Seeding bot using Firebird6

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Problem statement

To build a bot, that automatizes the entire **seed sowing** operation in a green house using Firebird6.

Requirement specification

Mechanism that dispenses one seed at a time

To ensure seeds are distributed evenly and there is no seed wastage

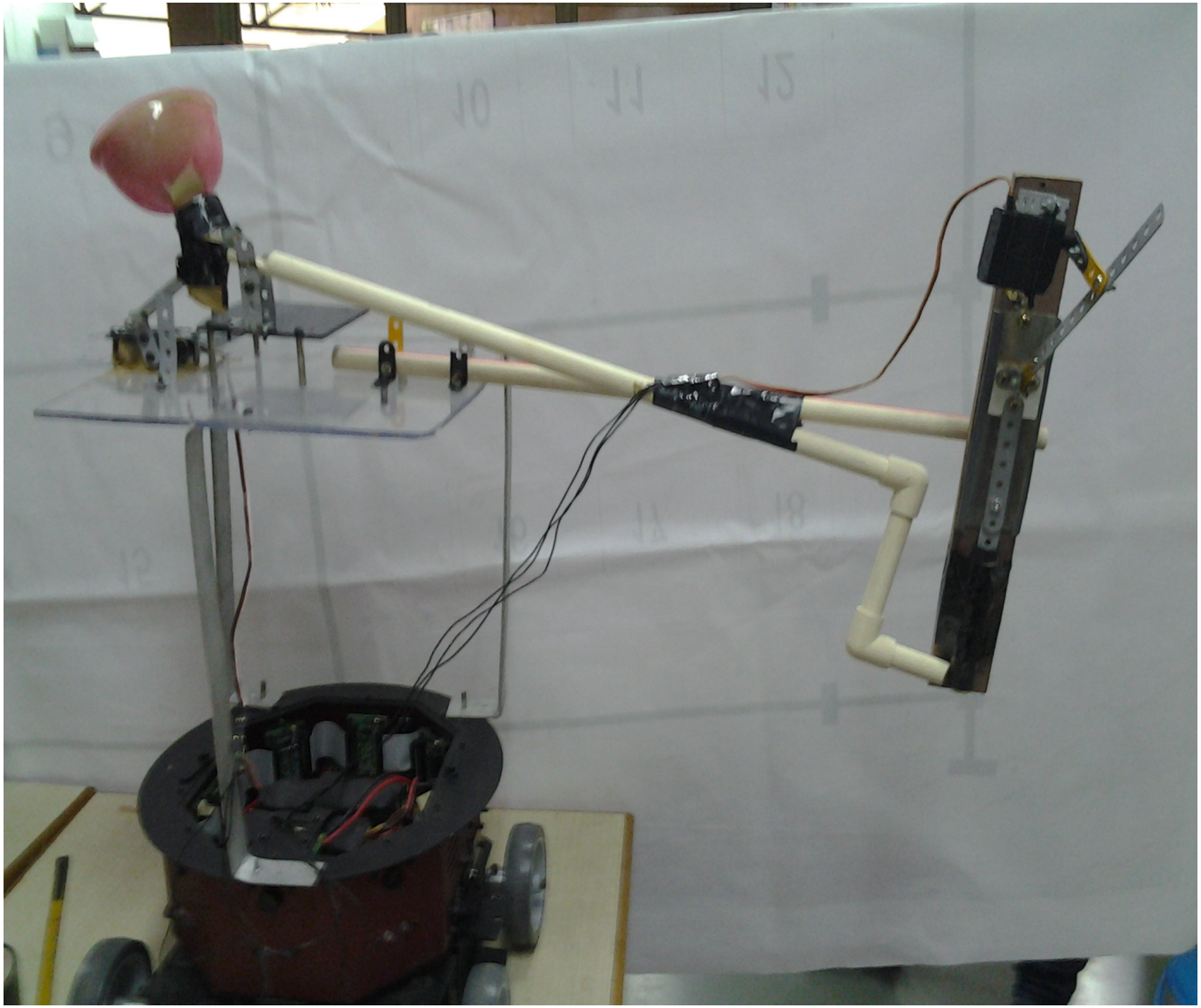
Mechanism that sows seeds under soil

To ensure that seeds germinate and are not eaten up by the intruders like rats.

