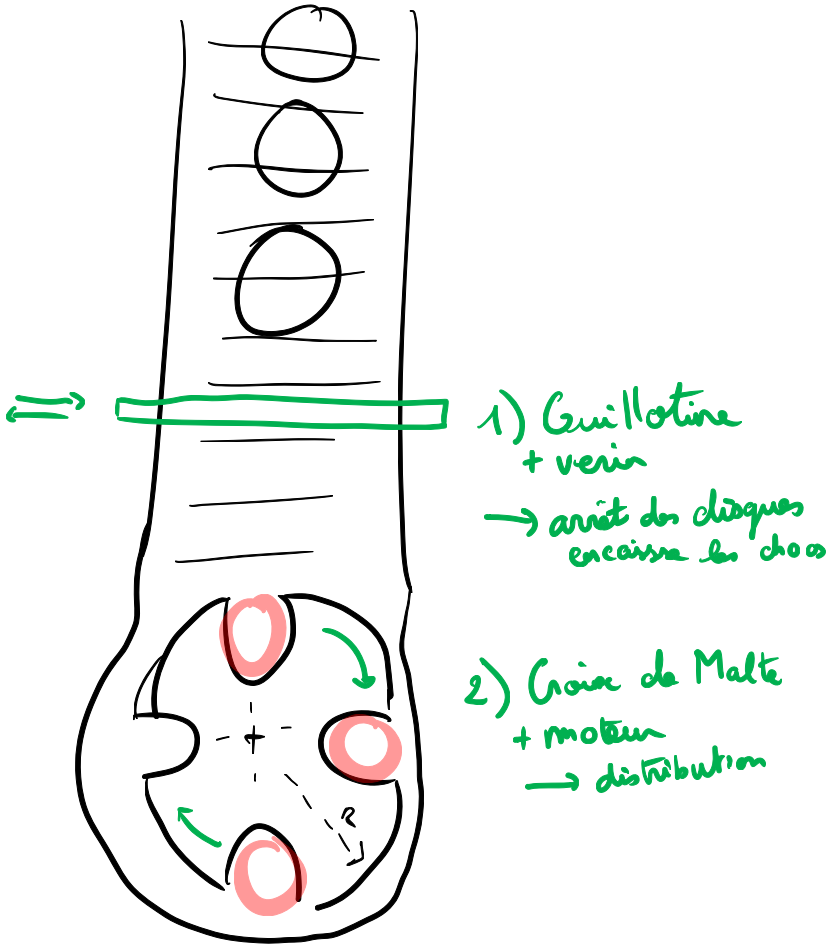
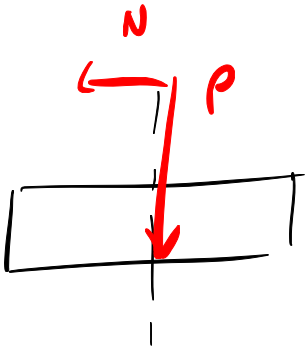
Distribution et arrêt :

1) Croix de malte



1.a) Couple moteur croix de malte



f : acier / acier

$$C_m = 3 \times R \times N$$

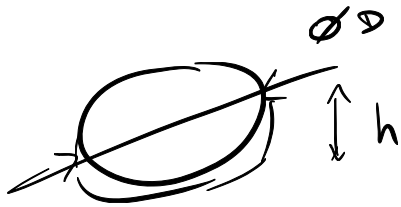
$$= 3 \times R \times P \times f$$

$$C_m = 3 \times R \times mg \times f$$

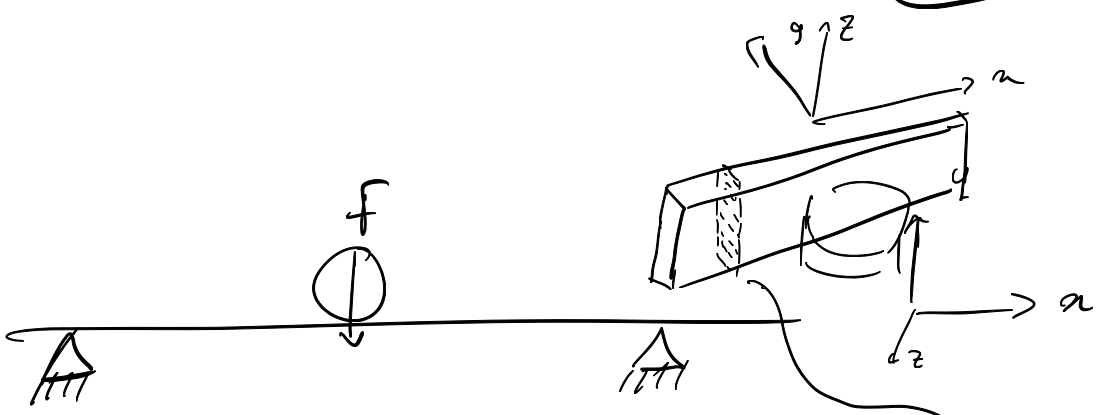
↳ $C_{m\,total} = C_m + C_{m\,pièce}$

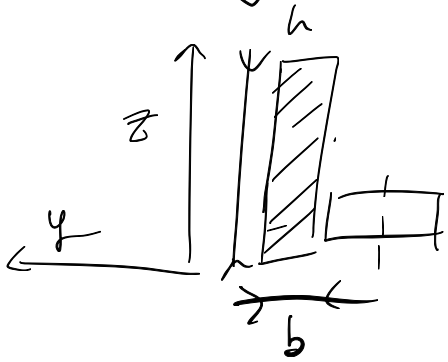
C_m pièce $\Rightarrow$ $J\dot{\omega} = C_m$.

