Ray Grott, MA, ATP, RET

- Director, Rehabilitation Engineering Technology (RET) Project at San Francisco State University
- (AKA Ergo-Man!)

RET Project

- Providing technology for people with disabilities since 1992
- Offices in San Francisco and Berkeley
- Work with public & private agencies, companies, and individuals

Ray Grott, MA, ATP, RET, Director

Ronny Gaal, ATP, RET, PE

Isa Palmer, B.S.

RET Project

- Technology Evaluations
- Worksite accommodations
- Custom design, modification, fabrication
- Setup, troubleshooting
- Training, support, follow-up

Hierarchy of Technology Solutions

1) Existing mainstream product

2) Existing specialty product

3) Custom modification of existing product

4) Custom design and fabrication from scratch

Why is custom work needed?

- Individuality is the nature of disability
- World is designed for able-bodied
  - Built environments
  - Equipment
  - Work activities/tasks
- Off-the-shelf products do not solve all problems

Guidelines for Success with Custom Technology

- KISS
- Don’t over-engineer the solution
- The more involved the technology, the more opportunities for failure.

Keeping it Simple: How could I…

- Open a desk drawer with limited hand strength and dexterity?

- What about file folders?


FRESNO STATE
BULLDOGS

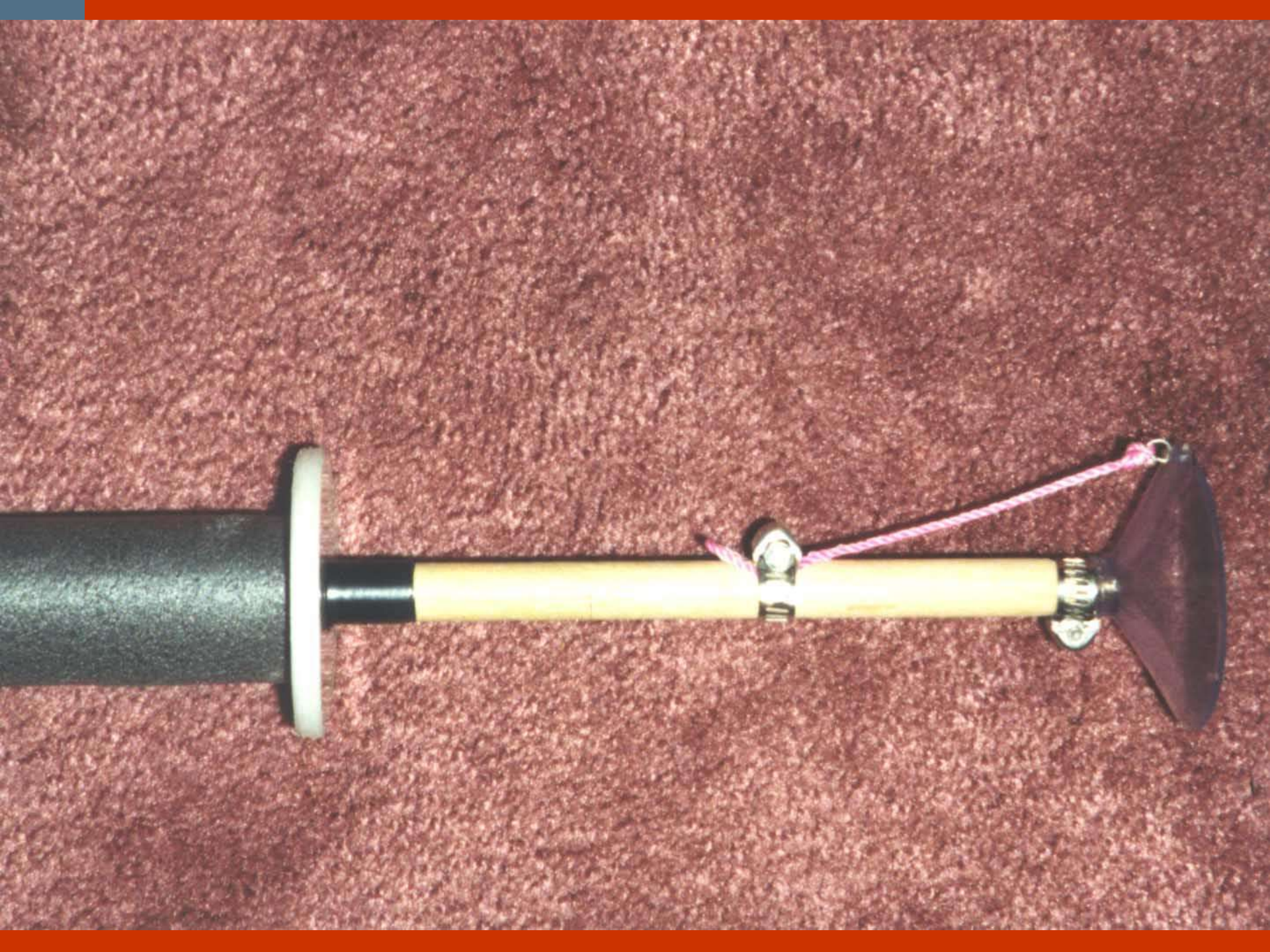
Keeping it Simple: How could I…

- Fill out forms while talking to clients without twisting my back? (or buying a new desk)

