

Key Features

Handle

- Ergonomic: designed to distribute pressure on the forearms instead of the wrists, reducing the risk of wrist injuries.
- Forearm padding with cushioning to enhance user comfort.
- Grips are contoured to fit the user's hands, featuring a larger diameter for improved ease and comfort of grip.

Foot Attachment

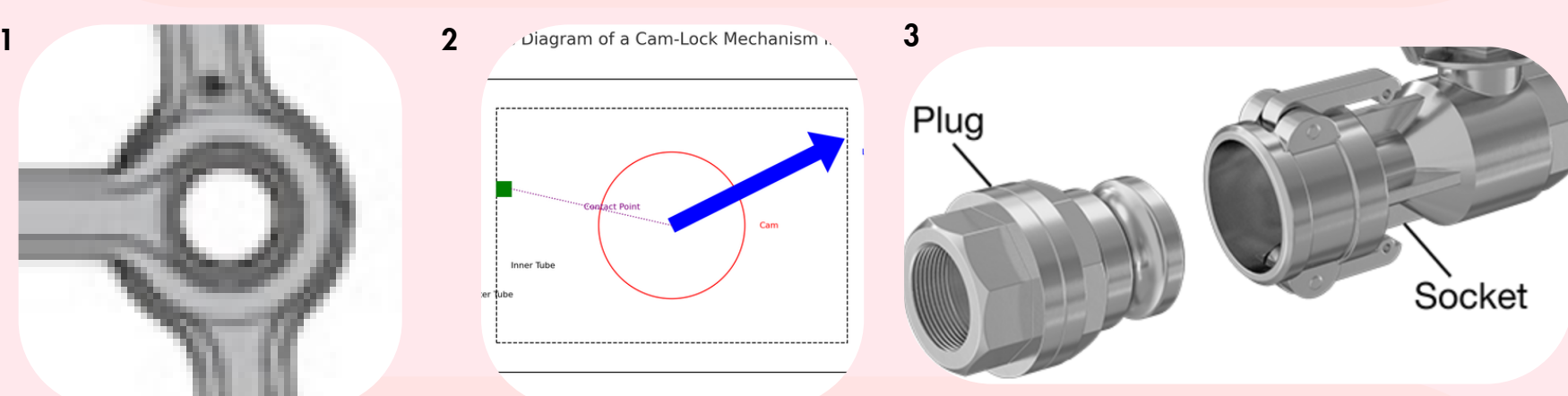
- Skateboard wheels offer durability and shock absorption, ensuring a smooth and silent ride on uneven surfaces.
- Their compact size allows for easy maneuverability, especially in tight spaces.
- The slider foot's low-friction surface enables smooth gliding, reducing the effort required to maneuver the rollator.

Kinematics of Frame

- Degrees of Freedom: Crutch joints rotate and slide to adapt to stair angles.
- Motion Transfer: The crutch aligns with the intention of safe stair mobility.
- Stability and Control: The crutch's design provides reliable support on any incline for confident strides.
- Adjustment Mechanisms: Adjustable height and step size customization dials create a tailor-fit experience.

Locking Mechanism

- Cam-lock mechanisms consist of a cam, a rotating or sliding piece, and a locking component.
- Rotating or moving the cam engages or disengages the locking component.
- This action locks or unlocks the mechanism.



Components:

