

Soil-o-moisturizer 9000

Automatic plant watering system

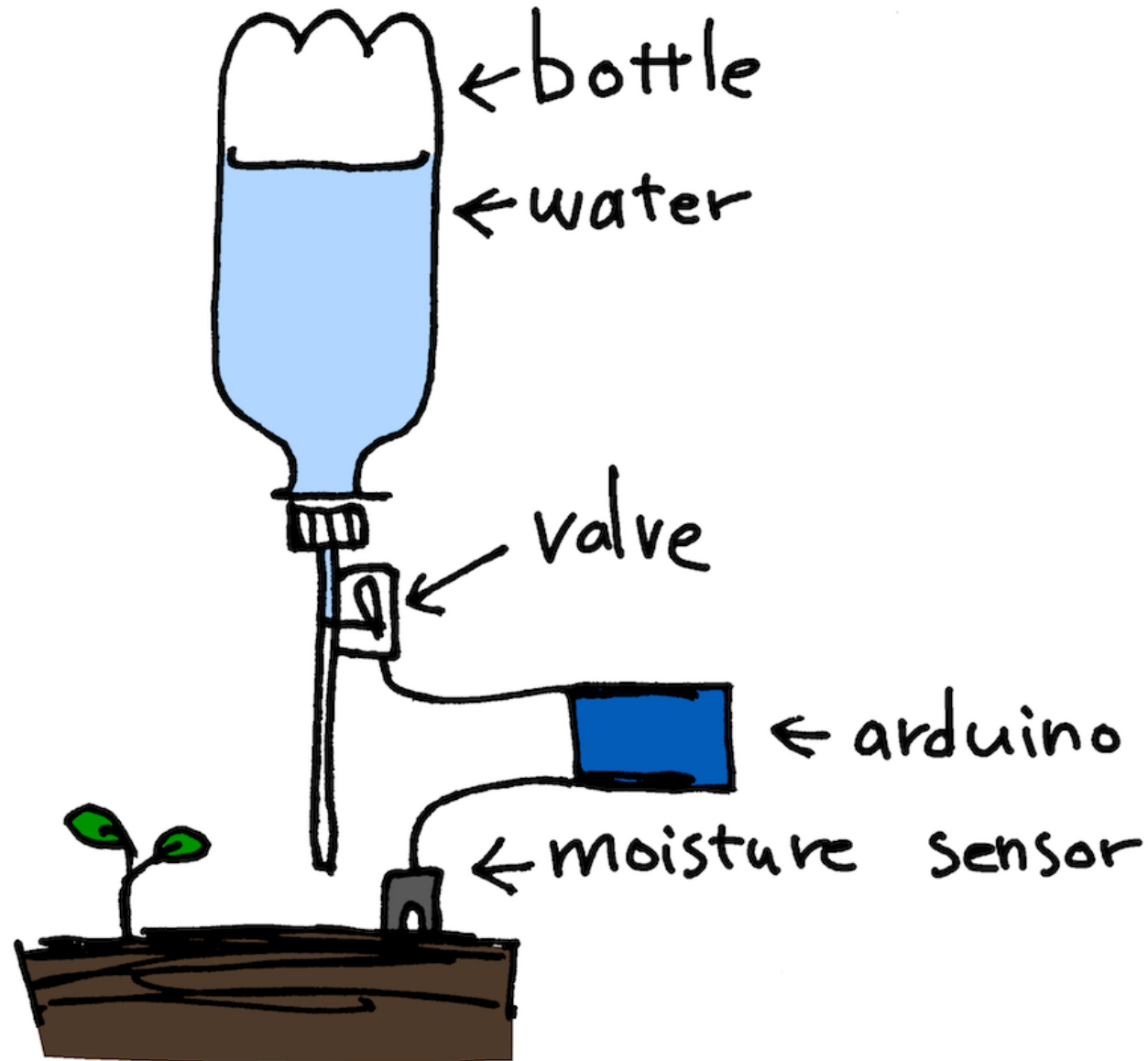
Other ideas

- Surveillance robot
- Persistence of vision toy
- MIDI electromechanical instrument or sound module
- Camera dolly
- Aperture motor for manual lens apodization effect
- Focusing motor for manual lens
- Sun tracker for solar panels
- Metronome
- ...
- Automatic watering system idea chosen for its relative simplicity and usefulness

