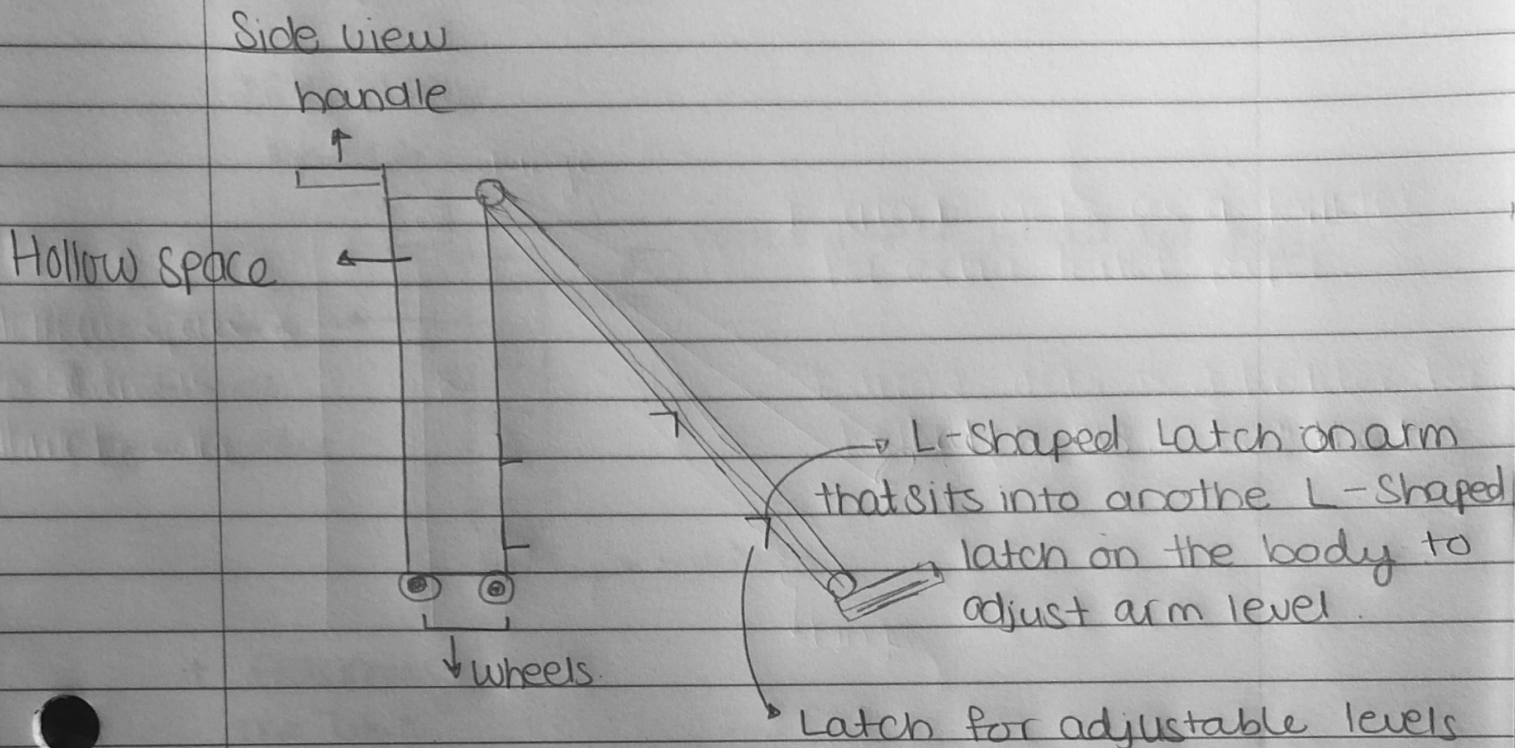


Concept 1.2

The toilet paper holder for the elderly.



Assuming

$$+ m = 20 \text{ lbs} \quad g = 9.8 \text{ m/s}^2$$

$$L = 15' \text{ in}$$

$$+ F = mg$$

$$F = (20 \text{ lbs})(9.8 \text{ m/s}^2) = 196 \text{ N}$$

length of retractable arm

$$+ T = F \cdot L = (196 \text{ N})(15' \text{ in}) = 2940 \text{ N} \cdot \text{in}$$

torque of retractable arm