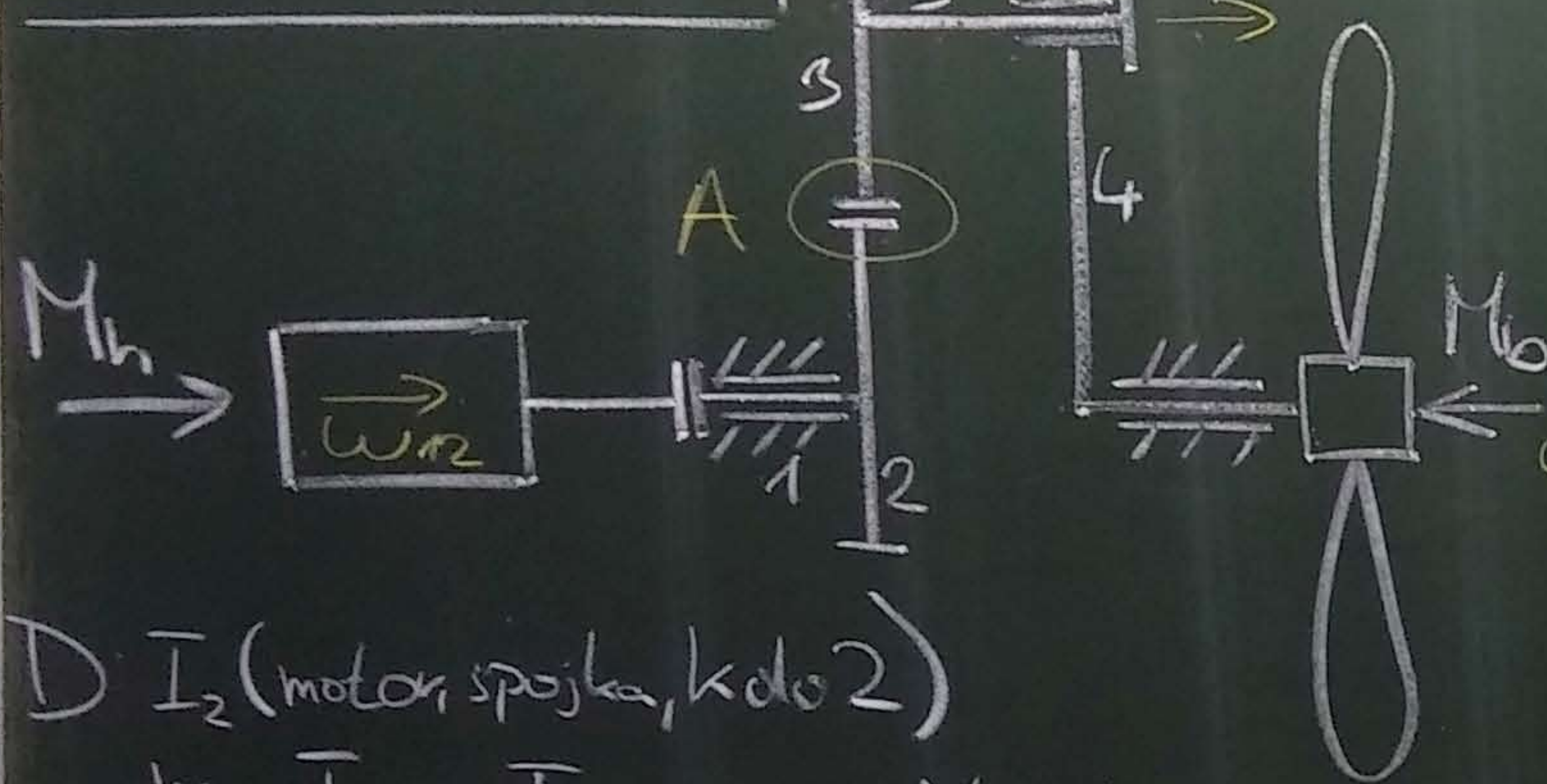


$$I_{red} \ddot{q} + \frac{1}{2} \frac{dI_{red}}{dq} \dot{q}^2 = Q$$



D I_2 (motor, spojka, kolo 2)
 $m_3, I_{3S_3}, I_4, r_2, r_3, M_h, M_b$

U VPR

$$\frac{1}{2} I_{red} \dot{q}^2 = \frac{1}{2} I_2 \omega_{12}^2 + \frac{1}{2} I_4 \omega_{14}^2 + \frac{1}{2} I_{3S_3} \omega_{13}^2 + \frac{1}{2} m_3 v_{153}^2 \quad ; \quad \dot{q} = \omega_{12}, \quad '13' = '14' + '43'$$

A. $N_{12} = N_{13} \rightarrow \omega_{12} r_2 = \omega_{14} r_2 - \omega_{43} r_3 \rightarrow \omega_{12} r_2 = \omega_{14} 2(r_2 + r_3) \Rightarrow \omega_{14} = \omega_{12} \frac{r_2}{2(r_2 + r_3)}$
 B. $\phi = N_{13} \rightarrow \phi = \omega_{14} (r_2 + 2r_3) + \omega_{43} r_3$

$$N_{153} = \omega_{14} (r_2 + r_3) = \omega_{12} \frac{r_2}{2(r_2 + r_3)} (r_2 + r_3) = \omega_{12} \frac{r_2}{2}$$

$$\omega_{12} r_2 = \omega_{13} 2r_3 \rightarrow \omega_{13} = \omega_{12} \frac{r_2}{2r_3}$$

$$\frac{1}{2} I_{red} \omega_{12}^2 = \frac{1}{2} I_2 \omega_{12}^2 + \frac{1}{2} I_4 \omega_{12}^2 \left(\frac{r_2}{2(r_2 + r_3)} \right)^2 + \frac{1}{2} I_{3S_3} \omega_{12}^2 \left(\frac{r_2}{2r_3} \right)^2 + \frac{1}{2} m_3 \omega_{12}^2 \frac{r_2^2}{4}$$

$$\left[I_{red} = I_2 + I_4 \left(\frac{r_2}{2(r_2 + r_3)} \right)^2 + I_{3S_3} \left(\frac{r_2}{2r_3} \right)^2 + m_3 \frac{r_2^2}{4} \right] = konst. \rightarrow \frac{dI_{red}}{dq} = 0$$

$$Q \dot{q} = M_h \tilde{\omega}_{12} - M_b \tilde{\omega}_{14} \rightarrow Q \tilde{\omega}_{12} = M_h \tilde{\omega}_{12} - M_b \tilde{\omega}_{12} \frac{r_2}{2(r_2 + r_3)} \rightarrow Q = M_h - M_b \frac{r_2}{2(r_2 + r_3)}$$

$$\boxed{I_{red} \dot{\omega}_{12} = M_h - M_b \frac{r_2}{2(r_2 + r_3)}}$$