

**PROBLEM 1-2**

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**Statement:** A bowling machine is desired to allow quadriplegic youths, who can only move a joystick, to engage in the sport of bowling at a conventional bowling alley. Consider the factors involved, write a goal statement, and develop a set of at least 12 task specifications that constrain this problem. Then suggest 3 possible concepts to achieve the goal. Make annotated, freehand sketches of the concepts.

**Solution:**

Goal Statement: *Create a means to allow a quadriplegic to bowl.*

Task Specifications:

1. Cost no more than \$2 000.
2. Portable by no more than two able-bodied adults.
3. Fit through a standard doorway.
4. Provide no threat of injury to user in normal use.
5. Operate from a 110 V, 60 Hz, 20 amp circuit.
6. Be visually unthreatening.
7. Be easily positioned at bowling alley.
8. Have ball-aiming ability, controllable by user.
9. Automatically reload returned balls.
10. Require no more than 1 able-bodied adult for assistance in use.
11. Ball release requires no more than a mouth stick-switch closure.
12. Be simple to use with minimal written instructions necessary.

Concepts and sketches are left to the student. There are an infinity of possibilities.