Keeping it Simple: How could I…

- As a Blockbuster employee, pick up dropped video tapes from the floor while seated in my wheelchair?


$2.50

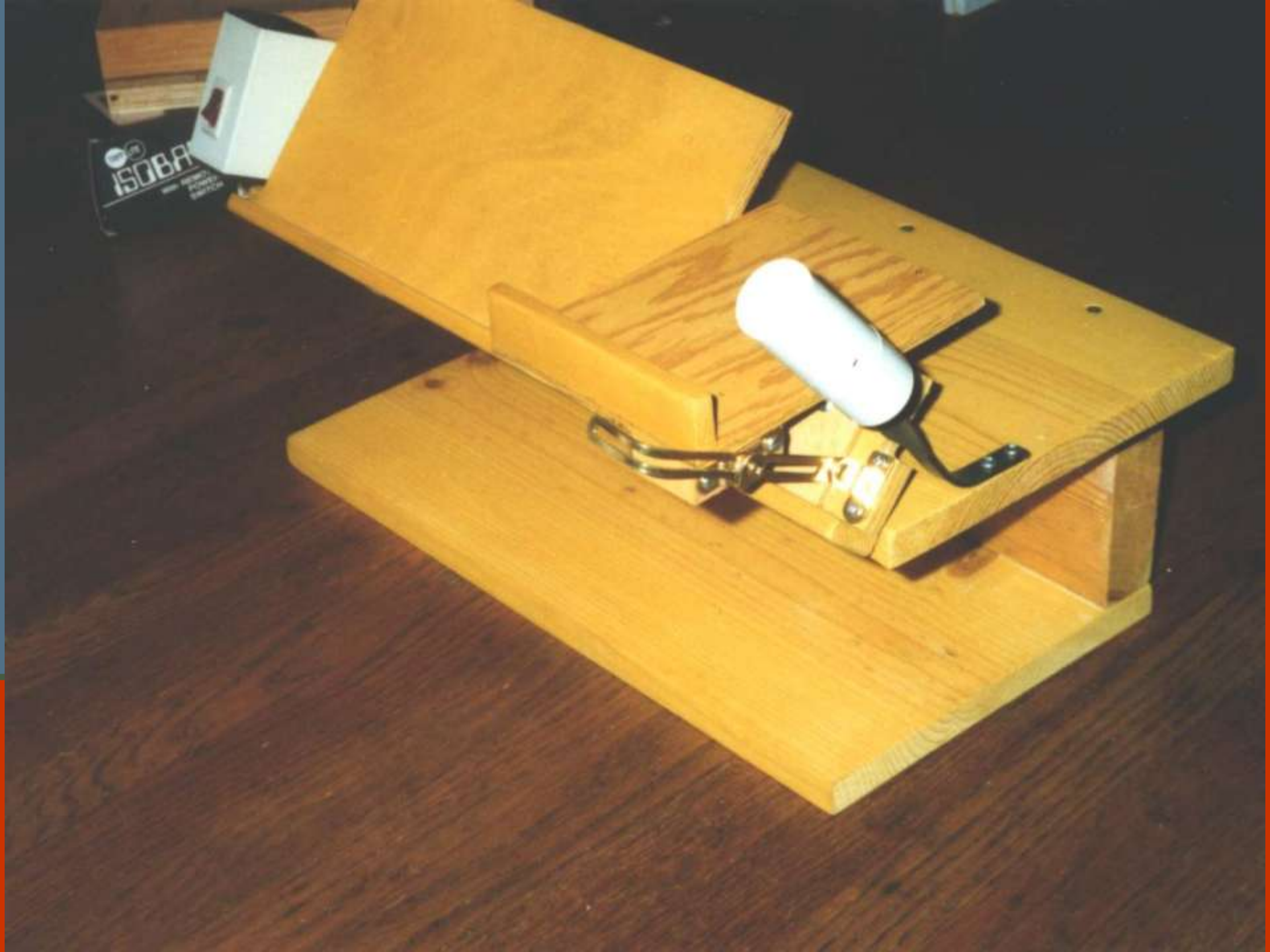


Guidelines for Success with Custom Technology

- Build to fit AND make it adjustable

  “Make It Adjustable Or Make It Again.”

