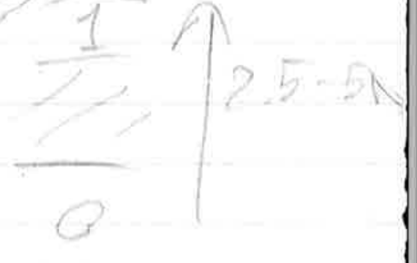
V_{GS} controls Resistance between drain an source

V_{GS} ? V_{DS}

3.3V raspberry pi

No relation between V_{GS} and V_{DS}

We are free to choose U_{DS} and
V_{GS} controlled by this



V_{DS} 4,5-12V

Power source : Specification:
power ? current ?
power supply provides current at 6V
up to maximum current

V_{GS} is for controlling the power
V_{DS} is for power

5V from raspberry pi $V=IR$

12V ○

14Ω

$P = \frac{VR}{R^2}$

$P = VI$

$P = \frac{V^2}{R}$

$P = \frac{12^2}{14}$

10W

$P = V^2 \cdot I$

1.5W ×10

R

$P = \frac{V^2}{R}$

Requirement for the power source ?

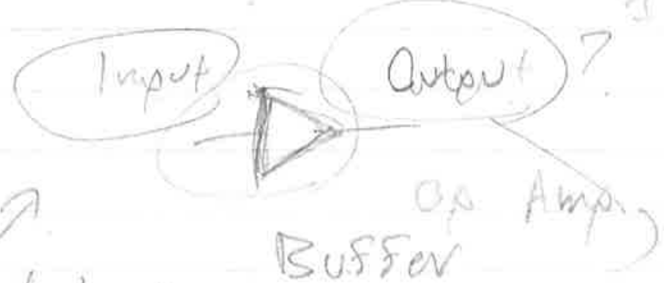
Digital Logic

2.5-5V

DC Voltage

Motor 4.5-12V

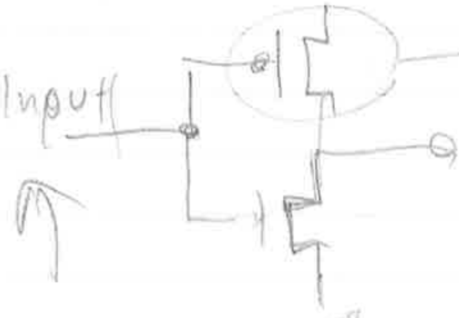
?


Input
Output
?
Op Amp
Buffer

Digital Logic

Motor connection

Buffer a switch ? No



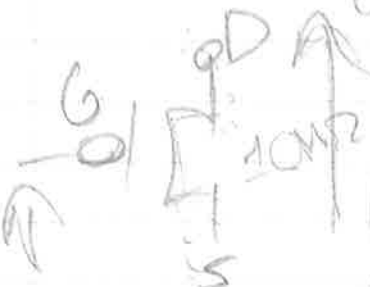
MOSFET

Controlled by voltage

2.5-5V = 1 ON

0 OFF

V=0



Input Mosfet

0 $\infty\ \Omega$

1 $0\ \Omega$

?

