Peace of Mind Braking System

Mechanical Engineering
UNIVERSITY OF COLORADO BOULDER

Delta Horizons · University of Colorado Boulder · Design Center Colorado

Ashley Atkins, Ben Finan, Brandon Cyrus, Evan Hanson, Julia Beattie, Tiana Decolati

DELTA HORIZONS
Team #43

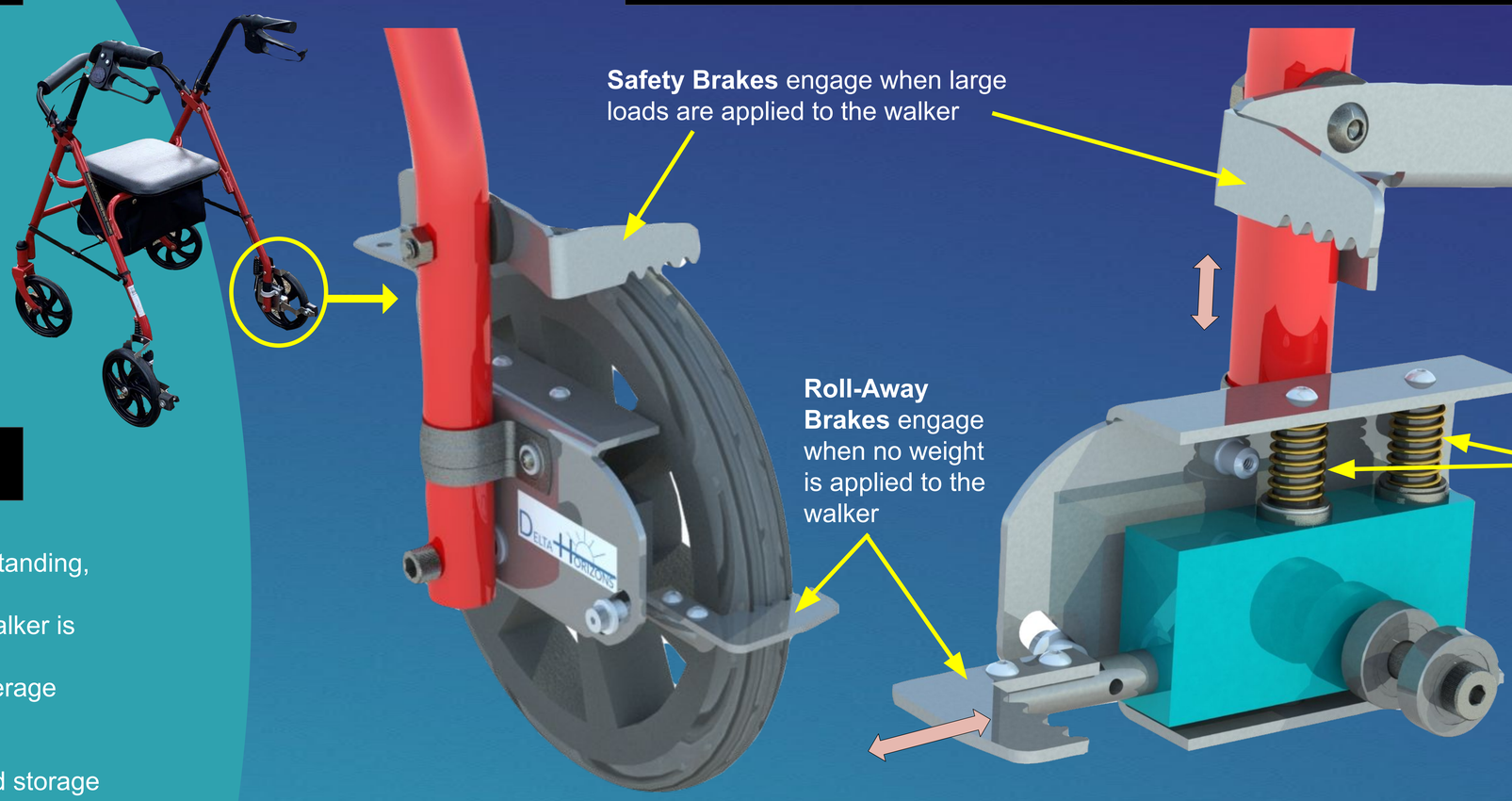
Background

- **Problem:** Standard hand brakes on 4-wheeled walkers require conscious input, which allow the walker to slip out from underneath the user and can be dangerous in the cases of standing or falling
- **Mission:** Improve safety of 4-wheeled walkers
- **Strategy:** Design a mechanical walker braking system that engages at the proper time without conscious user input

Requirements

- Automatic and manual brakes
- Safety brakes engage during falling, standing, or sitting on the walker
- Roll away brakes engage when the walker is unattended
- Braking thresholds suitable for the average user
- Maintain expected walker lifespan
- Does not interfere with any folding and storage of the walker

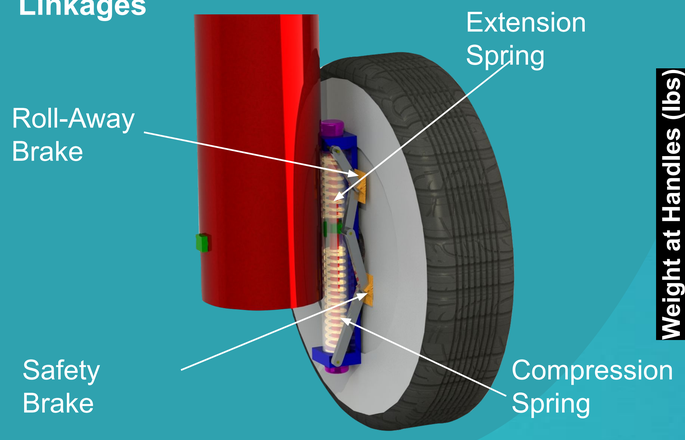
Design



- Resting arm weight of the user deactivates the **Roll-Away Brake**
