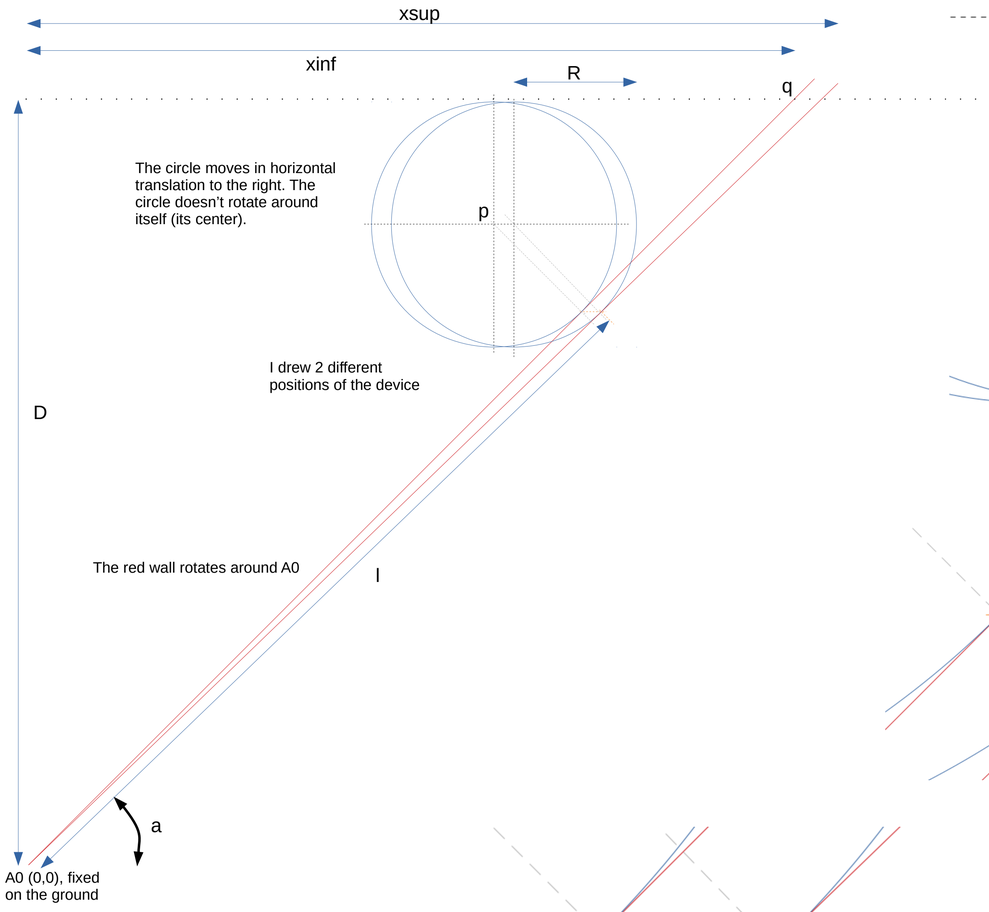
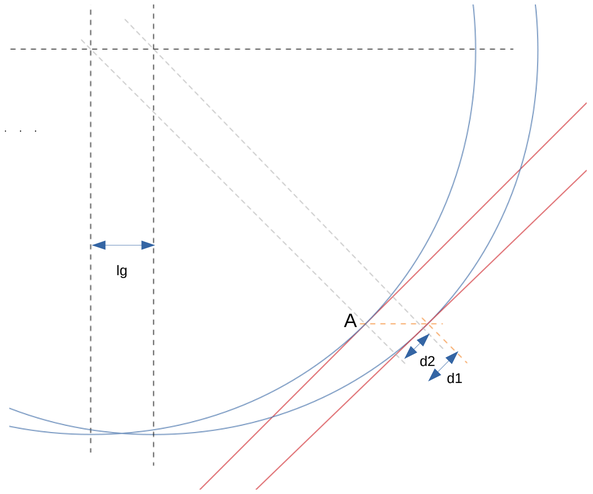
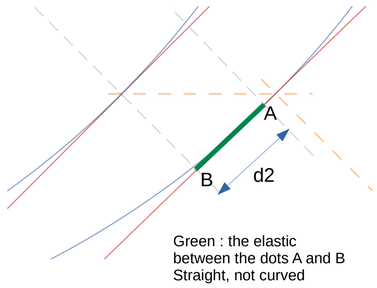
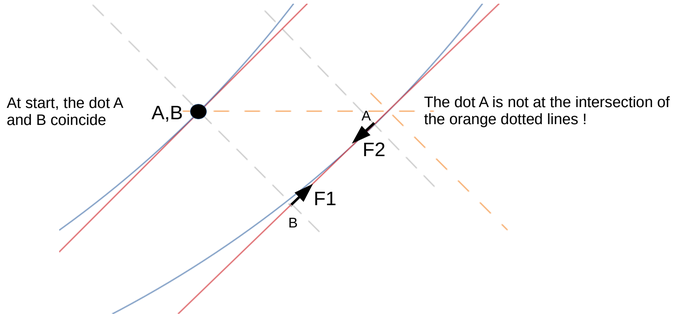
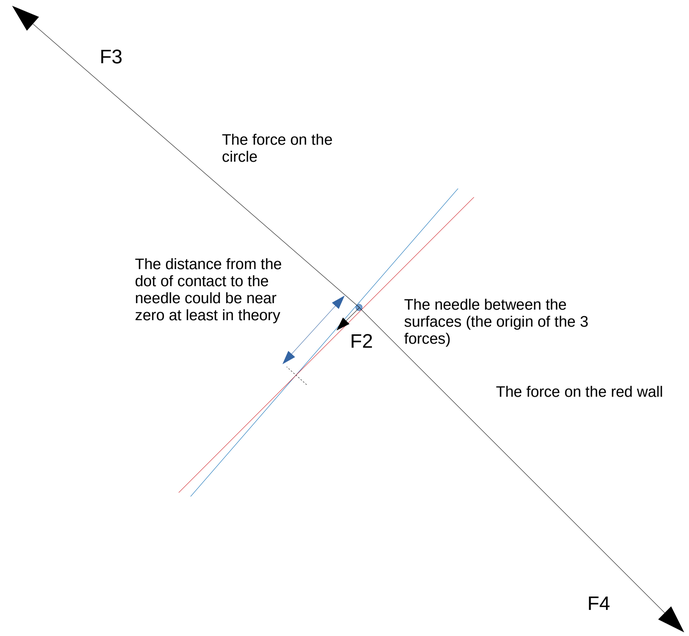
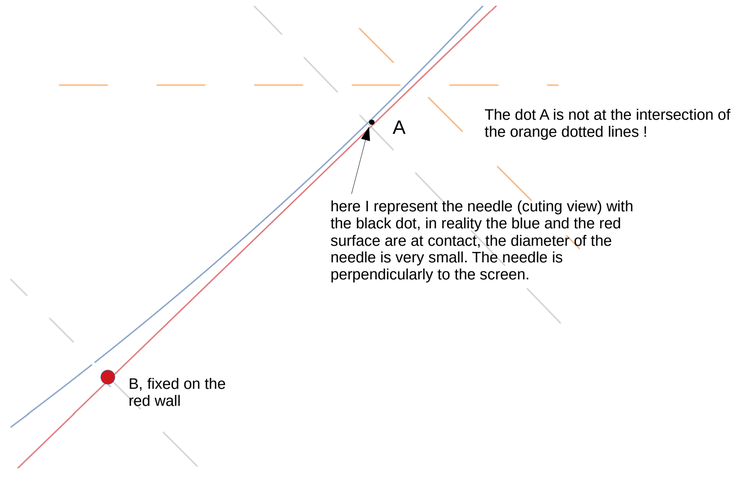

xsup
xinf
R
q
p
The circle moves in horizontal translation to the right. The circle doesn't rotate around itself (its center).
I drew 2 different positions of the device
D
The red wall rotates around A0
l
a
A0 (0,0), fixed on the ground


lg
A
d2
d1


A
B
d2
Green : the elastic between the dots A and B Straight, not curved


At start, the dot A and B coincide
A,B
A
F2
F1
B
The dot A is not at the intersection of the orange dotted lines !


F3
The force on the circle
The distance from the dot of contact to the needle could be near zero at least in theory
F2
The needle between the surfaces (the origin of the 3 forces)
The force on the red wall
F4


A
The dot A is not at the intersection of the orange dotted lines !
here I represent the needle (cuting view) with the black dot, in reality the blue and the red surface are at contact, the diameter of the needle is very small. The needle is perpendicularly to the screen.
B, fixed on the red wall