A bot that moves in the green house as per its pattern

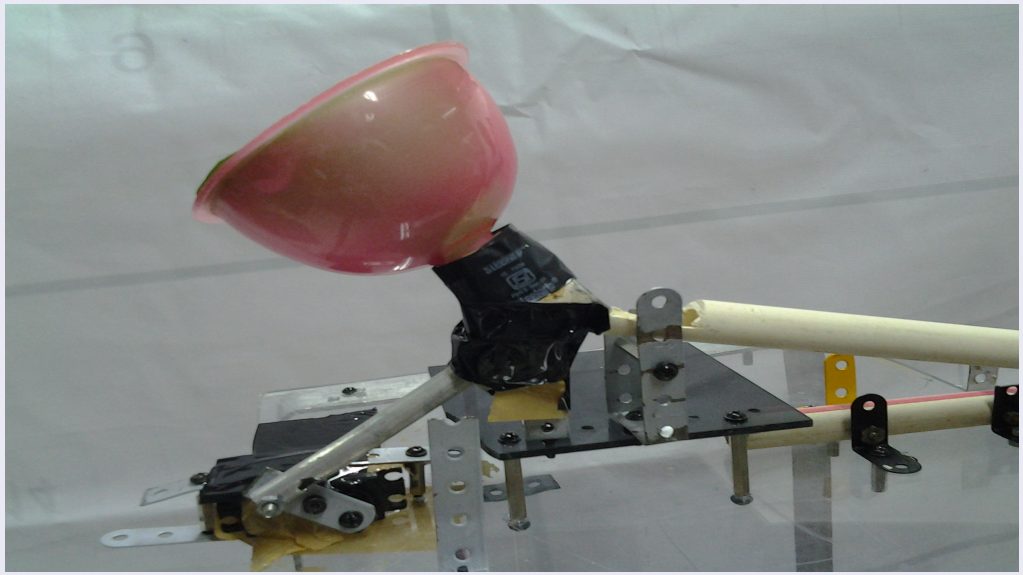
On which the above two mechanism can be mounted to achieve seeding in the green house.

Goals Accomplished



Goals Accomplished contd.

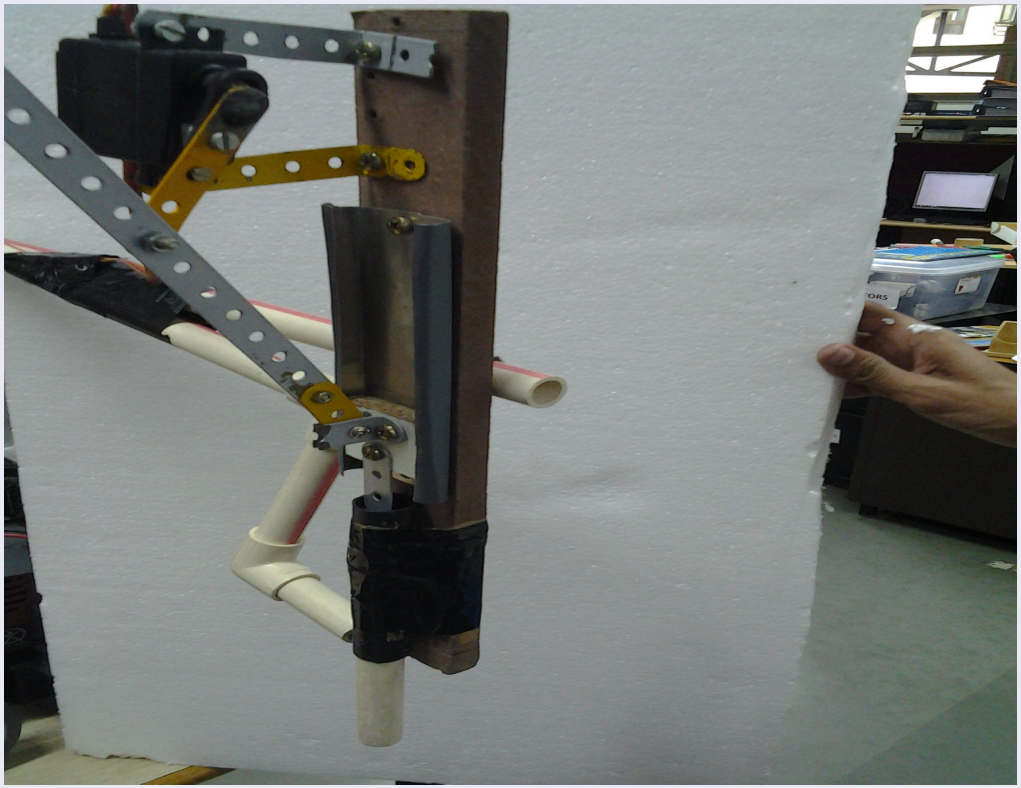
1. Mechanism that dispenses one seed at a time



- Seeds lined up one above the other.
- Bottom most seed faces a hole on one side from where it reaches the sowing pipe, and piston on the other side that pushes it in the sowing pipe.
- Bottom most seed is pushed and seeds above it shifts down to occupy the void created.

Goals Accomplished contd.

2. Mechanism that sows seeds under the soil



- Crank-shaft mechanism driven by servo motor that pushes the piston in the soil ones the seed is dispensed.

Goals Accomplished contd.

3. Perform seeding in the entire Green House

Current implementation can perform seeding in a striaght lines at fixed distance intervals.

Issues encountered

Seed dispensing

- Design a mechanical component to ensure, only one seed drops at a time.
- Desing a mechanical component to dig the hole using the crank shaft mechanism.

Ensuring that piston pushes the soil at correct location where seed drops

- We build the mechanism such that seed follows a guided straight line path and deviates least so that piston pushes at correct position.

Issues encountered contd.

Problems with **Firebird6**

- Learnt a new platform Firebird6 to employ it in use.
- Ultrasonic sensors having precision more than 2 inches, resulting in inability to use it for precise movement.
- Infrared sensors with very small range.
- If the speed is kept slow, the bot did not move because of its weight and if kept high it moves very fast, making it difficult to take a turn.

Insights Gained

- Designing mechanical components and running them using software.
- Learn their synchronization issues.
- Programming a robot, to get stuff done.
- Learnt Firebird6 and understood its goods and limitations.