Project Deliverable E Conceptual Design

Group 1

GNG 1103 – Engineering Design

Faculty of Engineering – University of Ottawa

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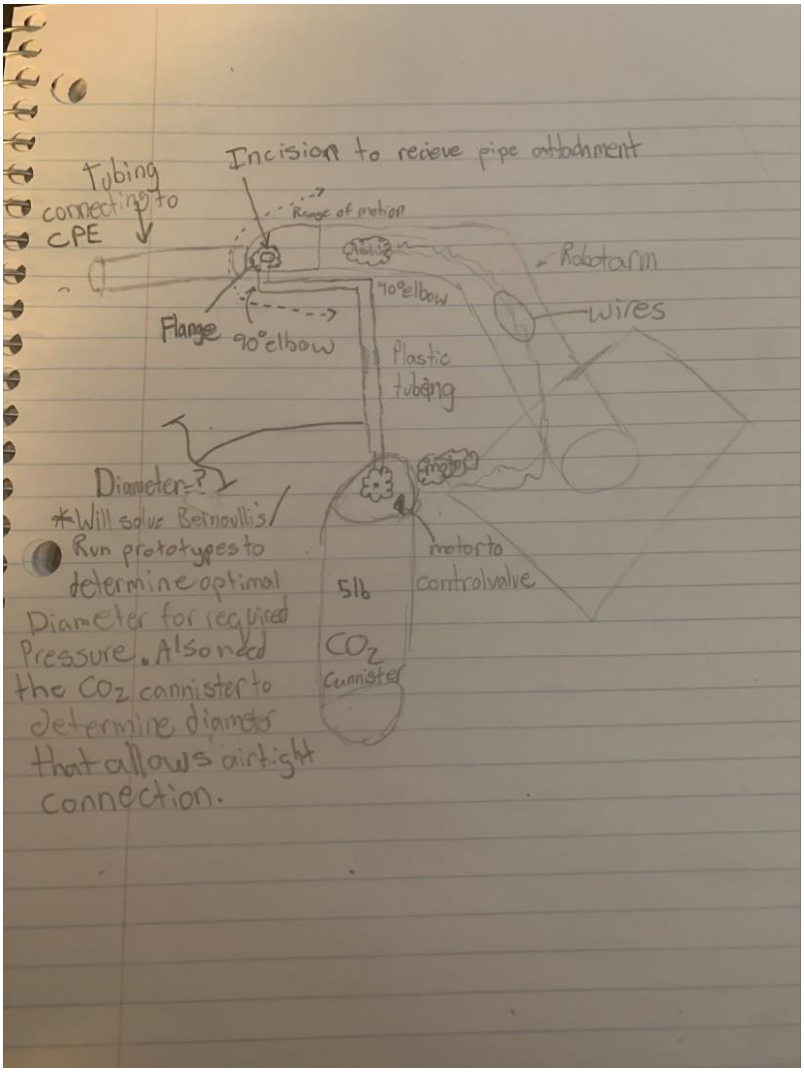
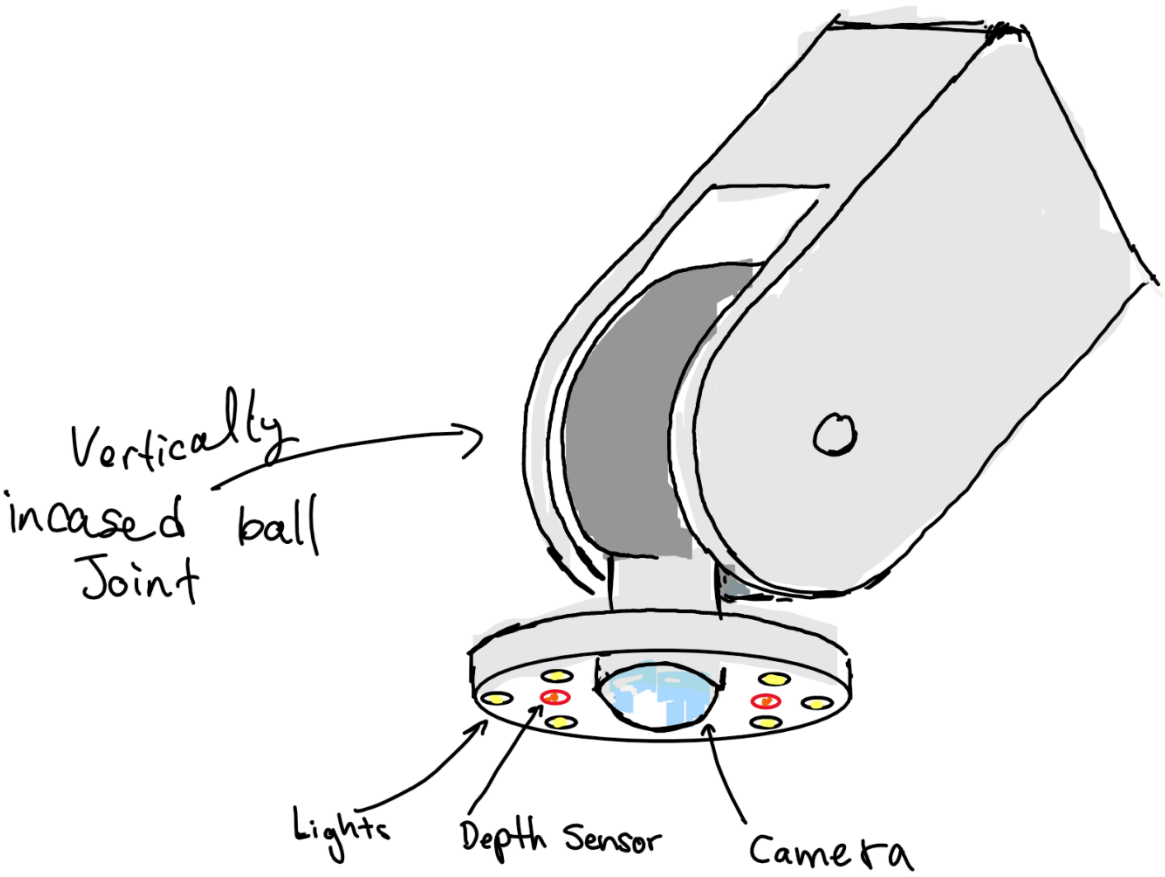
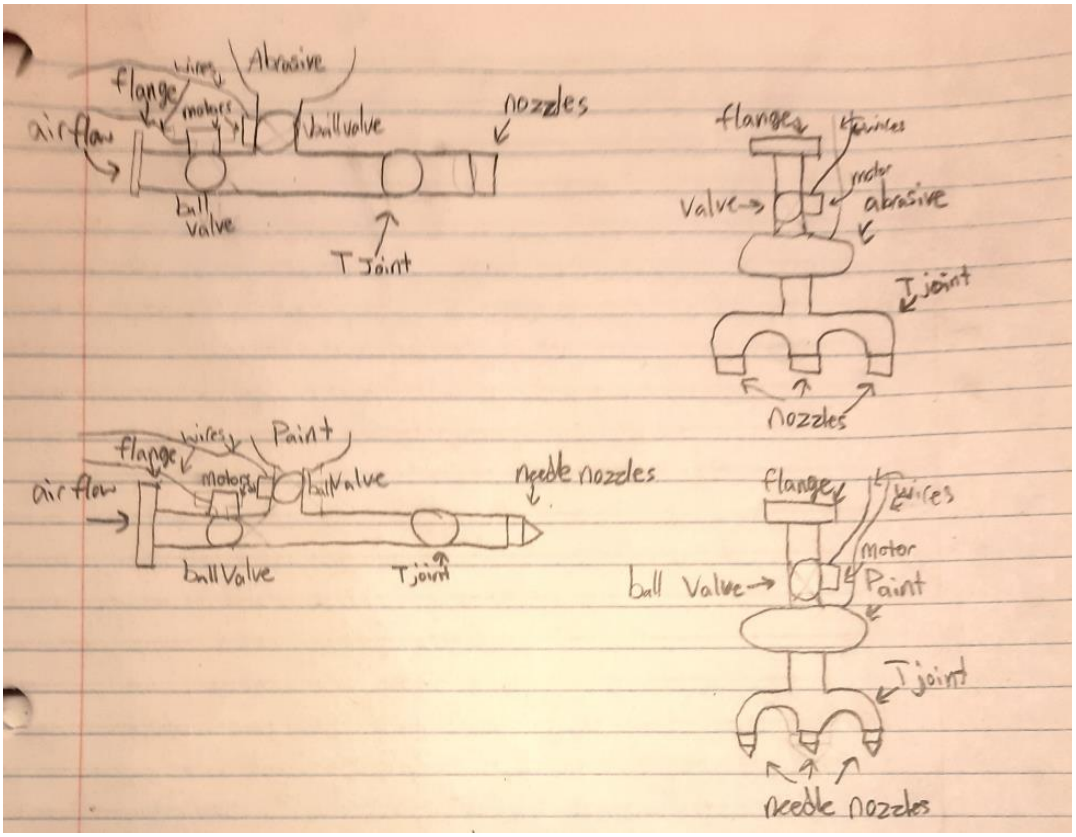
Detailed design drawings