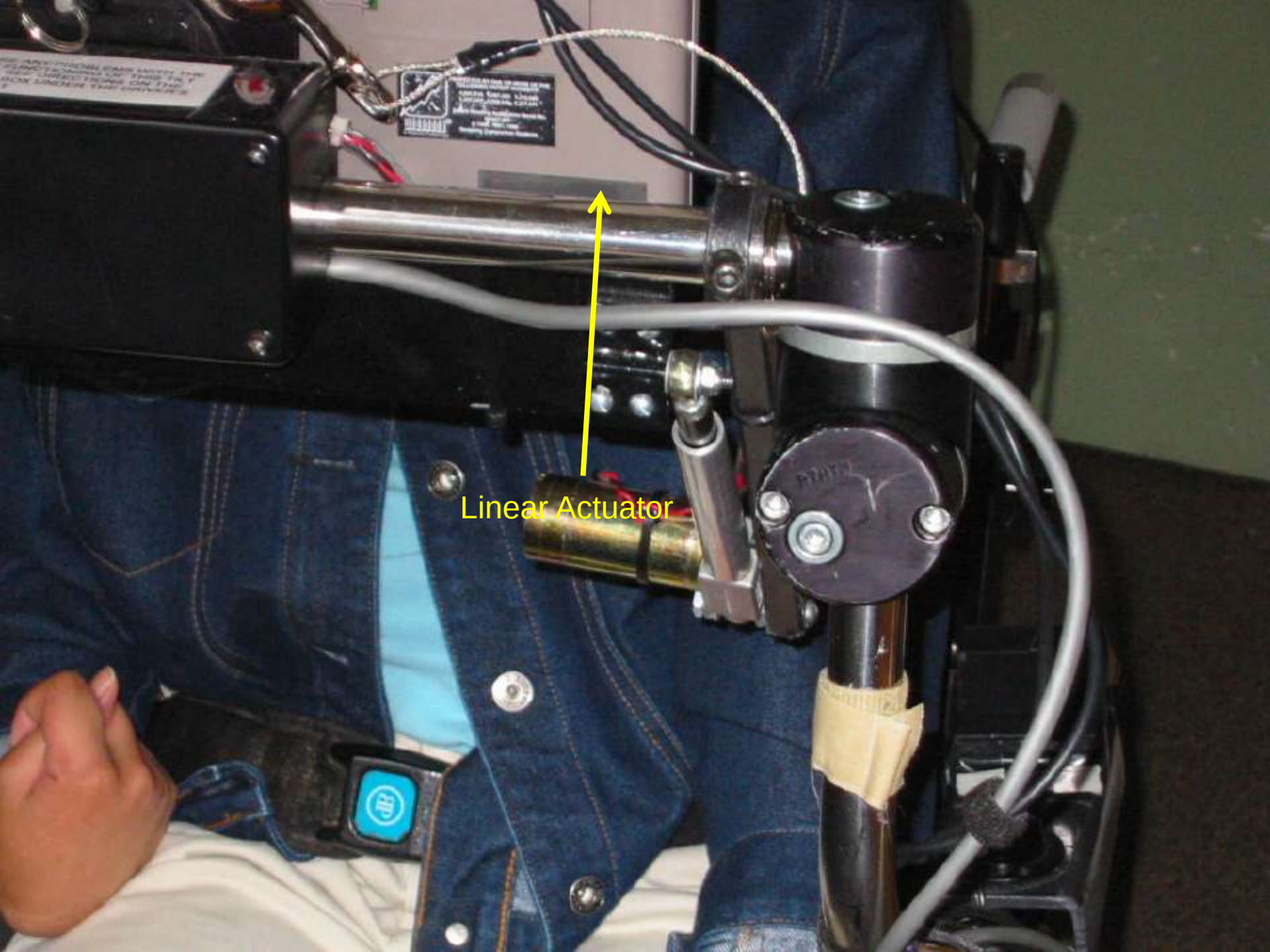

BELIEVE



Guidelines for Success with Custom Technology

- Expect the Unexpected

Swing away communication device


Linear Actuator

More Examples from the Field

How could I…

- Give an office worker with spastic cerebral palsy independent access to papers?


DELL

Is there an engineer in the house?

