

Motivation, Goal, Impact

Motivation: Many elderly walker users have difficulty carrying various items easily

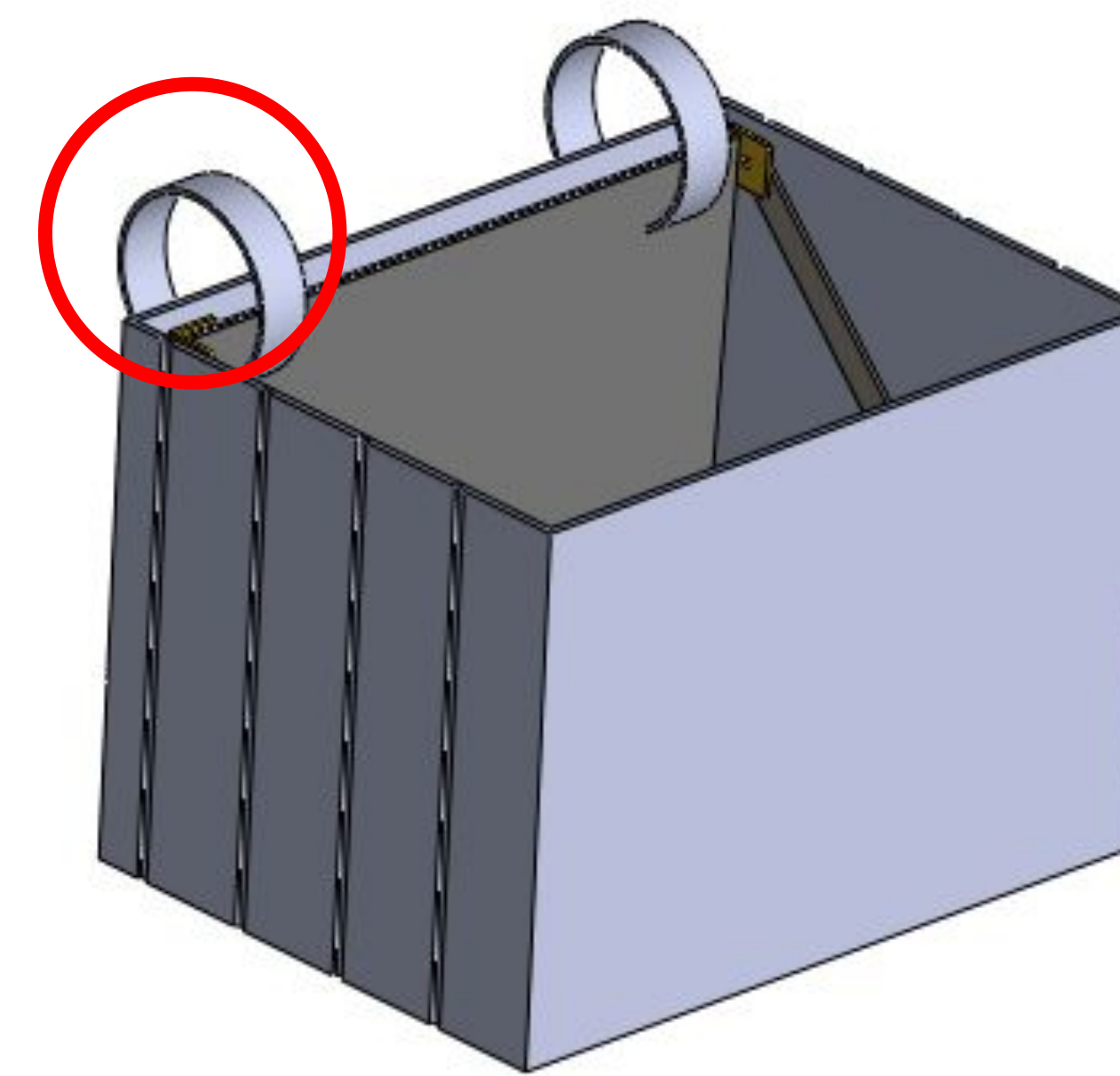
Goal: Create a purely mechanical device to attach to walkers universally, and supports up to 5 kg of mixed loads