1

1

V↑

$V = IR$

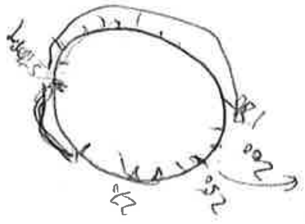
0

1

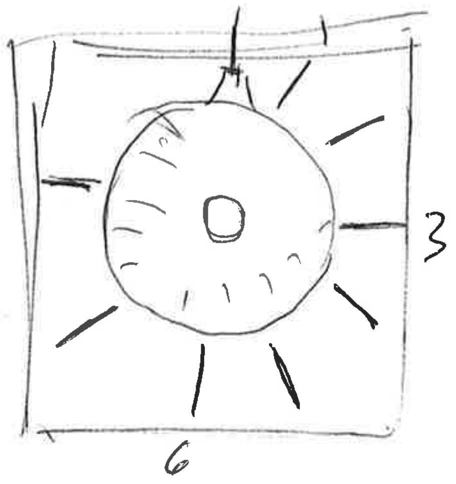
$I \propto V$

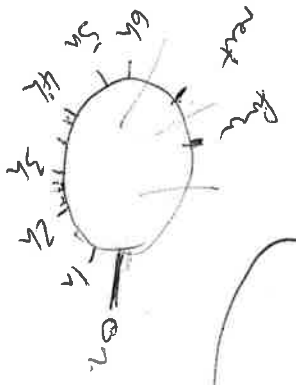
always the same

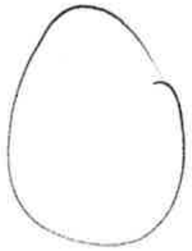
$I = \frac{V}{R}$

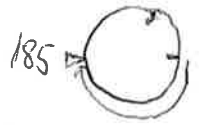


sig alarm

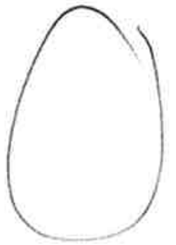




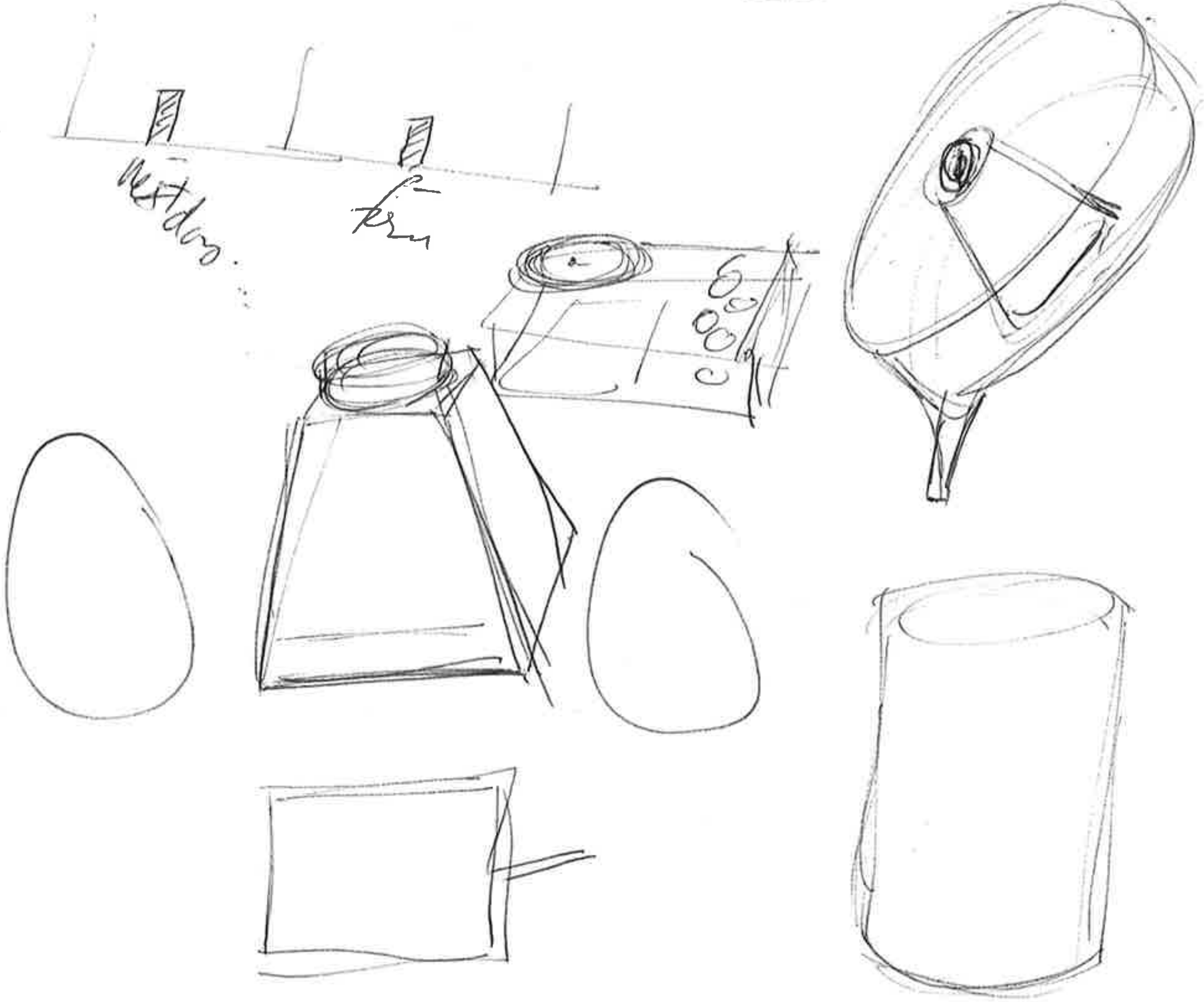


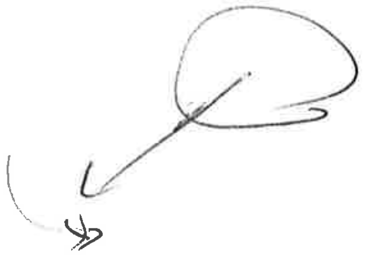


18 hrs passing



10.70.55.131





tick_motor → new angle

10 - oclock

new_angle ~~10.01 hours~~

adc_value = 23000

current_angle_required = 22500 ← new time reading

+200

22700