- Pull Cart with towing and steering provided by a connection from the cart to the back of a hip belt.
- The tow arm should allow for two positions: 1) short for tight maneuvering, 2) long for easier walking,
- Carry up to 60 lbs. of distributed or concentrated cargo, in a space equivalent to four common paper grocery bags
- Fold for public transportation & stowing on boat
- Weather proof and suitable for a marine environment

Foldable Pull Cart

- User needs:
  - Limit lifting objects, and high-force hand use.
  - Maximum single-object lift is 10 lbs.
  - Avoid need to pinch, pull and twist parts
  - Minimize bending down, or working in a bent-down position.
  - Towing load needs to be distributed primarily to the hips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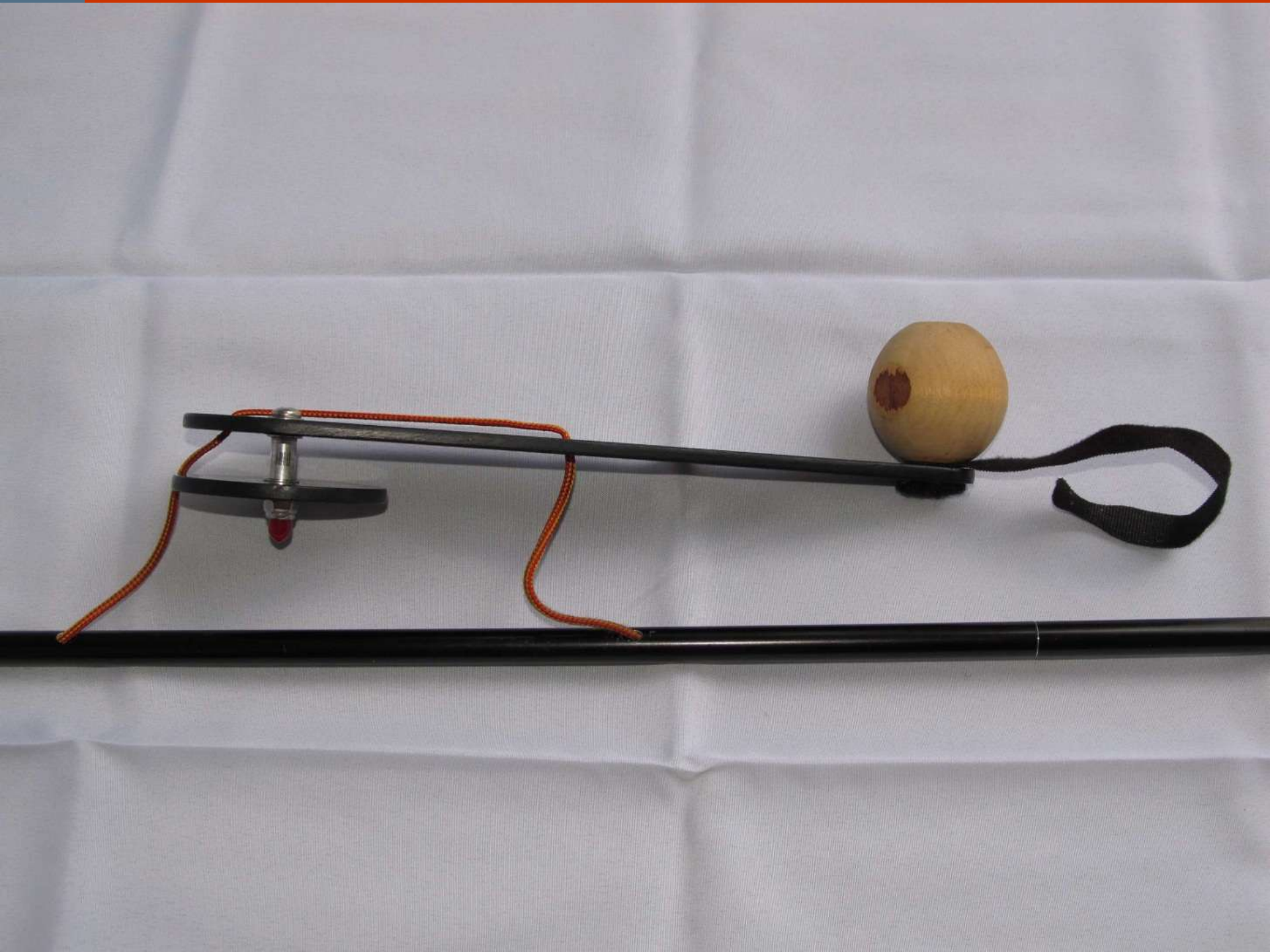

