# Pulley System

Tuesday, September 16, 2025   4:15 PM

(first copy of plan)

Plan For Pulley Project

1. Create a blueprint of pulley with free-body diagrams

2. Establish my givens + what I'll be looking for

3. Create models of system + masses on inventor

4. Print models

5. Weigh and measure components of system, Calculate for time it takes for lighter mass to come up

6. Run system, measure actual time

7. Compare actual and theoretical time and % error
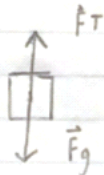
1st demo for system

1st demo for system

(heavier mass)
Mass 1   Mass 2   (lighter mass)
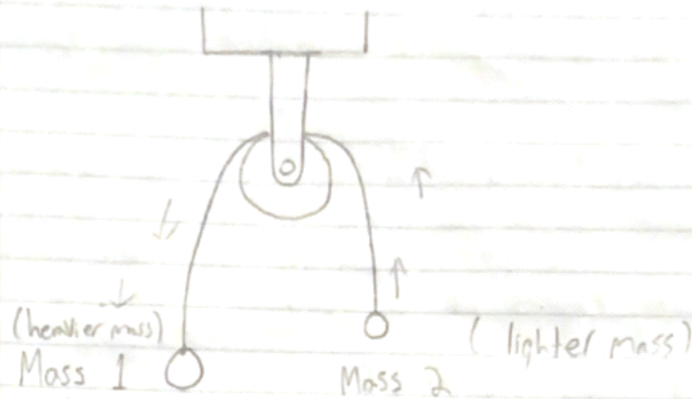
Looking for:
Acceleration ($\vec{a}$)
Force of tension ($\vec{F_T}$)
And eventually time (Δt)

Mass 1 (bigger/heavier mass)   Mass 2 (smaller mass)

$\vec{F_T}$ $\vec{F_T}$

$\vec{F_g}$

$\vec{F}_{Net} = M\vec{a}$ $\vec{F}_{Net} = M\vec{a}$
$\vec{F}_{Net} = \vec{F_g} - \vec{F_T}$ $\vec{F}_{Net} = \vec{F_T} - \vec{F_g}$
$M\vec{a} = \vec{F_g} - \vec{F_T}$ $M\vec{a} = \vec{F_T} - \vec{F_g}$

Final Eqn: Final Eqn:

$\vec{F_T} = \vec{F_g} - M\vec{a}$ $\vec{F_T} = \vec{F_g} + M\vec{a}$
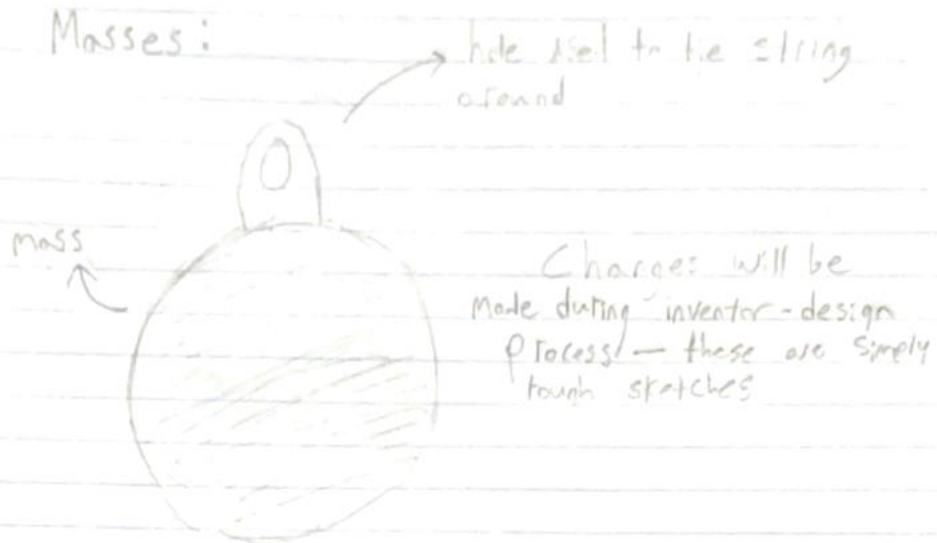
Specific Models used in system