- As springs compress, **Roll-Away Brake** travels along an angled slot, moving the brake arm away from the wheel, allowing regular walker use.
- Two different springs are incorporated to allow for more precise braking thresholds and longer spring life.
- Further compression of the springs brings the **Safety Brake** into contact with the wheel.

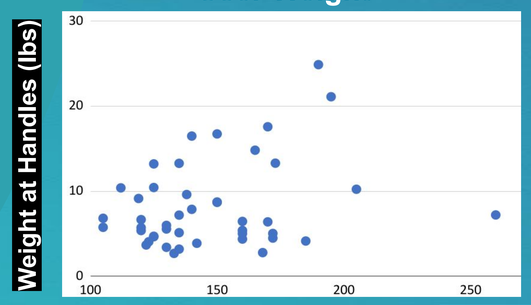
Previous Designs

Linkages

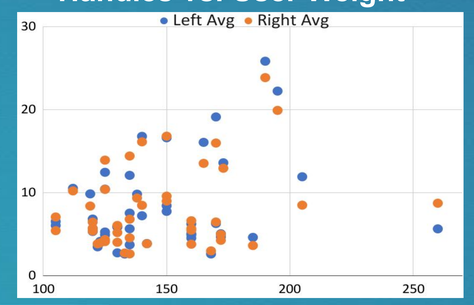


Testing Data

Average Force at Handles vs. User Weight



Left & Right Hand Forces at Handles vs. User Weight



Conclusion

Results:

- Prototype with 2 braking modes
- Decreased cost & complexity from prototype 1 to prototype 2
- Won cross-campus competition of NVC and advanced to semifinals of main competition

Future Considerations:

- Add a cover to keep debris out
- Trade non load-bearing components for plastic
- Offer additional sizes
- High-volume manufacturing possibility

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HOVER SENIOR LIVING COMMUNITY
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