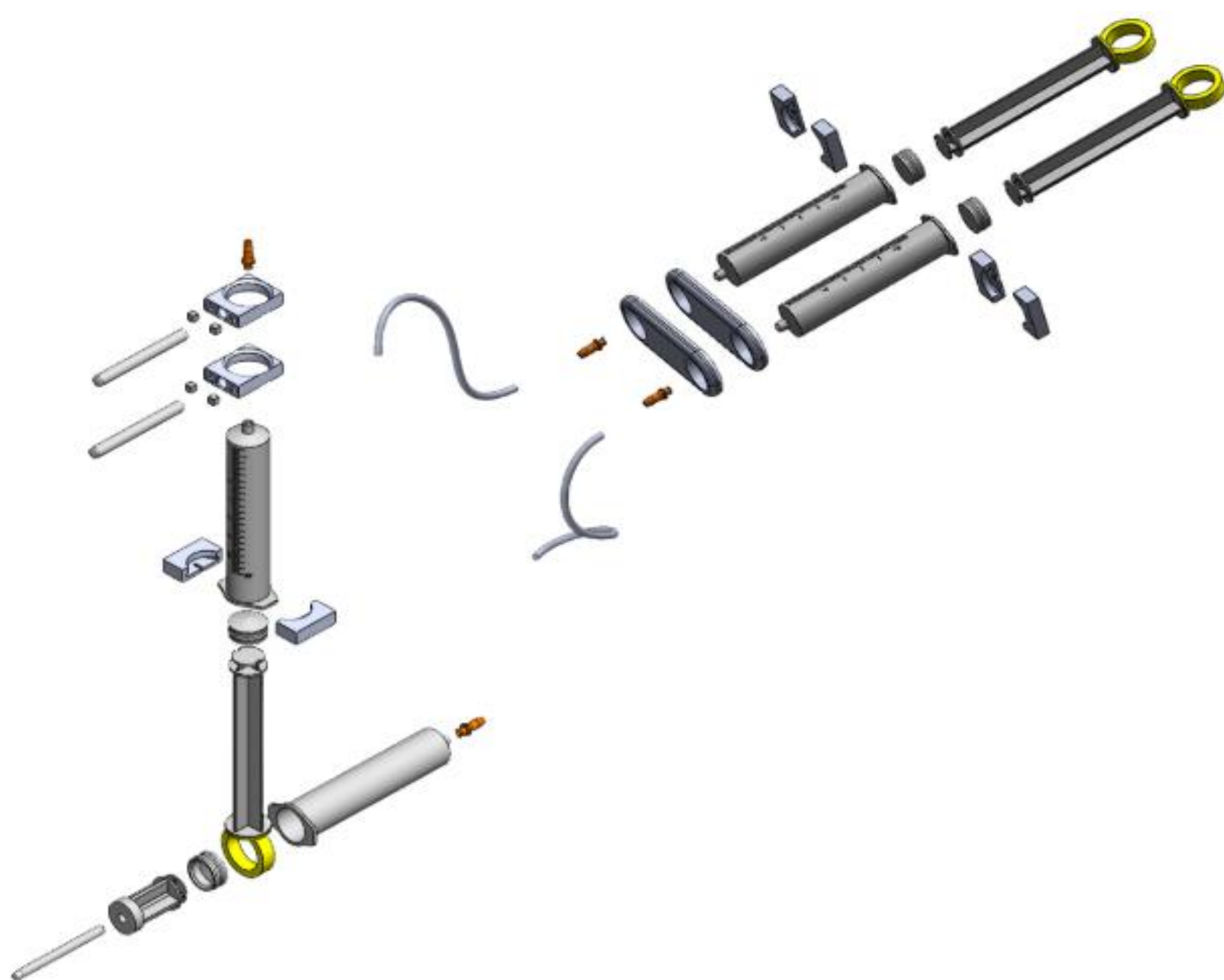
## Background

Wheelchair users and individuals with limited hand function often can't independently adjust weight-selector pins on cable gym machines — a task that requires forward reach, grip strength, and precise coordination. Existing adaptive solutions are unstable, hard to use alone, or need constant repositioning. GymPal addresses this by mounting directly to the weight stack and using a pneumatic actuator to handle vertical positioning and horizontal pin insertion, letting users change resistance with minimal physical effort. A friend or caregiver installs the device once; the user then adjusts resistance independently throughout their workout.

