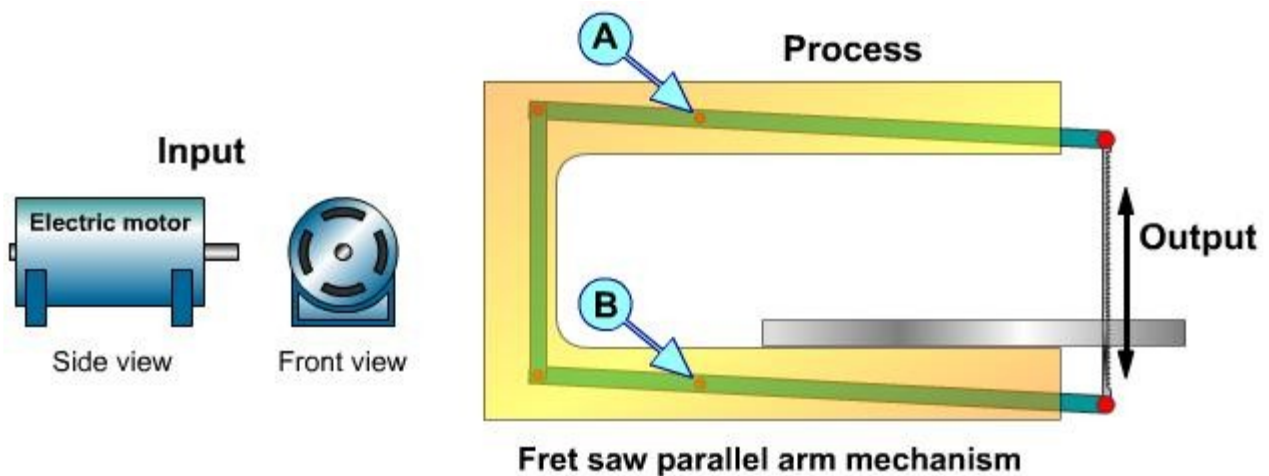


Problem Solving: Fret Saw Parallel Arm Mechanism



Introduction

A diagram of the linkage mechanism for a fret saw is shown above. The linkage mechanism will be driven by an electric motor. The linkage mechanism will convert the rotary motion output of the electric motor into a reciprocating motion of the fret saw blade.

Learning objective

To develop students' problem solving capability by guiding them through a mechanical systems problem.

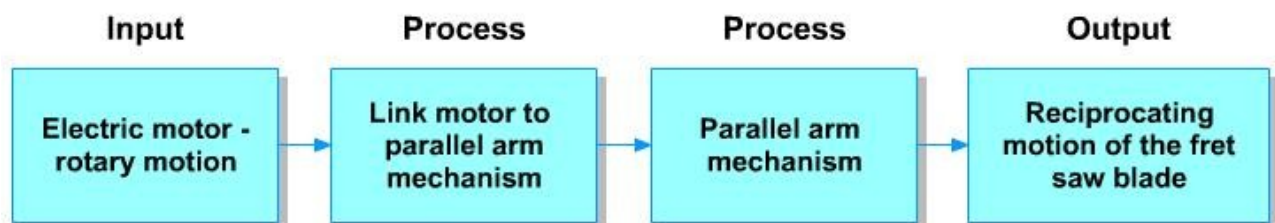
Design Brief

Devise a method of connecting the electric motor to the linkage mechanism and show how the rotary motion of the motor drives the linkage mechanism.

Problem Solving

The electric motor must drive the parallel arm mechanism somehow.

- Which type of mechanism would make the parallel arms oscillate about pivot A and pivot B (fulcrums)?
- How could the electric motor drive the mechanism?
- How could the motor, the linking mechanism and the parallel arm mechanism be joined?



What you must do

1. Analyse the problem so that you understand it fully.
2. Make a list of mechanisms that would make the parallel arm mechanism oscillate about pivot A and pivot B. Use notes and sketches to record your ideas.
3. Choose the mechanism that solves the problem the most effectively.
4. Show how the electric motor drives the mechanism.
5. Show how the motor, the linking mechanism and the parallel arm mechanism will be joined
6. Use notes and sketches to illustrate your best design.
7. Evaluate your design and modify it if necessary.

You may use research methods to find information about suitable mechanisms, e.g.

- product analysis
- library search / computer software search
- internet search
- experiments - model your ideas, e.g. using mechanisms kits
- interview - ask an expert.

Success criteria

You have:

- Analysed the problem and have worked independently and with others to find solutions to it.
- You have used research methods to find information.
- You have recorded ideas and your research findings.
- You have used your research and other ideas to develop a solution to the problem.
- You have produced an accurate drawing or model of your solution to the problem.
- You have evaluated your solution to the problem and modified it if necessary.