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<https://youtu.be/5-X1j4vC1ug>

Introduction

In an aging society, most of our elderly loved ones hope to stay active and mobile in their senior years. The challenge in achieving such a goal is not only faced by elderly people but also elderly caregivers.

Problem statement:

While existing devices help with the mobility of elderly people, these devices (walkers, wheelchairs, etc.) often come in multiple units, hence consuming space and money. Elderly caregivers are also exposed to risks of falling down when retrieving things (medication, medical records, etc.) from high places if inappropriate tools (chairs, stools, etc.) are used. Lastly, it is not always possible for the elderly to be active outdoors (due to rain, health issues, pandemic, etc.)

Objective:

To design and develop a low-cost and multifunctional stepladder for improved usability.

Benefit to user:

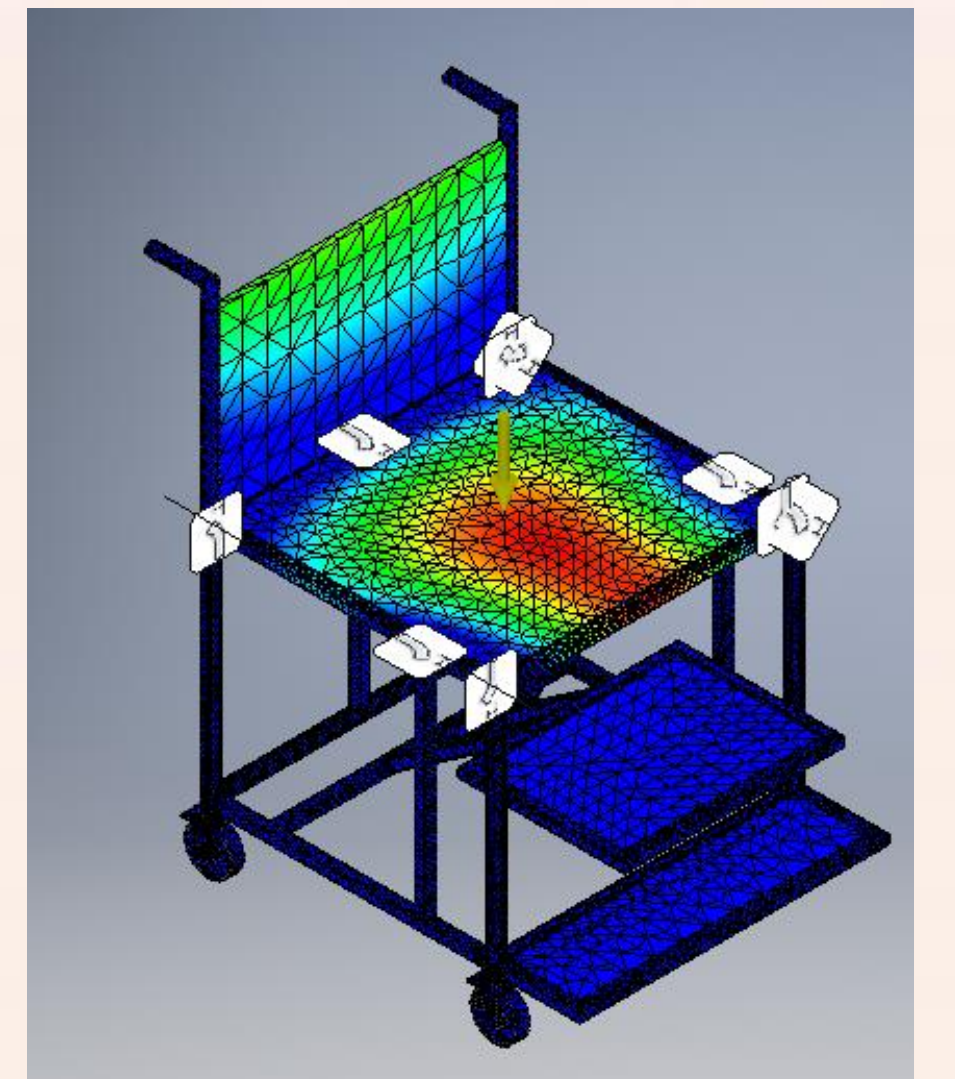
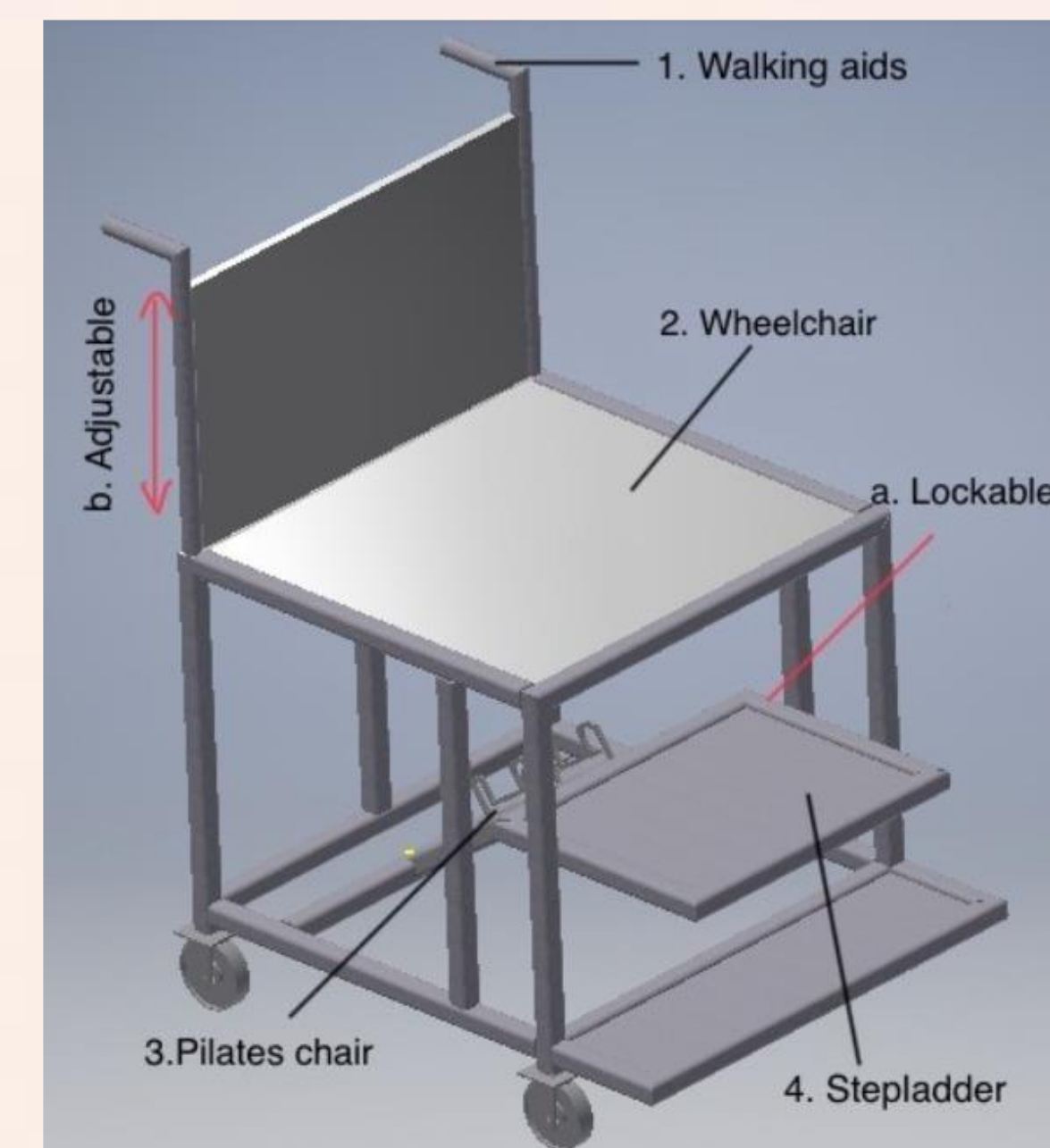
Cost saving, space saving, and increases value for money with 4 functions in one device, reduces risks of injury to caregivers, efficient.