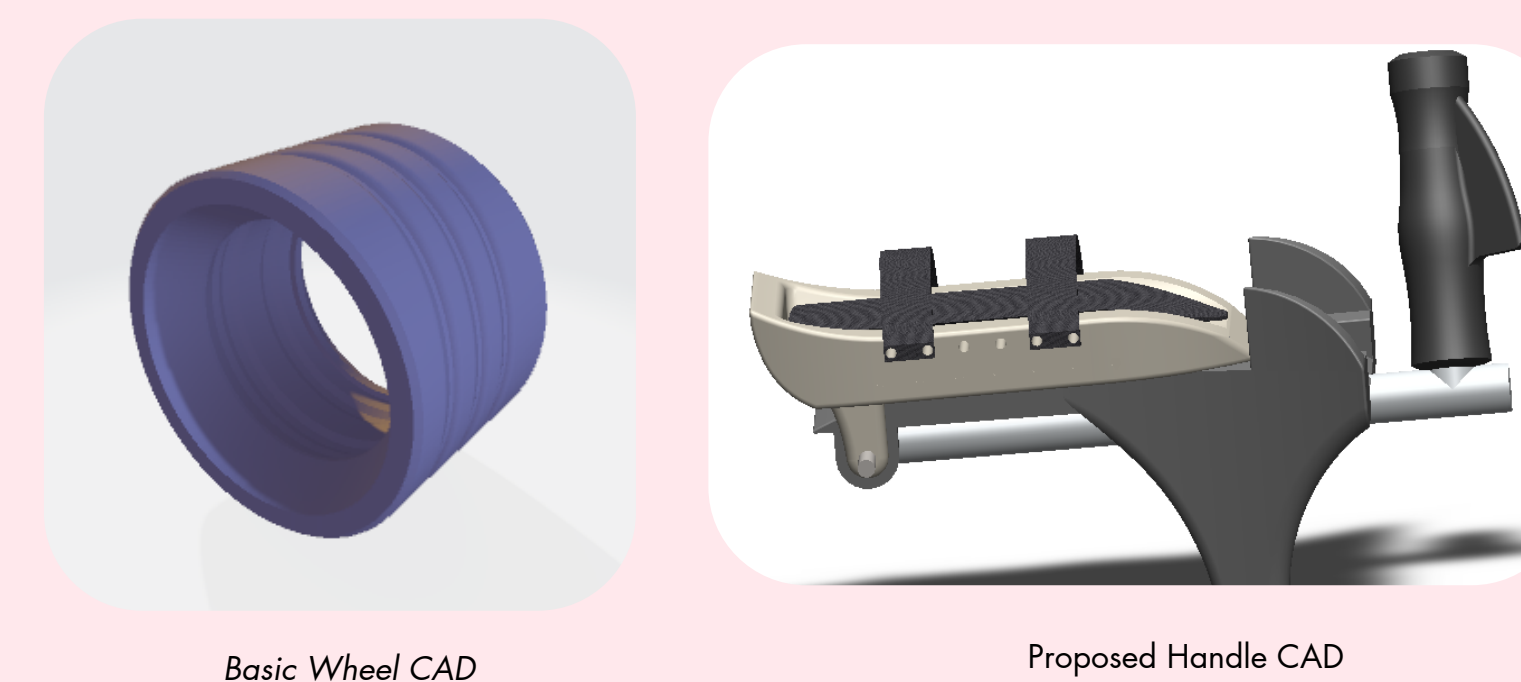
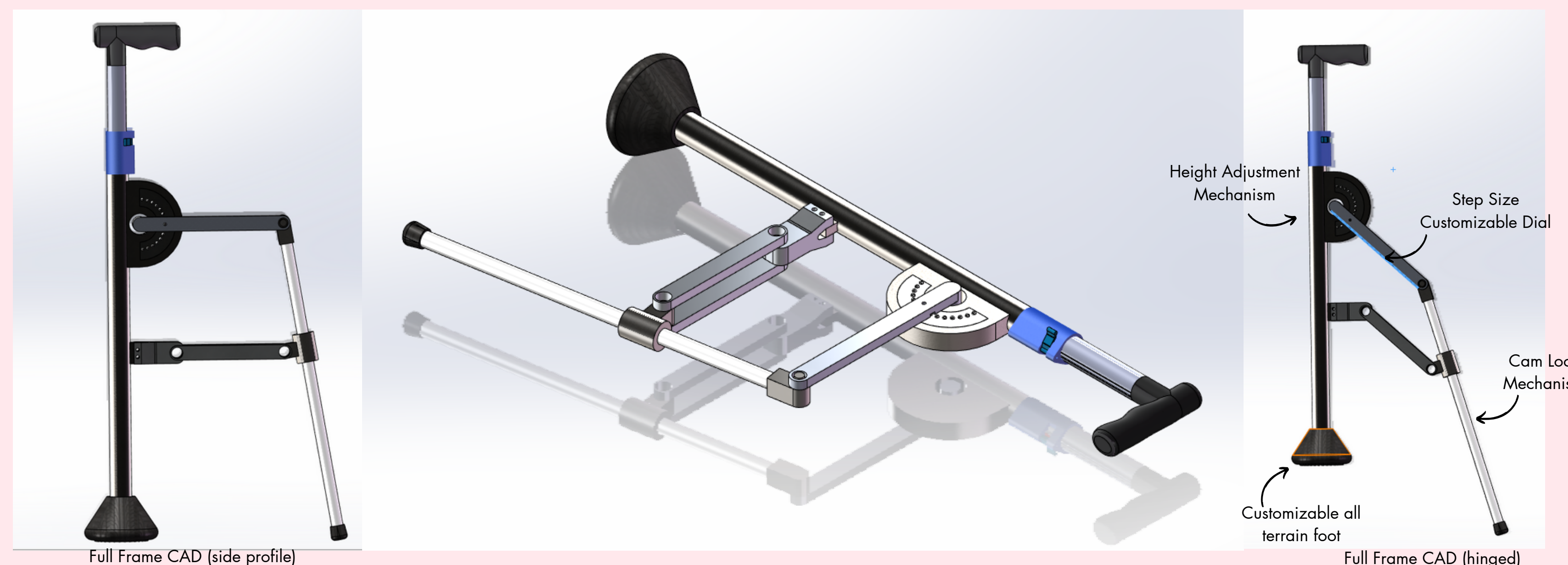
1. Cam: A lever-activated cam will be attached to the outer tube.
2. Locking Component: A series of holes or notches on the inner tube.
3. Shaft: The crutch's shaft will be made of two or more telescoping tubes.