+200

22900

+200

-23100

if (
current_angle > adc_value
tick ()
~~ne~~ new-adc-value
adc_value = new_adc_value

while true

@ -25000

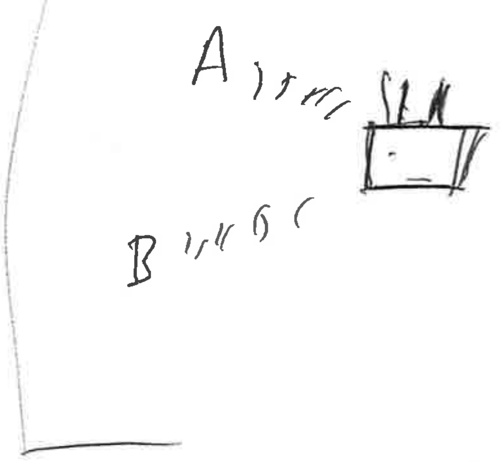
current_required_angle

if ~~time~~ > new_angle
→ tick_motor
new_angle =>

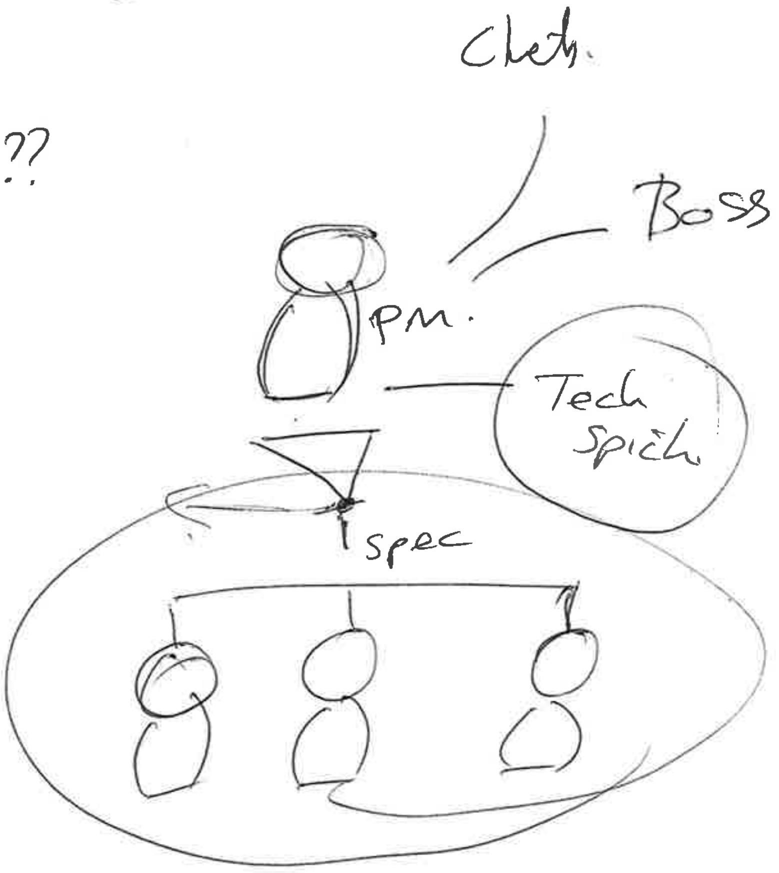
0.2° - 0.3°

2° per rotation

Specification Board.



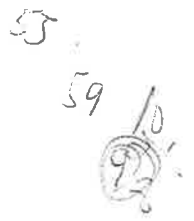
- Overall aim
  - build a tangible Genie.
  - more than one in home (same ~~con~~ selects). mirroring
  - Pase sphere system. data collection
  - delete data from sphere data collector.
  - talk to sphere hardware.

