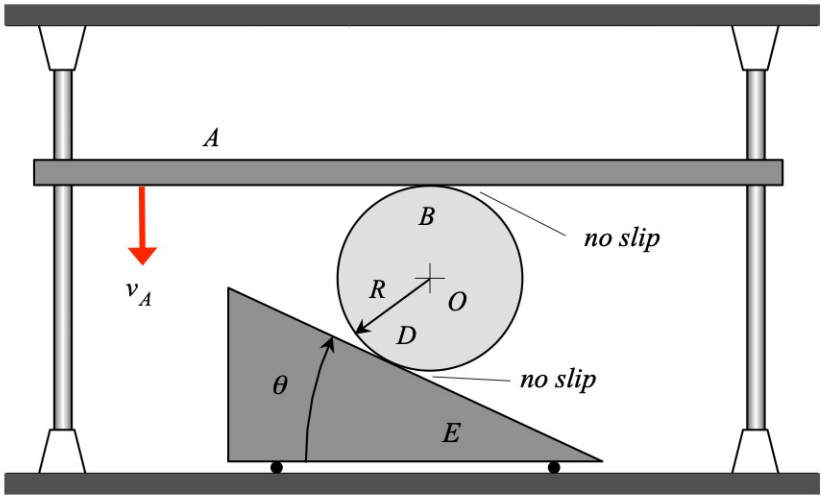
Homework H.2.G

Given: Wedge E, having an incline angle of θ, is constrained to move along a horizontal surface. A disk having an outer radius of R is able to roll without slipping on the incline of the wedge. Bar A is constrained to move in the vertical direction by two parallel guides. This bar is brought into contact with the top surface of the disk, with the disk being able to roll without slipping on the bar. The bar is given downward motion with a speed of v_A. Assume that the wedge and disk, as well as the disk and bar, remain in contact for all time.

Find: For this problem:

(a) Determine the location of the instant center for the disk.

(b) Determine the speed of the wedge E.



Use the following parameters in your analysis: $\theta = 36.87°$, $R = 0.5$ m and $v_A = 10$ m/s.

Homework H.2.H

Given: The mechanism shown is made up of rigid links OA, AB and CD. Link OA has a pin joint at end O and is known to be rotating in the clockwise sense about O with a rotation rate of ω_{OA}. AB is pinned to OA at end A and is pinned to a slider at B, with B moving along a horizontal guide. Link CD connects the center C of AB to a second slider at D through pin joints, with this slider constrained to move along a vertical guide. At the instant shown link OA is oriented vertically, B is directly below D and D is directly to the right of A.

Find: For this problem:

(a) Locate the instant center (IC) for link AB. Based on the location of this IC, what is the speed of pin C and the direction of travel for C, as well as the speed of slider B?

(b) Locate the IC for link CD. Based on this location, determine the speed of slider D.

NOTE: Please use only the instant center approach for this problem. Do not use vector analysis to find your answers.