Impact: Help elderly keep their independence



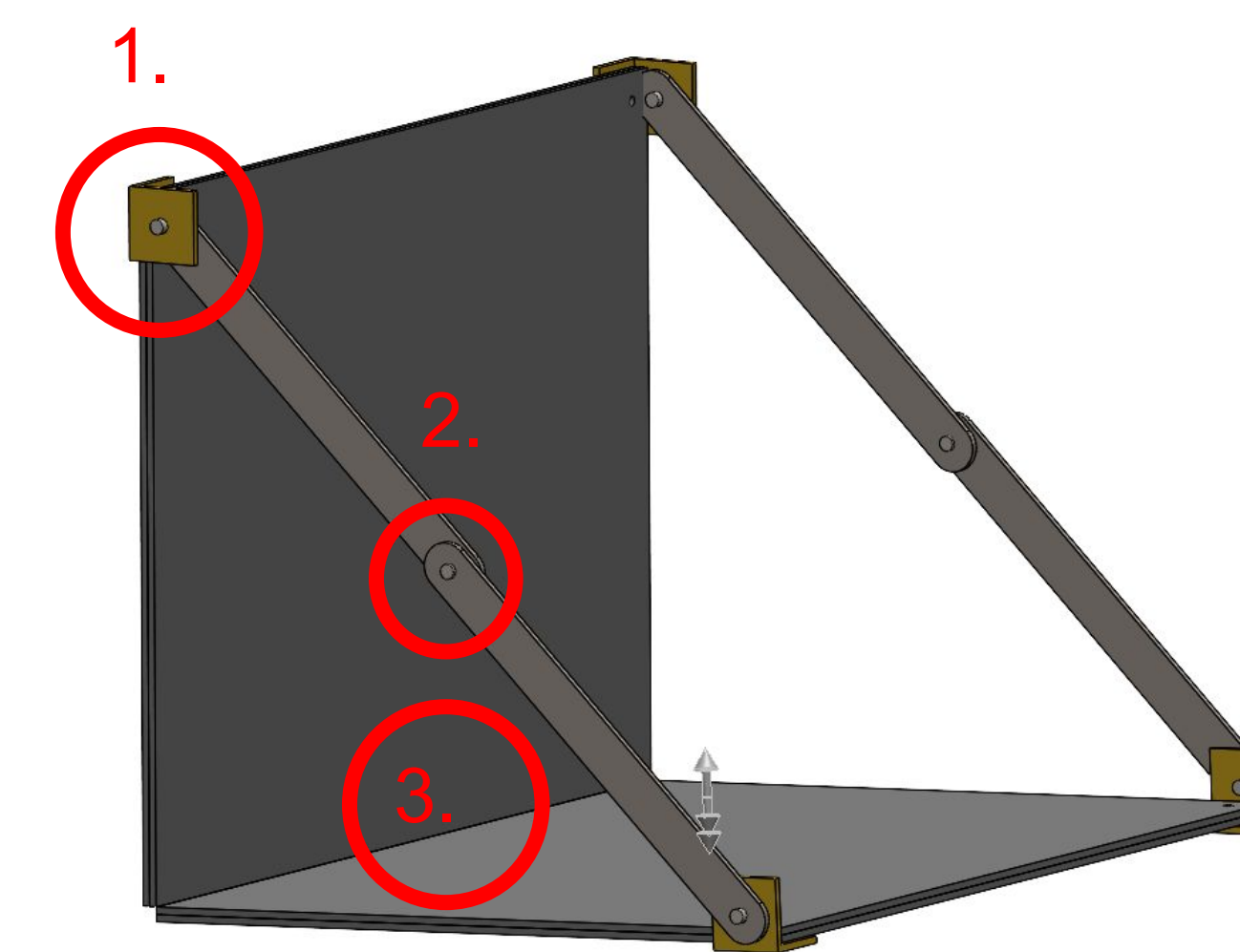
Requirements

- Safe to use and easy to install
- Supports items such as groceries (bags), drinks, laundry, trash
- Supports up to 5 kg
- Does not interfere with user / swing & torque control
- < \$60