Benefit to society:

Facilitates elderly caregiving, especially in foster care homes.

Technology

The invention discloses four functions, namely a stepladder, a walking aid, a wheelchair, and a Pilates chair. The rigidity of the stepladder is controlled by lockable wheels at the base of the stepladder, and foldable support stands at the base of the second step. The second step is a flexible step controlled by springs. When the Pilates chair is needed, the second step creates resistance at the user's feet for exercise purposes. The foldable support stand acts as a stopper that resists the flexibility of the second step when the stepladder is needed. The handles are adjustable for wheelchair and wheeled walker functions.



Commercialisation Potential

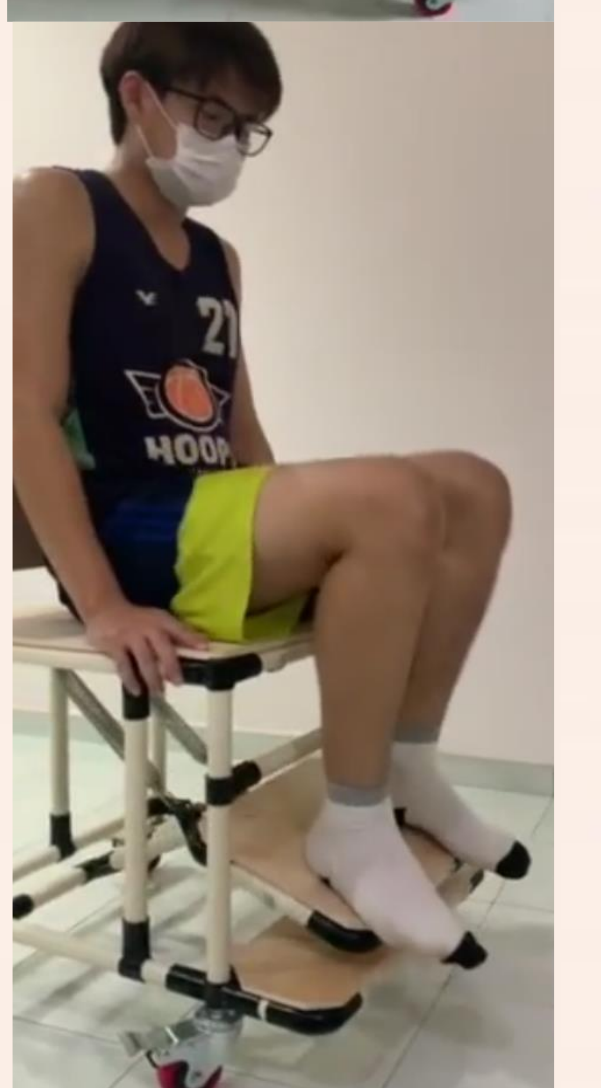
This invention is at its 3rd stage of technology readiness level (TRL 3).

Target/Relevant market segments include:

- Manufacturers of assistive devices (Assistive Technology, Honda, Panasonic).
- Manufacturers of stepladders (Louisville and Werner, Gorilla and Little Giant).

Market worth:

- Competitor products include single function devices such as stepladders, walking aids, wheelchairs, and Pilates chairs, which accumulatively cost around RM 2000 to RM 3000.
- With mass production, our invention price can be reduced to about RM 900 (with considerations of break-even analysis).



IP, Awards, and Recognition

- Patent:** Filing is in process (Letter of intent is attached in drive)
- Publication:** A paper write-up for a Scopus-indexed journal is underway (project report is attached in drive)

Novelty

There has yet to be a **cost-effective** device in the market applying a combination of **multifunctionality** and **modularity** concepts.

Gan, Ng, and Liew