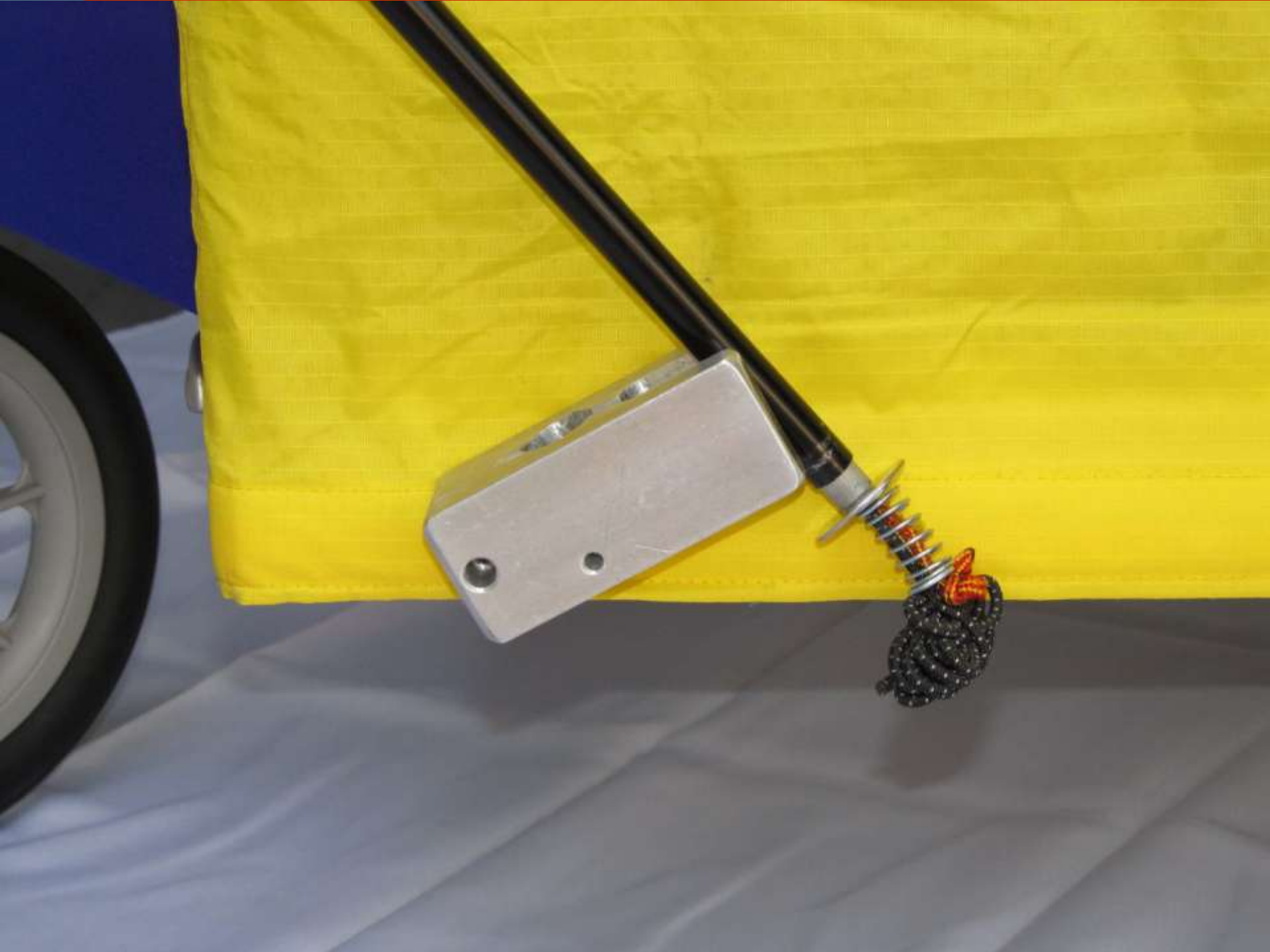


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STOP

Key steps to successful solutions

- Approach problem solving systematically
- Be creative in implementation

Setting the Stage for Designing AT

- Overcome attitudinal barriers
- Know about the end user's needs and abilities
- Collaborate
  - The user as "expert"
  - Promotes acceptance & use of chosen solution
  - Helps in case results are disappointing
- Avoid dictating solutions

Problem Solving Methodology

- Identify the problem (stated vs. actual)
- Analyze the problem and situation
- Research what has been done
- Generate, evaluate, & select solutions
- Implement solutions/ Iterative process
- Follow up

Problem Solving Methodology: Problem Analysis

- Desired goals and tasks
- Individual's abilities
- Environment
  - Physical
  - Social
  - Economic
- Personal preferences
- Anticipated changes

Problem Solving Methodology: Implementing Solutions

- Test with consumer
- Training
- Follow-up