Computer Aids for Design - ME30043/MI50167

Assignment - Pusher Mechanism

**Introduction**

These notes are for the nssignment for the unit. This is the full assighment if you an undergradunte; There is an additional part given separately is you are an MSc student.

The assignment is concerned with the design of a "pusher mechanism". The aim is to take you through some of the typical design stages. These begin with an initial concept where the initial "stick geometry" for the mechanisin is obtained. The design is made more detailed by using a CAD system (Solid Edge) to generate the parts as 3D models and then to assemble and move these. Some analysis work is undertaken and some preparation for manufacture using rapid prototyping (RP) techniques.

Typically CAD systems are good at modelling geometry and moving this into forms suitable for manufacture. They are less good at supporting the conceptual phases of design and at handling (non-standard) analysis. For the assignment these parts can be undertaken using the constraint modelling software created at Bath. There is however no need to use this if you do not wish to and if you can find suitable alternative procedures.

The following sections firstly describe the underlying mechanism application. This is followed by section describing the assignment as a whole and then its individual parts. Finally the requirements for the assessment are given.

**Mechanism**

It is desired to obtain a pushing mechanism for moving a box into a labelling machine and then returning over the next waiting box. A horizontal pushing stroke is needed along the line y = 0 between x = 220 and x = 0 (dimensions here and elsewhere are in centimetres).

During the return, the pushing head should not enter the region where both x<80 and y > 70; and it should pass above the points (120, 80) and (220, 80). The figure shows an initial attempt at a schematic design.

The box is 80cm long (in the direction of travel), 60cm high, and 60cm wide (normal to the plane of the diagram).