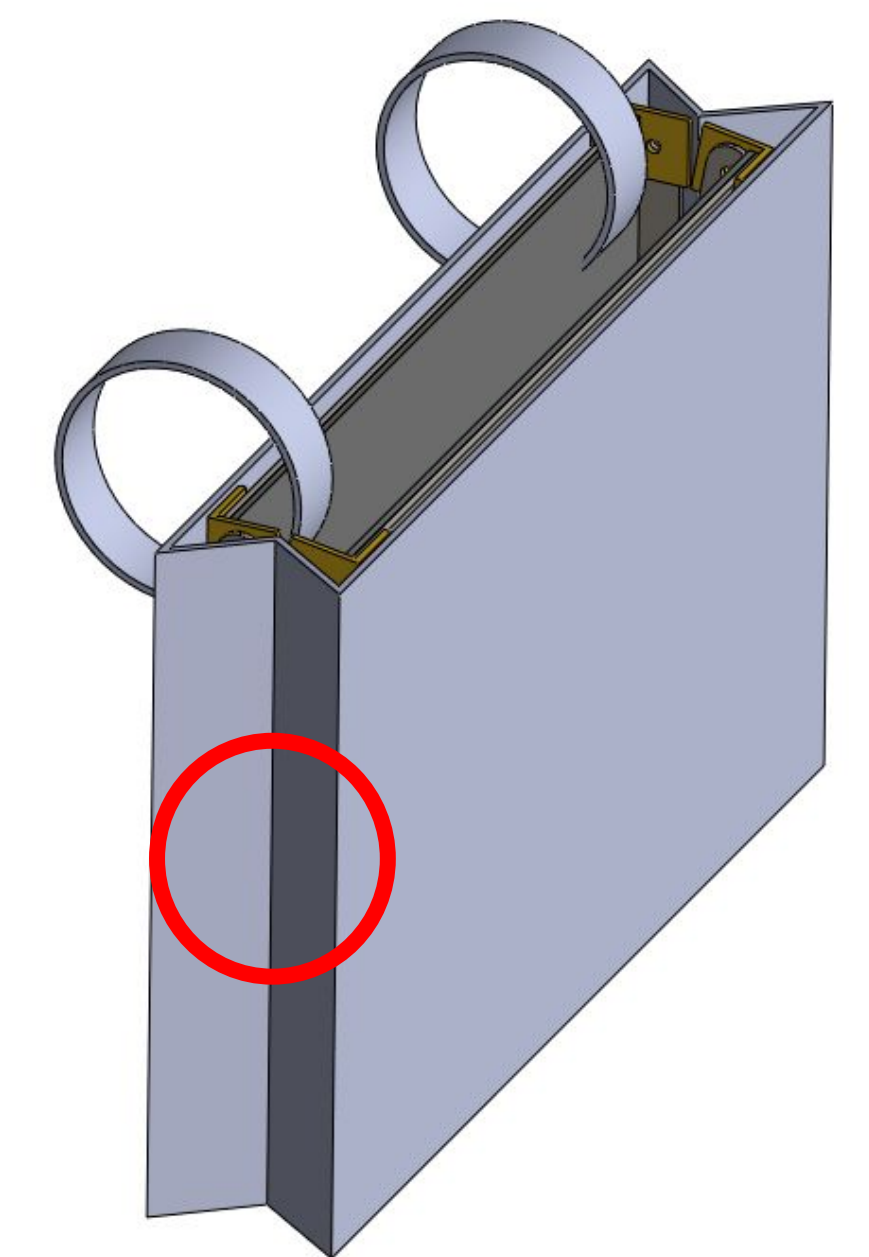


- Exterior subsystem, fabric exterior using a system of straps and buckles that mounts to the walker

Final Design



1. Hinges present on the boards acting as a pivot
2. Linkage system used to support the everyday item
3. Hinges along the bottom edge allow for foldability



- The exterior fabric folds and collapses alongside the interior shelf to allow easy foldability and storage

Design Calculations & Decisions

Unloaded COG:

- (x,y) = (16.42, 28.65)

Loaded COG:

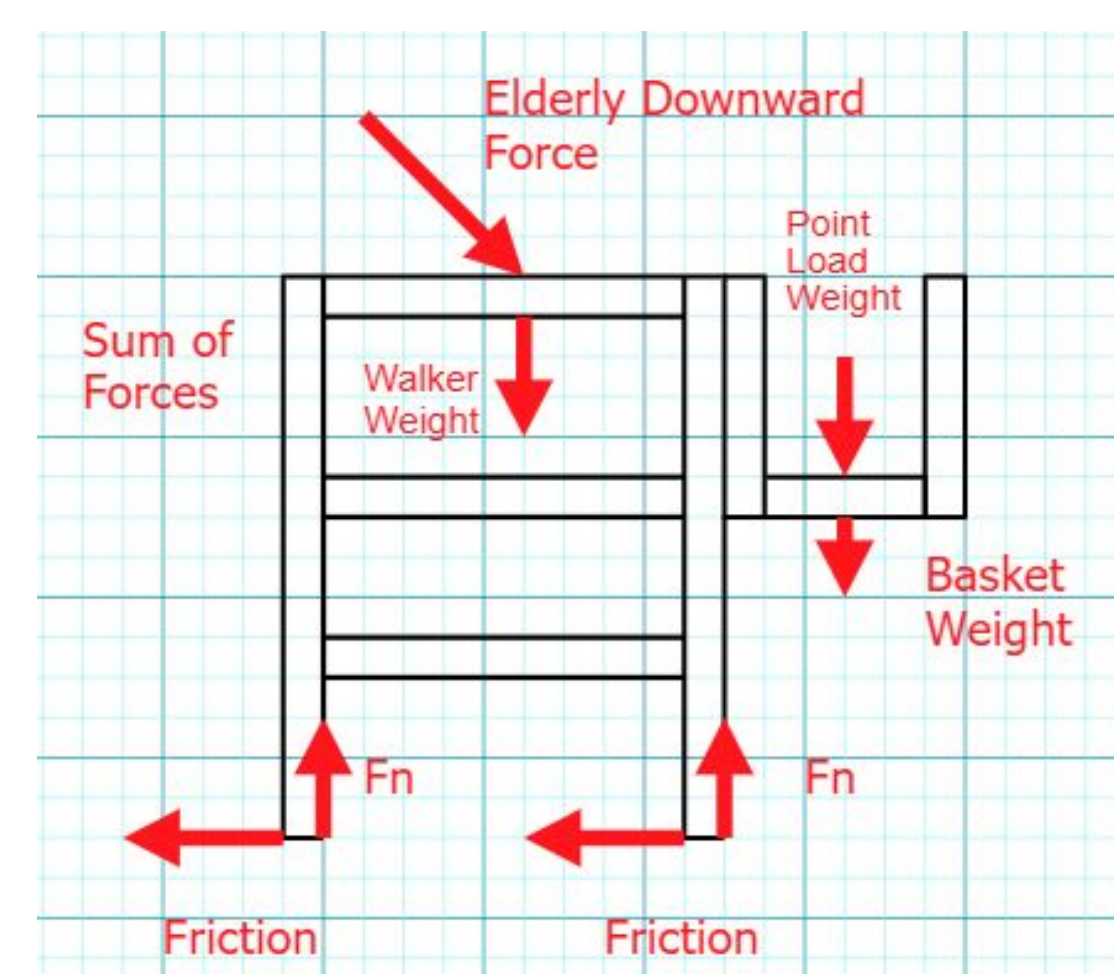
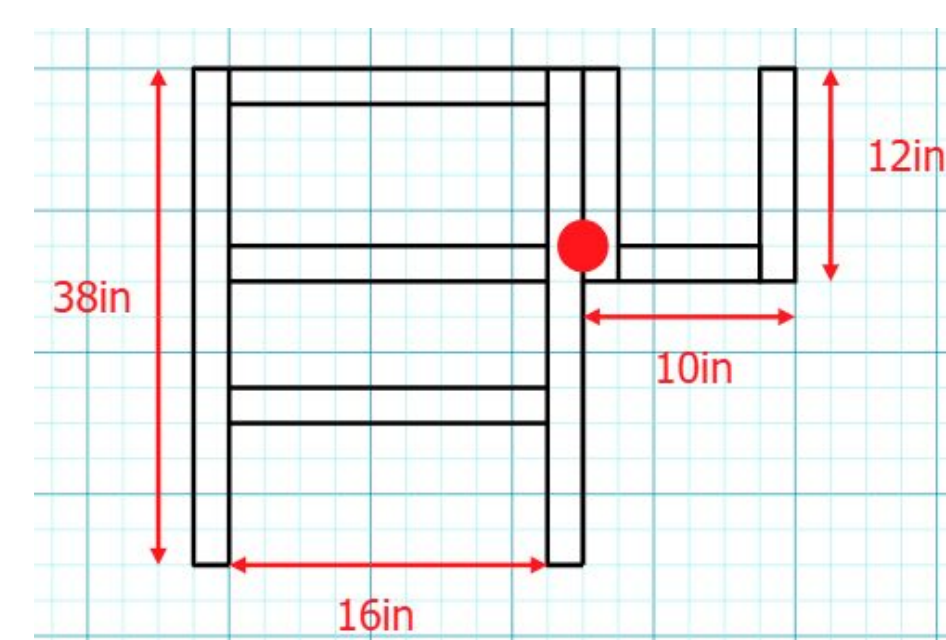
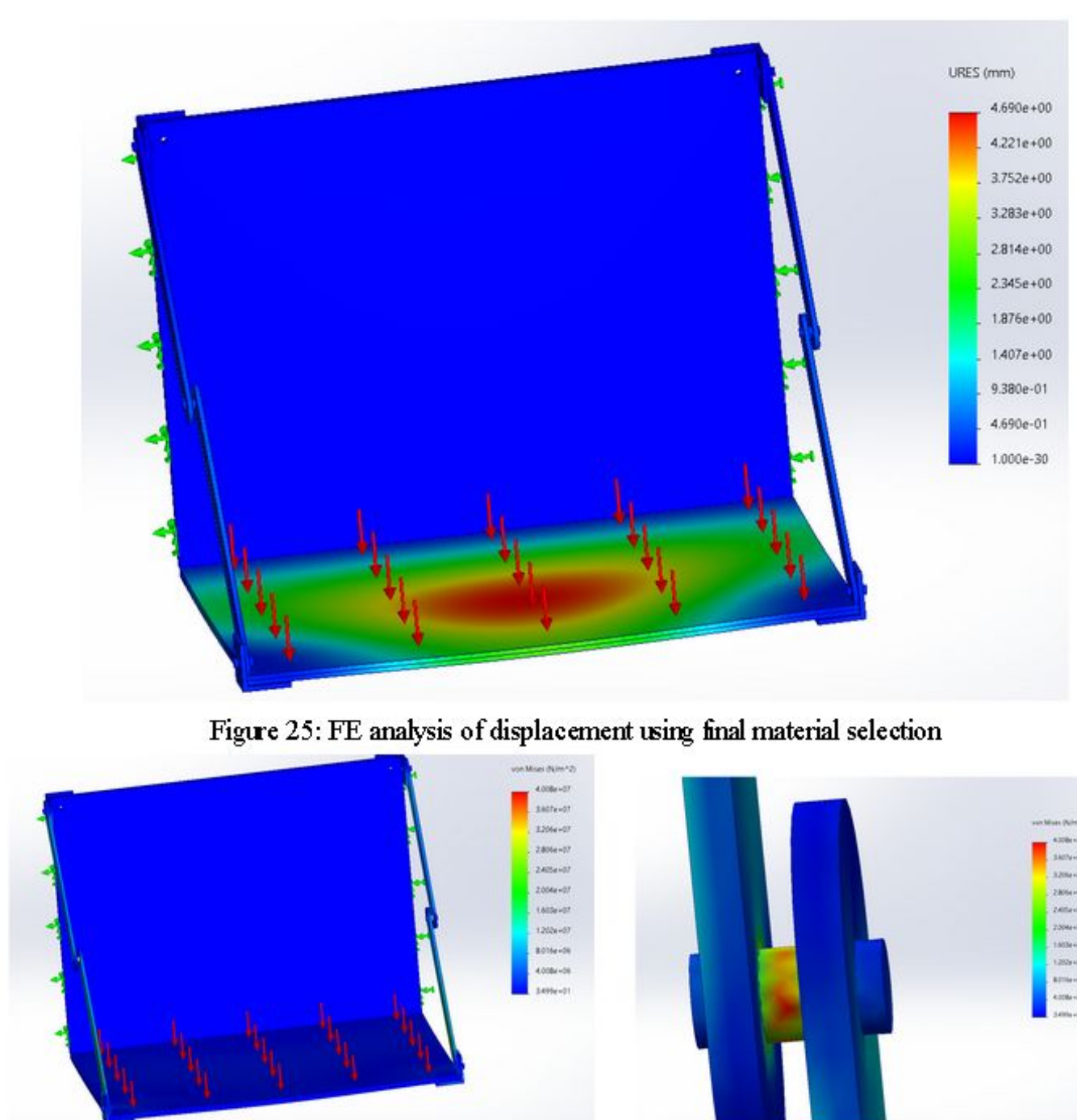
- (x,y) = (19.87, 28.29)

Slip or Tip:

- Slips under load of 19.7lbs of applied force when fully loaded
- Doesn't tip under point load of 5kg

Safety Factor:

- 66



Prototype & Test Results



- 5 KG point load tested in the interior configuration
- Minimal deflection in supporting faces, small bending of the linkages



- 5KG distributed load tested in interior distribution
- No deflection nor bending of the linkages



- 5KG distributed load tested in exterior configuration
- No deflection nor bending of the linkages



- Folding mechanism of the attachment mounted to the interior of the walker

Overall: Through extensive testing of 5kg point loads we determined our bag can handle that weight which would fulfill the requirement of weight most elderly would have to manage