

Module 2 : Robots mechanisms

Lecture 6 : Manipulators Mechanisms-III

Objectives

In this course you will learn the following

- Concept of transmission angles in mechanisms
- Coupling of actuator motions
- RCC – accommodation of minor errors in alignment

Transmission Angle

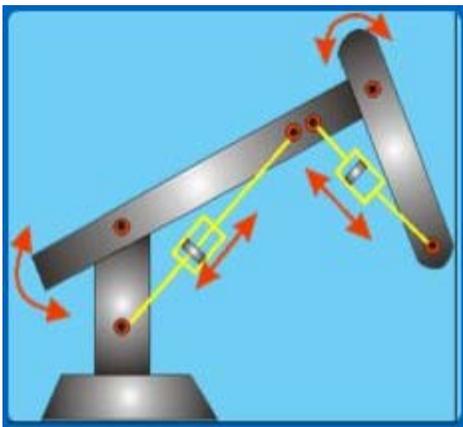


Fig 6.1.1

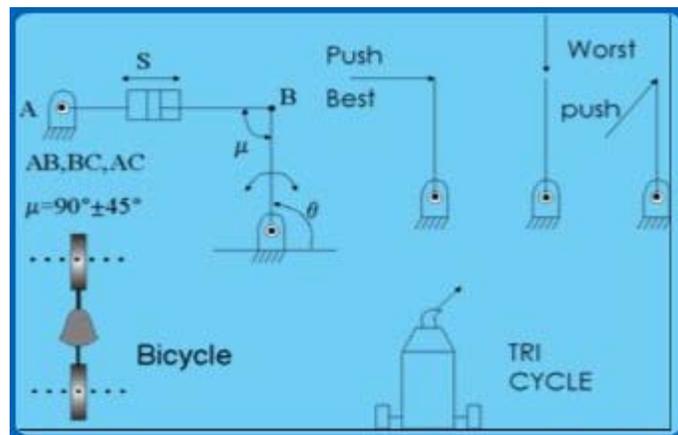


Fig 6.1.2

An example of rear pivoted cylinder mechanism. Fig 6.1.1.(above left). No side thrust arises between cylinder and piston.

Transmission angle of force: important from point of power transmission efficiency and this angle needs to be checked in mechanisms that are used in robot actuators. Fig 6.1.2.above shows the best and worst scenarios of transmission angle.

Coupling of actuator motions

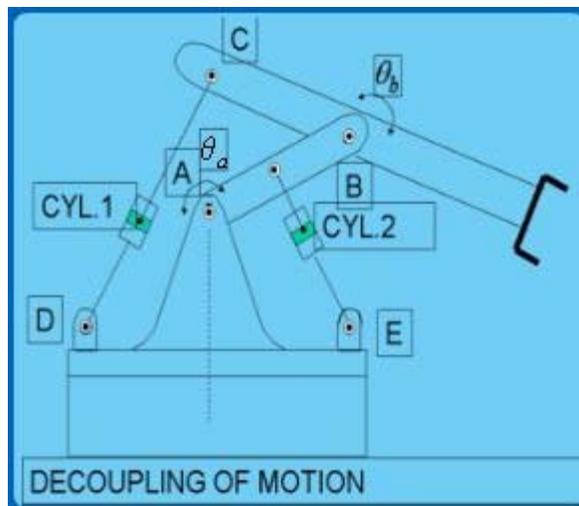


Figure 6.2.1

The mechanism shown in Fig. 6.2 has coupled motion unlike the one in 6.1.1. In the device in Fig. 6.2.1 assume Cyl 1 is locked, the motion of Cyl 2 affects both θ_a and θ_b . In Fig. 6.1.1 the motion of one actuator affects only one angle.

Grippers in manipulators

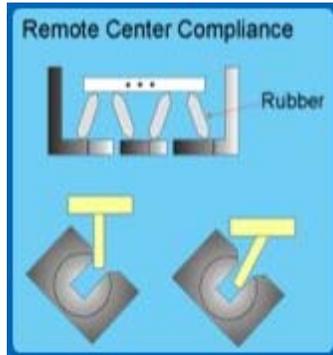


Figure 6.3.1

For assembly easiness RCC type elements are used between the gripper and wrist. (RCC stands for remote centre compliance.) The RCC consists of flexible elements which take care of small variation in position of End effector while executing an assembly as shown in figure 6.3.1.

Recap

In this lecture we have learny about

- Concept of transmission angles in mechanisms
- Coupling of actuator motions
- RCC – accommodation of minor errors in alignment

Congratulations, you have finished Lecture 6. To view the next lecture select it from the left hand side menu of the page