Better Than Crutches!

Executive Summary

Design, fabricate, and assemble a better alternative to crutches for less ADA-accessible areas and individuals with lower extremity injuries. Our design will allow the user to comfortably and safely traverse varying terrain such as stairs, inclines, and declines for different surfaces.

CAD model



Safety & Societal Impact

- Enhancing quality of life for individuals with physical disabilities
- Improving user safety, especially on staircases
- Fostering social inclusion by enabling mobility on diverse terrains
- Ensuring affordability and accessibility for all in need

Future Improvements

- Enhancing the kinematics of our 4-bar linkage design through the exploration of varied joint and linkage configurations.
- Streamlining the device for improved portability on staircases.
- Enhancing the height adjustment mechanism for increased efficiency and sophistication.
- Crafting a design that enables easy folding or collapsing to enhance portability and storage convenience.
- Elevating the design aesthetics to elicit favorable responses from users.

Requirement Type	Requirements	Originating needs
Functional	(FR - 001) The device shall support the user while walking (FR - 002) The device shall traverse stairs that are 7.5" or less (FR - 003) The device shall have adjustable handles to accommodate users of different heights.	StN - Ability to traverse varying terrain
Usability	(UR - 001) The device shall have adjustable handles to accommodate users of different heights (min. 5' to max. 6') (UR - 002) The device shall be able to endure a weight of 300 lbs (UR - 003) The device shall be made of lightweight and durable materials	StN - The device shall be durable StN - Lightweight
System Interface	(SIR -001) The device shall provide easily accessible buttons/levers to adjust to at least 4 height options (SIR -002). The device shall have a locking component to lock in height adjustment	StN - Easy to use StN - Adjustable

Team Members

Ashley Kang Ambar Gonzalez Alex Fouras
Yanzhuo Liu Boteng Jiang

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