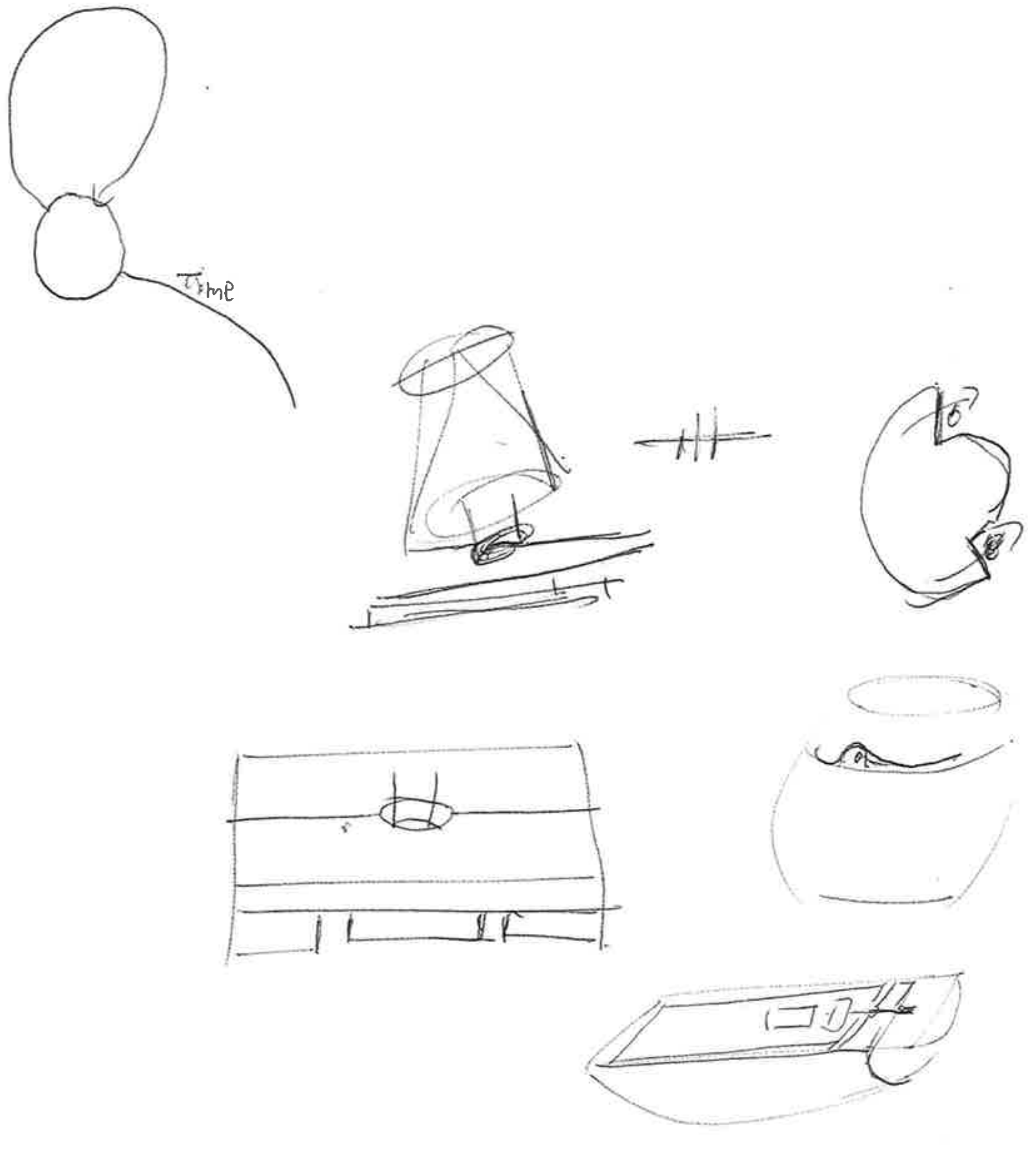


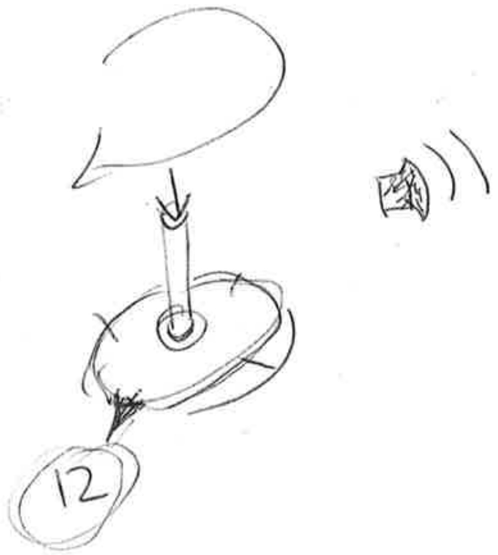
- System Design
  - rotate controller to select pane.
  - press button to delete
  - know time → Digital RTC. → rasby pi??
  - Battery power / power socket.
  - rasby pi Zero
  - ADC. • MOTOR CONTROLLER
- rotate controller to select pan
  - motor : Gear to turn.
  - POT :
  - Functionality & minutes.