J = cylindre



1b)





arrêt en 0,2s $\rightarrow$ $a = 8\,m/s^2$

$f = 30\,N$

$$y = \frac{PL^3}{48 E I_{Gn}} = \frac{F D^3}{48 E_{acier} I_{Gn}}$$

$$I_{Gn} = \frac{hb^3}{12}$$

$=$

$$y = \frac{30 \times 180^3 \times 12}{48 \times 210 \times 10^3 \times 50\, b^3}$$

$$b = \left(\frac{30 \times 12 \times 180^3}{48 \times 210 \times 10^3 \times 50 \times 10} \right)^{1/3}$$

déformation max

$y = 10\,mm$

$$\boxed{b = 0{,}7\,mm}$$

$$M_f = \frac{PL}{4} = \frac{300 \times D}{4} = \frac{300 \times 180}{4} = 13'500\,N mm$$

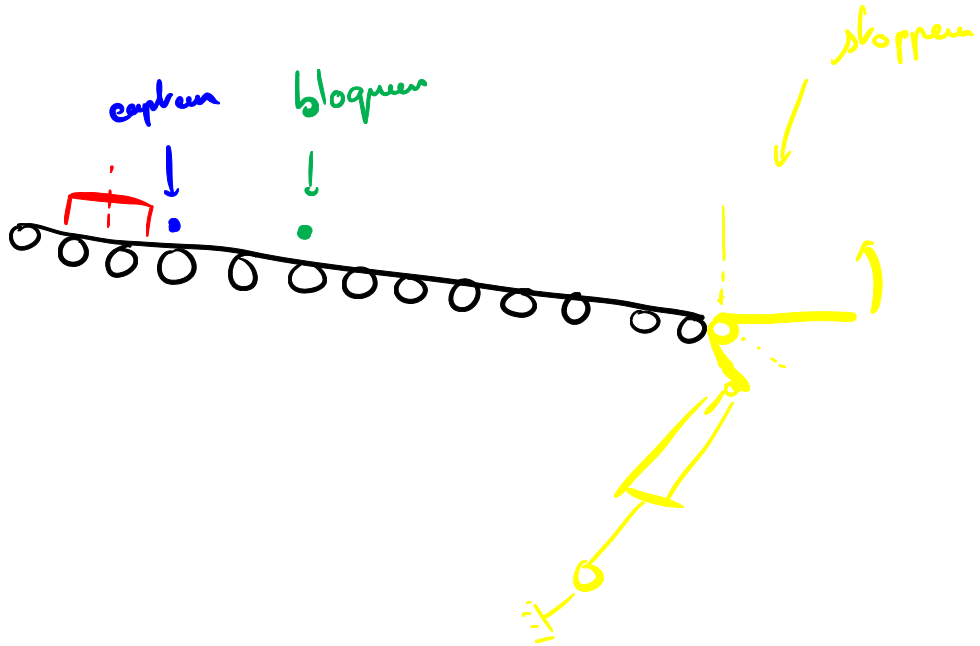
$$\sigma_{eq} \simeq \frac{My}{I_{Gx}} = \frac{13\,500}{50 \times h^3} \times 12 \times \overset{3}{\downarrow} 3$$

