**P7.4-5)** Packages travel on a smooth track that delivers them to a conveyor belt. Initially, the packages move along a flat section of the track and then proceed to a curved portion of radius r. Determine the minimum entry velocity to the curved portion (v_A) such that the packages will not start separating from the track until they reach position C. Also, calculate the acceleration of the packages at position B if the packages enter the curved section with the previously calculated minimum velocity. Determine v_A and $\mathbf{a}_B$ in terms of the radius (r) and the acceleration due to gravity (g).

P7.4-5
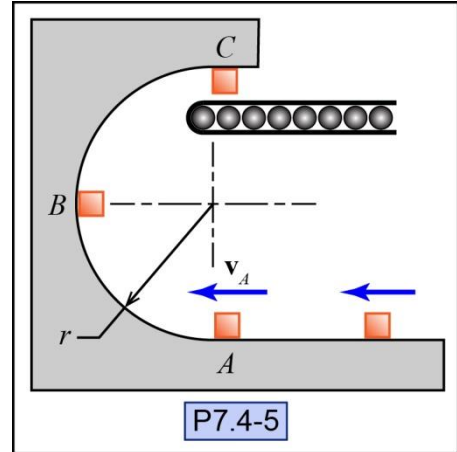
Given:

Find:

Solution:

Is this a conservative or non-conservative system?

Conservative   Non-conservative

Work-Energy Balance

Solve for the minimum speed of the package at position A.

$v_A =$ _____

Using the speed at position A, solve for the speed at position B.

$v_B =$ _____

Newton's Laws

Draw a free-body diagram of the package at position B.

Solve for the acceleration of the package at position B.

$a_A =$ _____