Vertically
incased ball
Joint
Lights
Depth Sensor
Camera



List of required equipment

- Flanges x2
- Onshape CAD software x1
- Wires
- Ball valves x2
- Funnel for abrasive x1
- Fluid cup for paint x1
- Needle nozzles x3
- Circle nozzles x3
- Splitters https://www.aliexpress.com/item/1005003152356678.html x2
- Servos x2
- Compressed CO2 Canisters x1
- Plastic tubes for air delivery
- Metal pipes for sand blaster and paint sprayer
- Breadboard x1
- Batteries x4
- LEDs x6
- Camera x1
- Plastic for Camera end effector housing

- Arduino x1
- Depth sensor x1

Project risks and contingency plans

Table 1: Risks and Plans

Risks	Contingency plan
Exceed given budget	Come up with an analysis on why we require more money and present it to the PM
Valve is not optimal	Research other valves
Motor cannot turn valves	Research other valve control systems
Code run time is too slow	Optimize code

Prototyping test plan outline

Protype 1:

Objective: Test how many lights are required for optimal illumination levels for the camera

Test: Luminosity and light radius

Prototype 2:

Objective: Test the most efficient Inverse kinematics code

Test: run both codes and see which one the arm can run fastest

Prototype 3:

Objective: Test if the servos can turn the valves remotely

Test: Torque output of servos

Prototype 4:

Objective: testing optimal pressure for sandblasting and painting

Test: Change pressure and observe effects

Wrike link:
https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=SFGqfGVF7YSVs0OuSv8w2qdIgOojMyId%7CIE2DSNZVHA2DELSTGIYA