

2019 SMDC Challenge- IU Team Proposal

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For the solution to the problem of a rainfall of petals on stage the IU team proposes the use of an archimedes screw built into a five gallon bucket.

Our understanding of the challenge parameters is as follows:

- The effect takes place center stage and must fall on an area 3' in diameter.
- The device may have power or hosing running to it on an 1½" SCH 40 batten.
- The device can not take up more than a 20" x 20" footprint on the same batten.
- The device should be operable by a crew person 25' offstage and reloadable from 15' below without flying anything in.
- The device needs to be relatively silent during operation, but the reloading process does not need to be silent.
- The device should be reusable for other drop effects such as snow, confetti, or ping pong balls.

Our machine will drop petals by drawing them up to holes cut into the sides of a five gallon bucket near the top. This is achieved by using a double helix archimedes screw made up of a PVC shaft and blades cut from plastic sheets. The screw is turned by a small electric motor secured to the top of the bucket's lid.

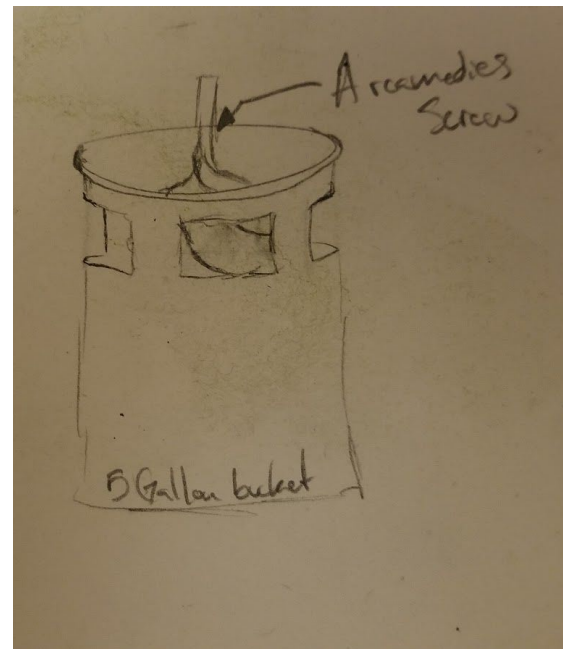
For the reloading of the device, our plan is to run vacuum hose offstage along the batten which then drops down to a shop vac modified to blow its contents up the tube into the central PVC shaft, which has holes cut into the bottom to allow the petals to spill back into the bucket.

Materials and Items

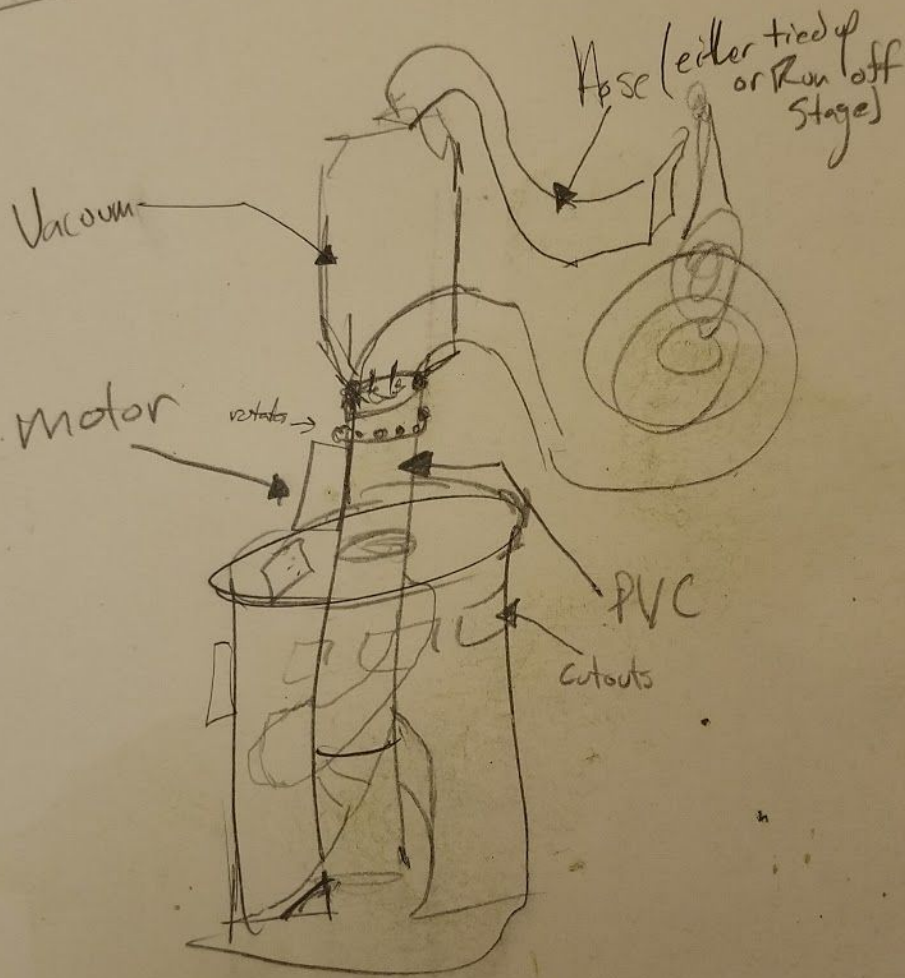
- 5 gallon bucket\$3.25
- 4-5" Diameter PVC pipe\$7.92
- 1/8th" or 1/4" Plastic Sheets (Potentially UHMW).....\$13.56
- 2" chip brush/ bristles for clearing static from Petals.....\$10.00
- 1" box steel bracket with a C-clamp connected to it (used to connect to Batten).....\$27.99
- Small DC Motor with Bicycle Chain (to turn shaft)\$7.00(Chain)
- Motor Control 30-40' zip to on/off switch.....\$20.00
- Tie line\$11.23
- Small Shop Vac or Leaf Blower\$21.97
- 15-20' Vacuum Hose.....\$29.99
- Petals/ Ping Pong Balls\$13.19

Concept Drawings

Much of the reasoning behind what our team settled on was the idea that it could be repurposed for snow and ping pong balls. With the gallon bucket the idea is that the dropping of petals will be in a circular pattern. The motor is to keep the archimedes screw at a consistent speed. Then the Vacuum should be an easy method to get the petals back up into the air. We went back and forth about using air for a while but finally settled on the Vacuum idea after rethinking the archimedes screw. By adding the hollow PVC tube in the middle we are able to bring air into the system without blasting petals back out everywhere or hoping they don't fall back out our pre existing holes.



Petal Drop



Notes

* NTS

- Petals fed through vacuum into PVC
- Whole system hung to Batten

Manuels/Safety instructions

- Please keep the bicycle chain free and clear of all debris
- Please ensure that the wire leading to the motor control is tied up cleanly. TEST before securing the Petal Drop Machine to the Grid.
- Please ensure the vacuum hose is tied up cleanly. TEST vacuum reload on the ground before securing it to the Grid.