Prosthetic Thumb

Design prosthetic thumb to complete everyday tasks

- open a pill bottle
- carry a plate
- pull a suitcase
- eat with a utensil
- button up a shirt

3D printed prosthetic thumb with silicone exterior, actuated by a friction hinge that can be locked into position with a lever

Full Prosthesis Assembly

Prosthetic Thumb

Prosthetic thumb is attached to arm using custom-fit 3D printed cuff (interior: moleskin padding) secured with boa cable system fitted with easy-to-turn 3D printed cap

Design Process Analysis

Lateral pinch could satisfy the most client-requested tasks as opposed to a palmar pinch. Friction hinge with lever mechanism allows client to manually position thumb before securing with one motion. Arm cuff disperses forces over a large surface area, moleskin padding mitigates possible pain associated with all-day wear. Boa system with custom cap requires simple motion for securing prosthesis to arm.

Hardware Performance

Completes client-requested tasks quickly and effectively with minimal user force. Does not interfere with client’s existing mobility, is comfortable for all day wear, and can be put on & utilized by client without assistance. Operation is intuitive and requires little training.

Prosthetic devices improve amputees’ mobility and allow them to regain independence. This prosthesis will improve the client’s quality of life by giving him back the ability to complete everyday tasks he cannot currently do.

Future improvements

Modify prosthetic thumb to utilize a ball-joint and hinge to allow the thumb to rotate to oppose 2nd digit to give client additional pinch and more capabilities.

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