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OVIPOST

Automated Cricket Harvester with Ovipost

Current Cricket Farming Practices

- Labour costs account for 60-80% of production expenses[1]
- Harvesting one bin of 2,000 crickets requires one labour hour of labour and 5-10% loss of product[2]
- Quantity is estimated by volume, yet sold by mass, costing the farmer profit and little data on farming practices[2]
- Rearing technologies have had little innovation and no automated rearing technology available for farmers to lower the market

Requirements

1. Shall collect 95% of the total live population in a separate and sealed reservoir and not collect more than 1% deceased crickets or 0.1% waste by weight
2. Shall not injure or kill more than 1% of the total live population, or cause stress that would reduce growth and breeding rates
3. Shall provide more value to labour relief than the cost of the device
4. Should count the separated crickets to 90% accuracy

Verification

1. Collected 91% crickets and no waste or dead crickets from the total volume.
2. Injured or killed 0.5% crickets in one operation cycle. An entomologist confirmed that the device does not introduce harmful stress to the crickets[3].
3. For a 10-minute cycle, the device harvests crickets 6 times faster than the manual method. For a farm harvesting 10,000 crickets per day and paying labor $15 per hour, the device sold at $5000 can be payed for in labor savings in 4 weeks[1].
4. Counted 100 crickets to 93% accuracy.

Sorting Crickets

1. All contents of bin are emptied into the hopper.
2. User pushes the start button.
3. Crickets migrate toward the opening and enter the tube.
4. Sliding door pushes waste through floor and crickets toward the exit.
5. Crickets slide down tube and are counted using computer vision
6. Crickets end in the self-sealing reservoir.
7. Trap door empties large waste pieces into the waste tray.
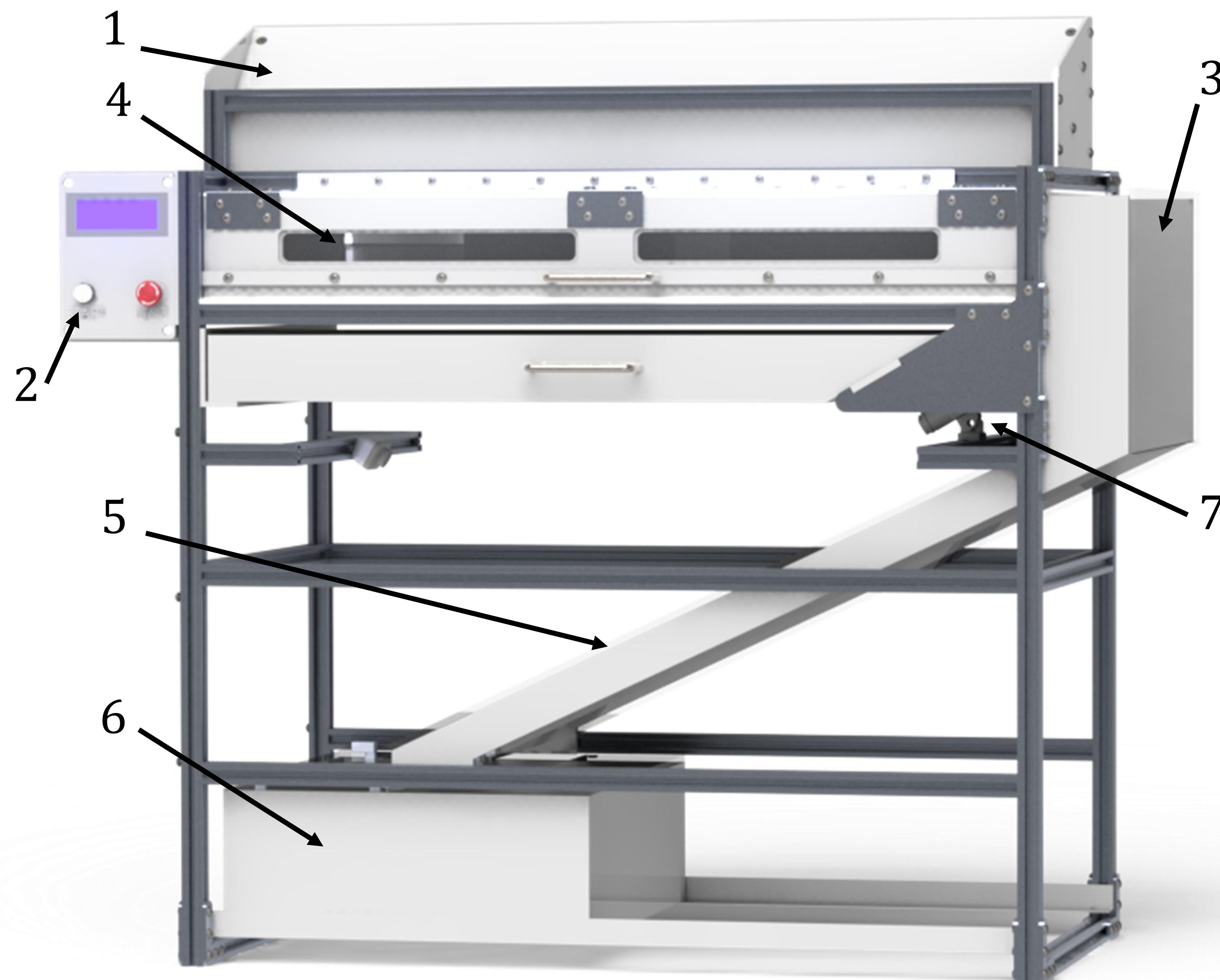
Counting Crickets