Possible watering mechanisms

- Gravity driven design
 - Water reservoir is above soil
 - No pump needed, only a servo for opening and closing the valve. Water drips to the soil on its own.
- Water pump
 - Water reservoir placement not critical
 - Risk of damage to motor if water runs out
- Air pressure
 - Air is pumped into a sealed water reservoir, pushes out water

Chosen mechanism



Moisture sensor

- Soil dampness is measured from electrical resistance
- Two nails in the soil connected by wires to the arduino
- One nail connected to digital output pin
- Other nail connected to analog input pin

Watering pattern

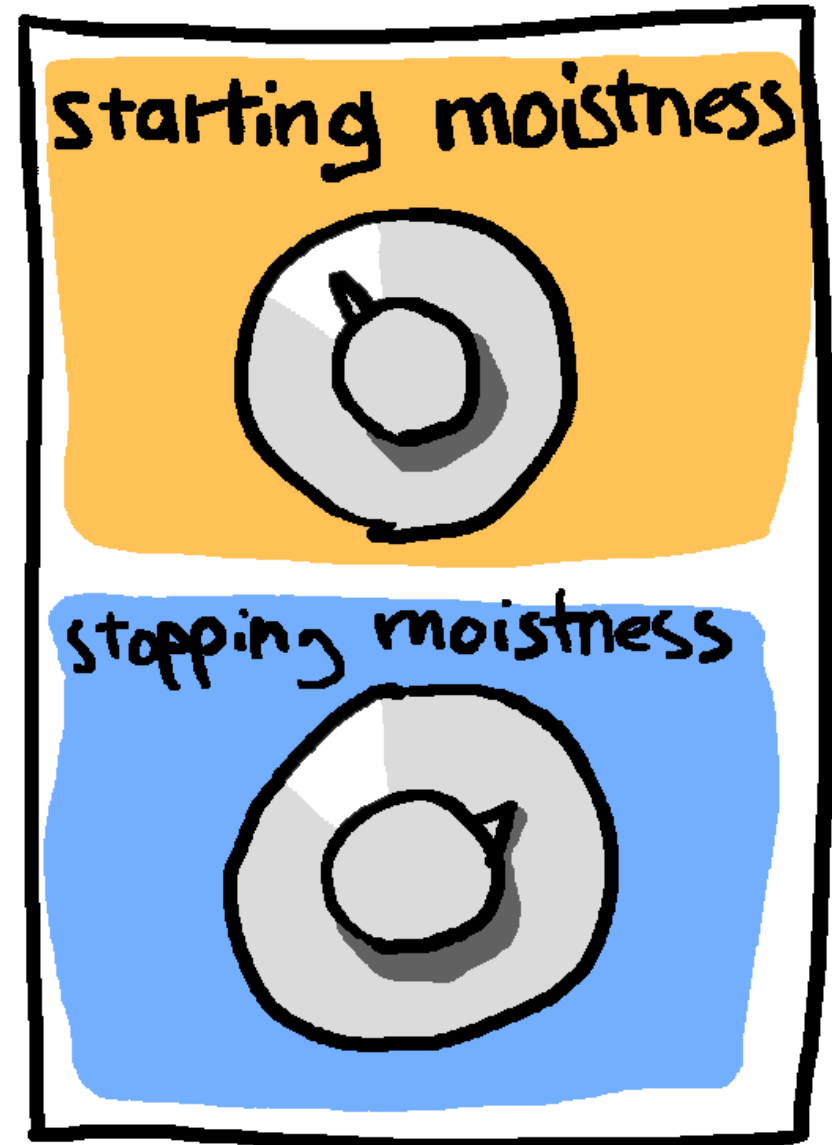
- Constant moisture
 - Keeps the soil consistently moist
 - Simple since only one state needs to be considered
 - Not good for cacti
- Wet-dry cycle
 - Good for cacti
 - More complicated

User interface ideas

- No user interface
 - Hard code operation of the device
 - Might not work on all kinds of soils, can't change watering pattern without reprogramming

User interface ideas

- Dry-wet cycle interface
 - Two potentiometers for selecting when to stop and when to start watering
 - Might take a long time to get the settings right since it takes minutes for water to diffuse into the soil and days for the soil to dry



Chosen UI design

- Compromise between the two watering patterns
- Water dose size is selectable
 - Upper button cycles, LED indicates chosen dose
- Set dry point-button
 - Button sets the point at which the device considers soil dry enough to water again. Sensor needs to be inside dry soil when calibrating.
- Small dose gives consistent moisture
- Large dose will give large variation of moisture