$$h = \left(\frac{13500 \times 12 \times 3}{50 \times 250} \right)^{1/3}$$

$$h = 3{,}38 \text{ mm}$$

---

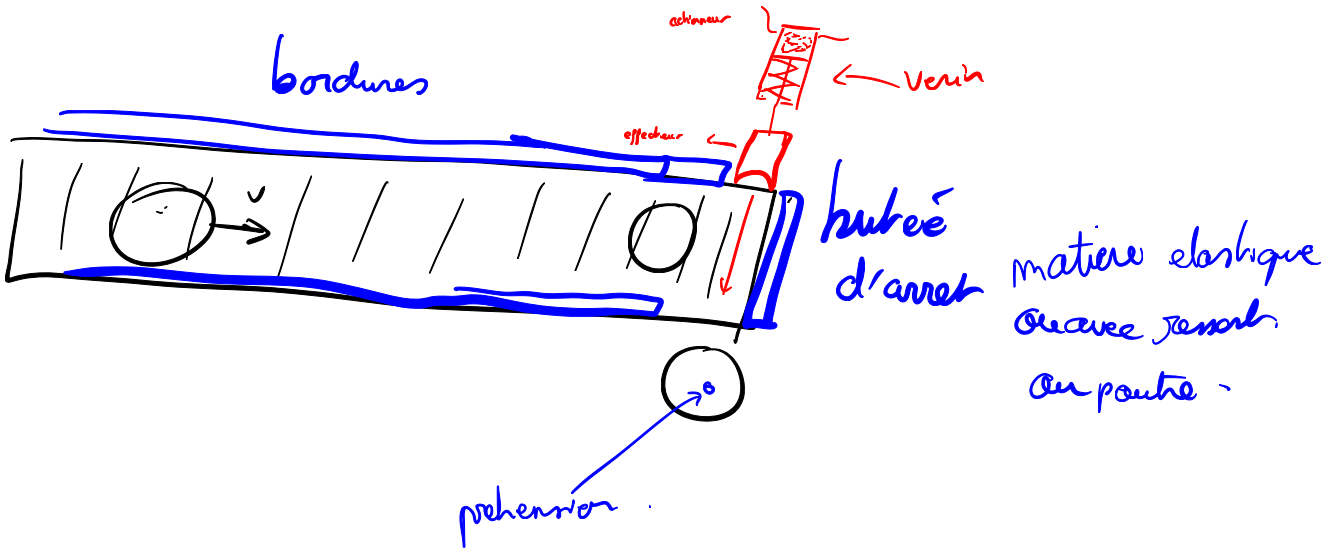
2) Solution vérin + bloqueur

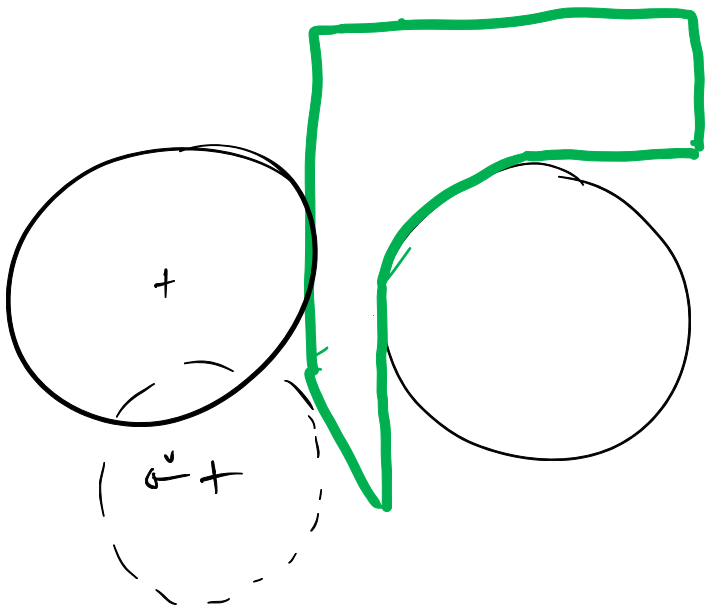


Calculs : cf autre document.

---

3) Solution "Pilulier"



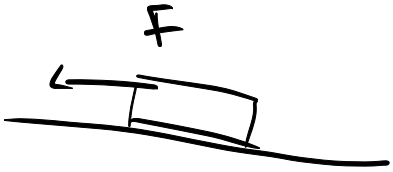


Si l'effecteur est guidé tout le long il n'y a pas d'effort radial sur le vérin

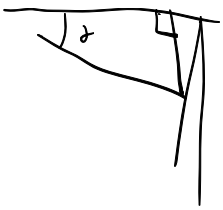
→ Calcul de l'effort pour faire remonter la pile de disques.

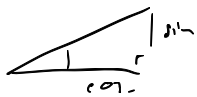
$m = 10$ unité $\Rightarrow P = 100 \times 3 = 300\,N$

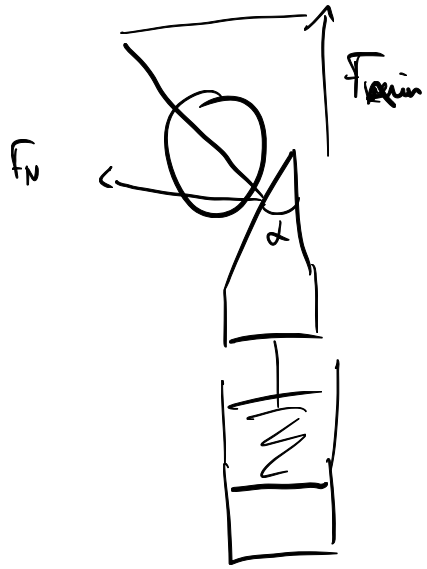
hyp Sans frottements.



$$F = P_x \sin(\gamma)$$
$$= 300 \times \sin(2{,}9°)$$
$$= 15\,N.$$







$$F_N = F_T \cos(\alpha)$$

$$F_T = \frac{F_A}{\sin(\alpha)}$$

$$F_N = \frac{\cos}{\sin}(\alpha)\ F_a$$

$$\boxed{F_N = \frac{1}{\tan(\alpha)} F_A}$$

plage 9 previous

→ Par simplicité je préférerais prendre cette solution car il n'y a qu'un seul actionneur.

T'en penses quoi ?