1. Video captures 40 fps of crickets in the tube for the full cycle duration.
2. Images are dilated to remove legs, antenna, and processed to binary format.
3. After cycle is complete, line counting algorithm counts crickets passing a threshold.
4. Final count is provided on LCD screen.
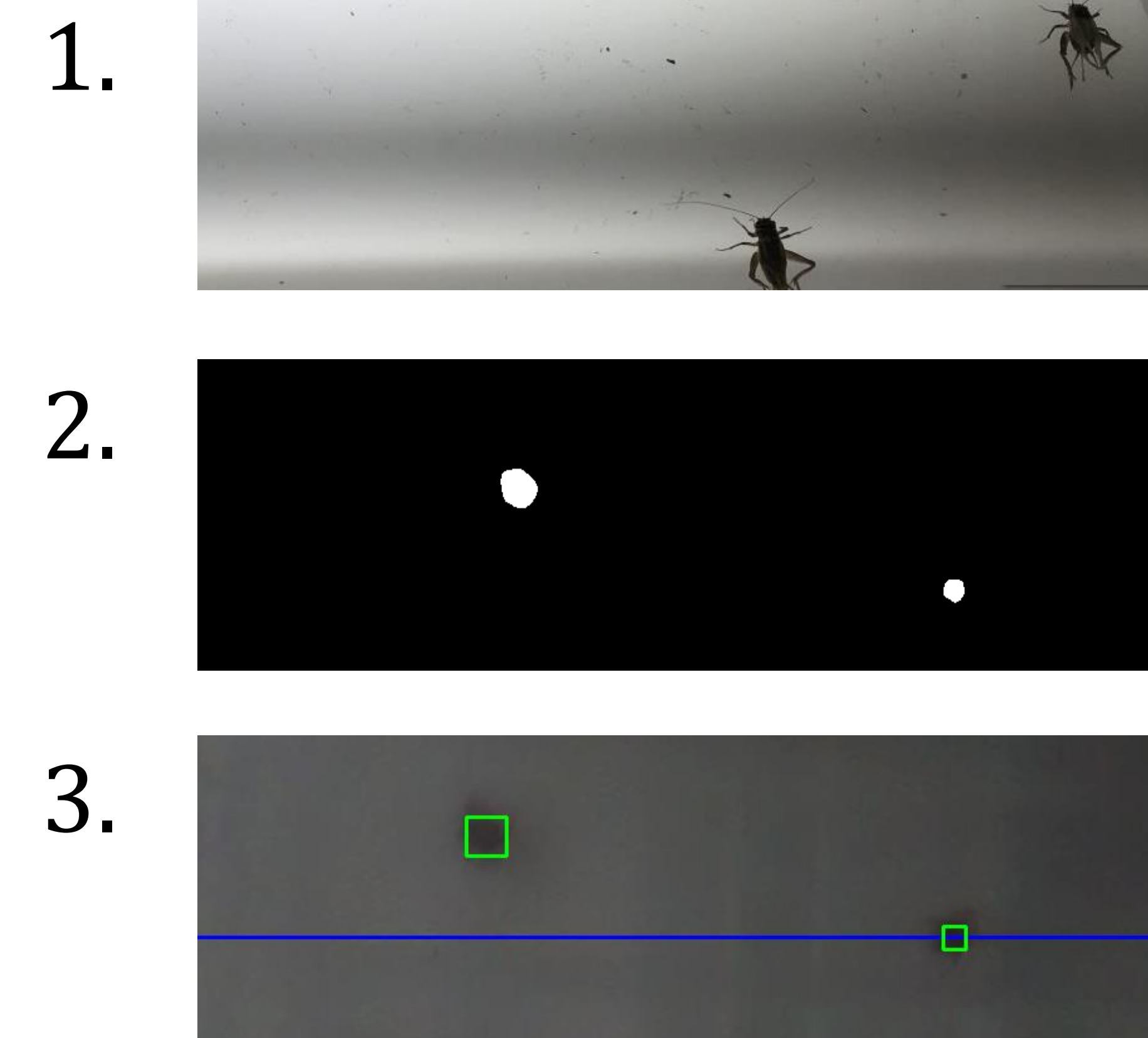
Design Features

- Capable of harvesting and counting up to 2000 crickets per 10 minute cycle.
- Uses two pneumatic actuators controlled by Arduino to power the slider and waste door.
- Can be routinely cleaned with moist cloth and occasionally washed down after removing electronics.
- Constructed with all food-grade cricket friendly materials[3]

References
All images taken or produced by the design team from Sept 2017 to March 2018
1. Trina Chiasson, Ovipost, interview. Sept 20, 2017
2. Andrew Brentano, Rocky Mountain Tiny Farms, interview. Oct 13, 2017
3. James Ricci, Ovipost, interview. Mar 18, 2018.

PATENT PENDING