Masses: → hole used to tie string
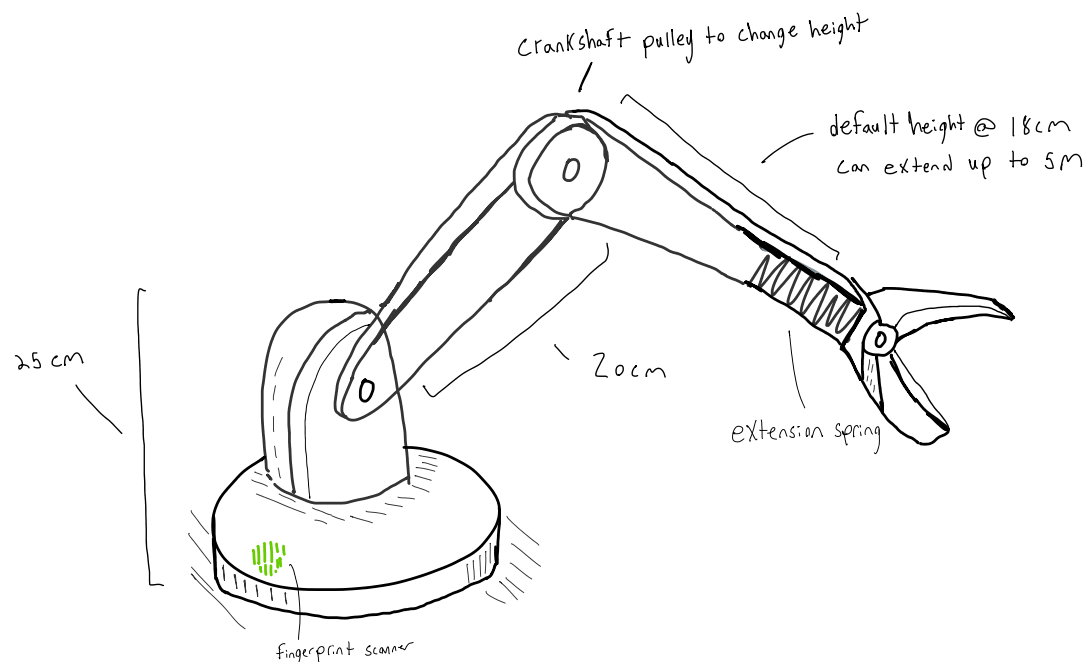   around

Specific Models used in system

Masses:

→ hole used to tie string around

← mass

Change: will be made during inventor-design process — these are simply rough sketches

Top of Pulley

→ latches that will attach to table or surface

→ rotating circle will be clamped on its sides

→ String placed on rotating circle/pulley system

Ai Mechanical arm

Crankshaft pulley to change height

default height @ 18cm
Can extend up to 5m

25 cm

20cm

extension spring
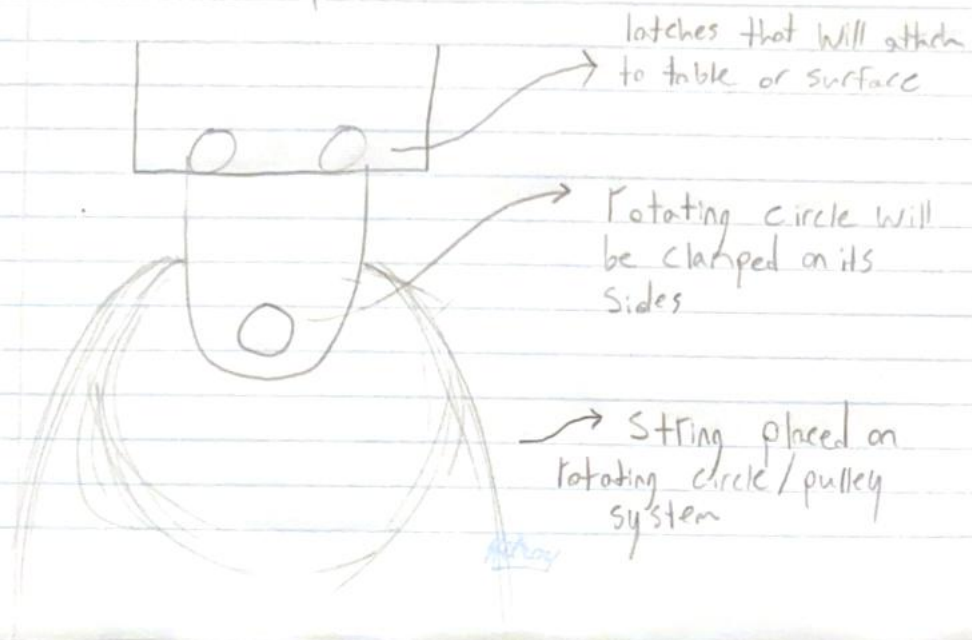
fingerprint scanner

- includes fingerprint scanner for authentication
- extendable
- Will grab anything within 5m
- powered and operated by voice commands