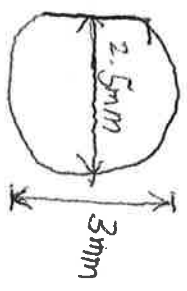
time interval ✓

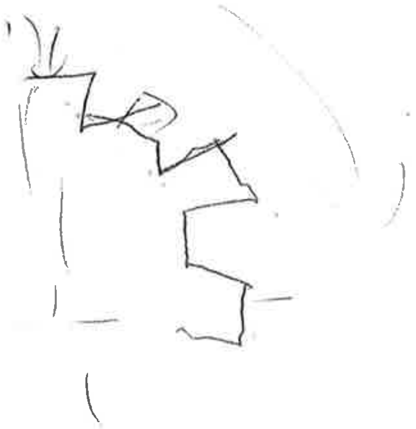
motor speed. ✓

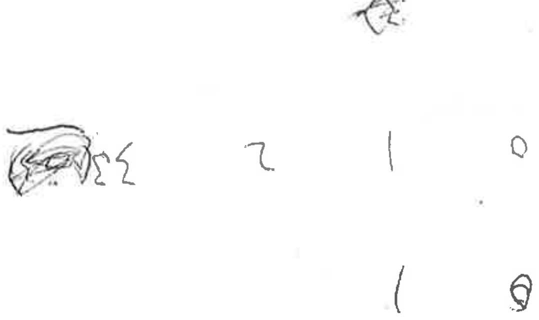


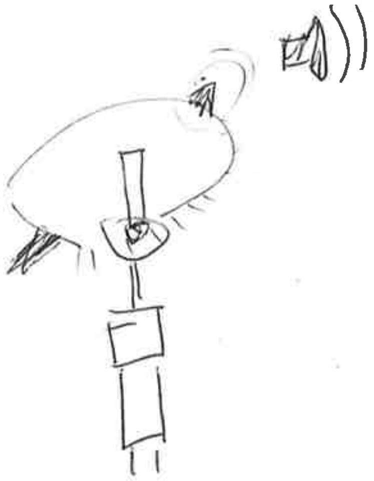


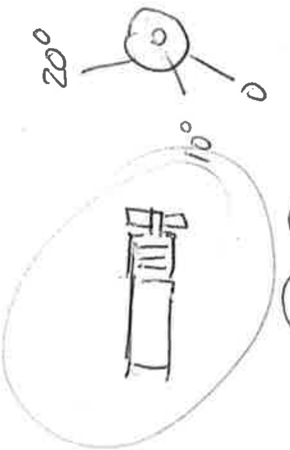




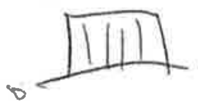


