$$\ddot{y}_M = 0 \qquad (6)$$

Infine $\Delta x_M = \Delta x_m \Rightarrow$

$$\ddot{x}_M = \ddot{x}_m \qquad (7)$$

Uso (5) - (7) in (4): $\ddot{x}_M = a$

$$\begin{cases} M a = F_m + 2F_{fM} & (i) \\ 0 = -Mg + F_t - F_{fM} & (ii) \\ m a = -F_m & (iii) \\ 2 m a = -mg + F_{fM} & (iv) \end{cases} \qquad (8)$$

Incognite: a, F_m, F_{fM}, F_t

4 Eqn ! $\Rightarrow$ soluzioni:

$$(M + m)\, a = -2 F_{fM} \quad (\text{da } (i) + (iii)) \qquad (v)$$

$$4ma = -2mg - (M+m)\, a \quad (\text{da } 2(iv) + (v))$$

$$(5m + M)\, a = -2mg$$

$$\boxed{a = \frac{-2mg}{5m + M}} \qquad (9)$$

$$F_{fM} = \frac{-4m^2 g}{5m + M} + mg = \frac{(-4m^2 + 5m^2 + mM)\, g}{5m + M}$$

$$\boxed{F_{fM} = mg\, \frac{m + M}{5m + M}} \qquad (10)$$