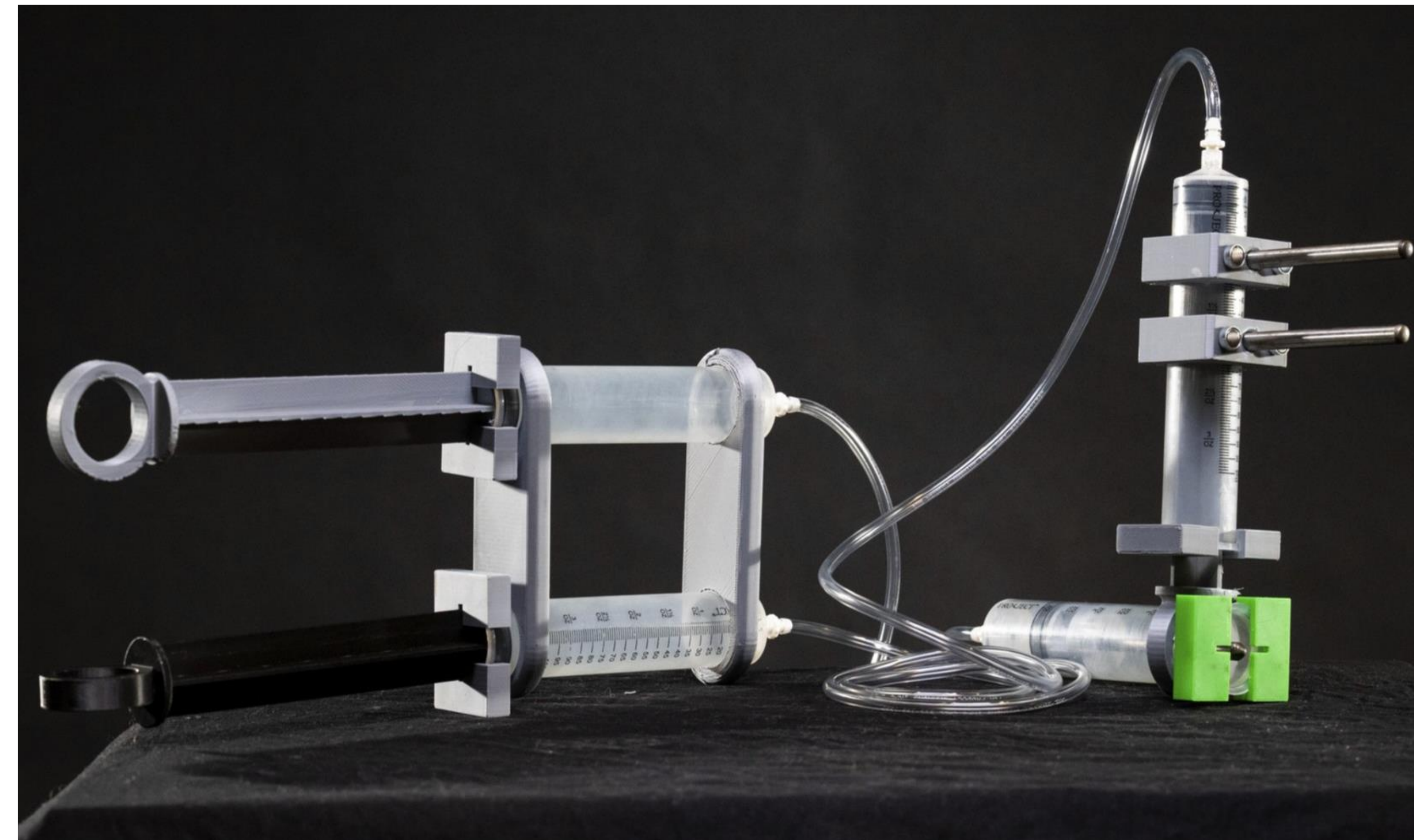
## Specifications

- Weight of 1.3 lbs
- Average setup time : 14.28s
- User pushing and pulling force equivalent to 2.5 lbs
- Maximum operation reach of 36 inches
- Portable and comes with a carrying case
- No pinch points
- Aesthetic to fit in gym environment

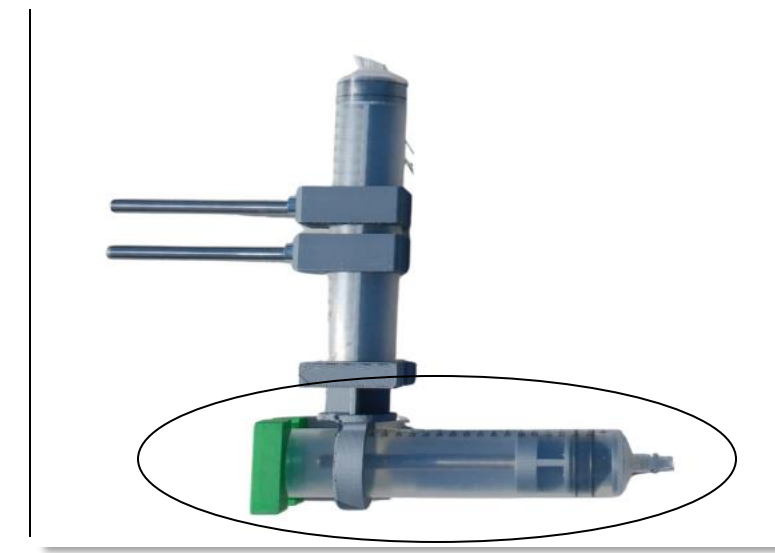
## Exploded View



## GymPal

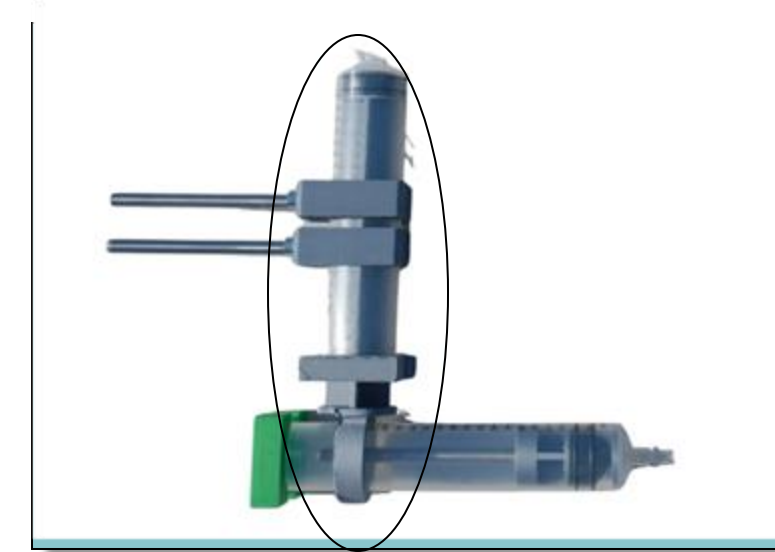


## Key Components



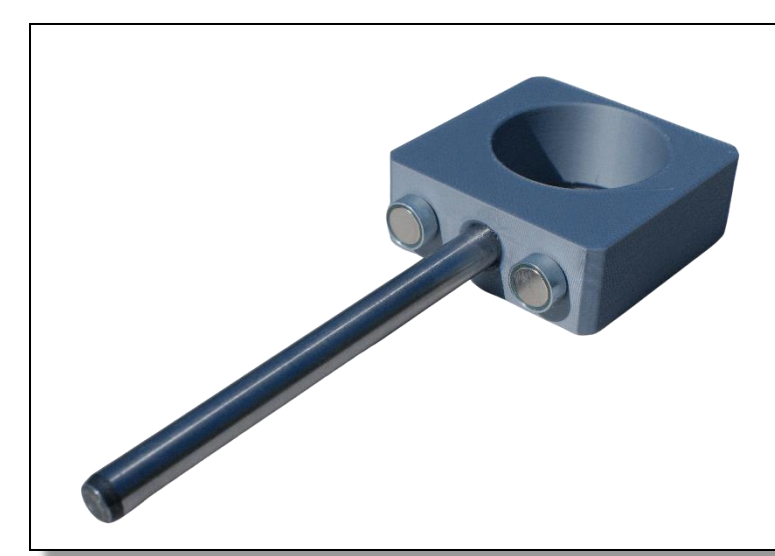
### Horizontal Syringe

Moves the selector pin in and out of the weight stack



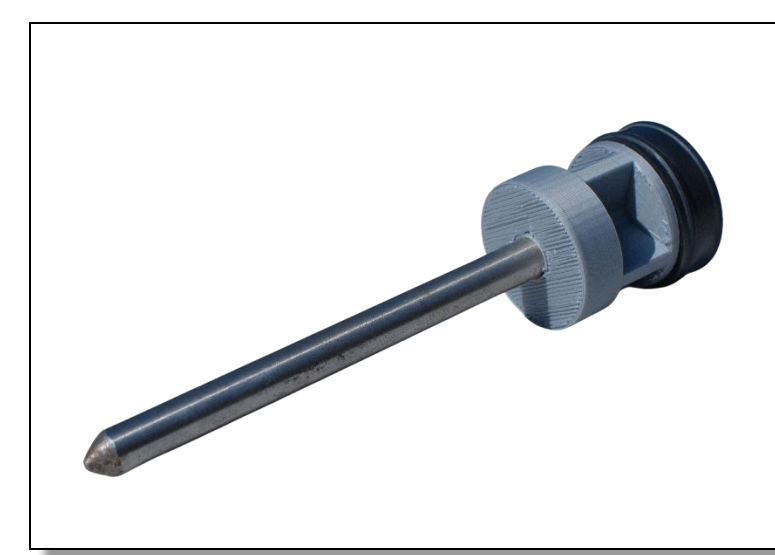
### Vertical Syringe

Changes the selected weight by moving the pin mechanism up and down



### Pin Cap

Interfaces gym pin with syringe mechanism for controlled motion



### Attachment Piece

Secures and aligns the syringe system to the weight stack during use

## Independent Weight Adjustment Testing



- 85% Reliability Rate (42/50 successful trials)
- Average Weight Adjustment Time : 9.66 s
- Successfully tested with project sponsor and Paralympic athlete Steve Ferreria

## Cycle and Drop Testing

### Actuation Cycle Testing

- Survived 6,690+ actuation cycles
- 1 cm<sup>3</sup> pressure loss (≈ 0.050 in)
- Demonstrated minimal performance degradation after testing

### Drop Testing

- Passed concrete drop test from (3ft, 4ft, 5ft, 6ft)
- Tested in 3 different orientations