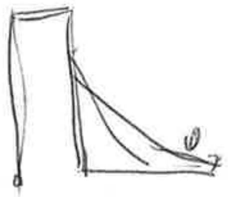


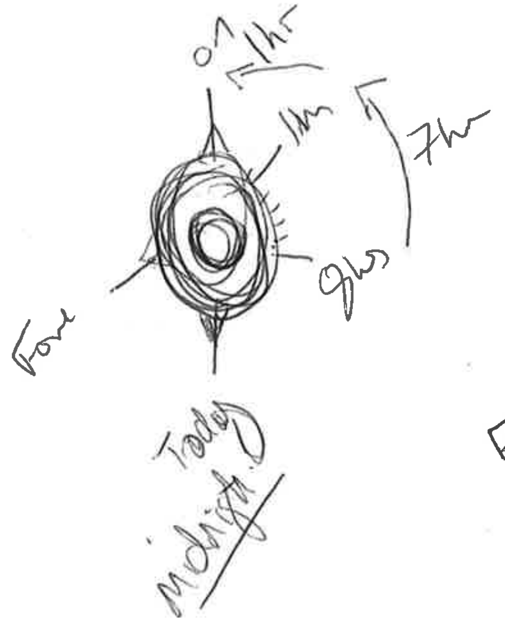


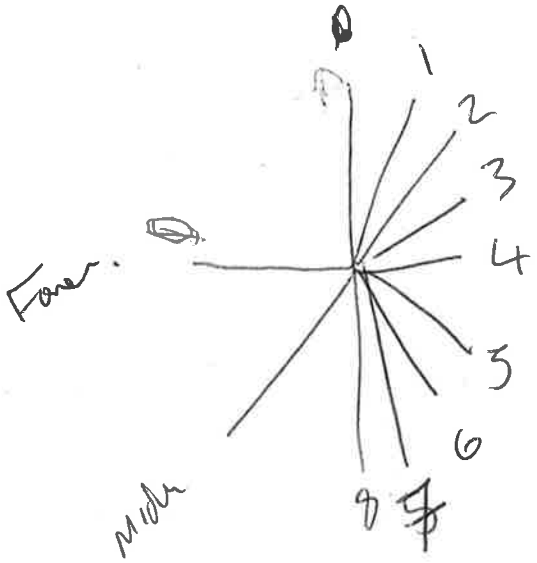


① know angle
② contl motor

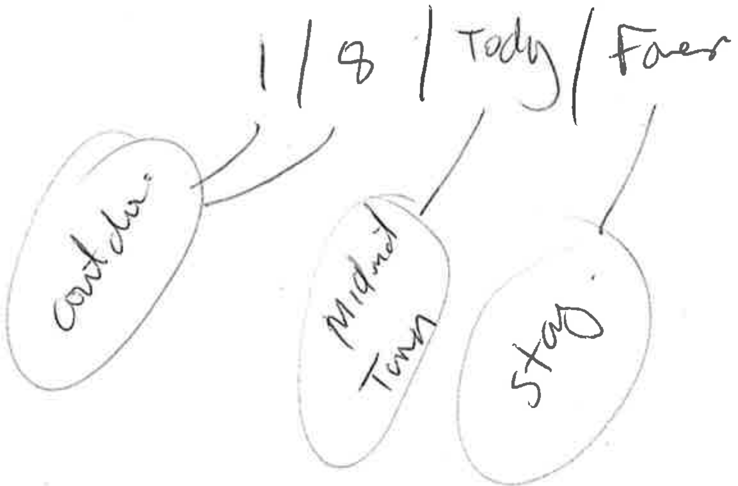




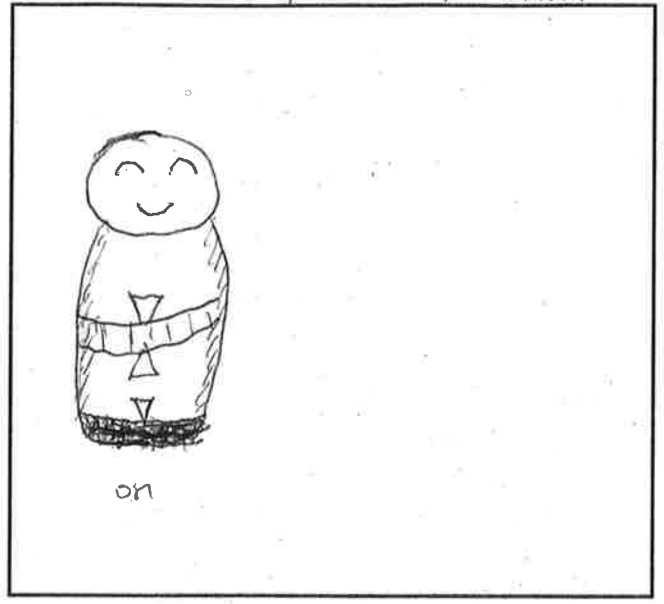

0h
1hr
1hr
7hr
9hr
Forv
Today
midnight


0
1
2
3
4
5
6
7
8
Forev.
Midn

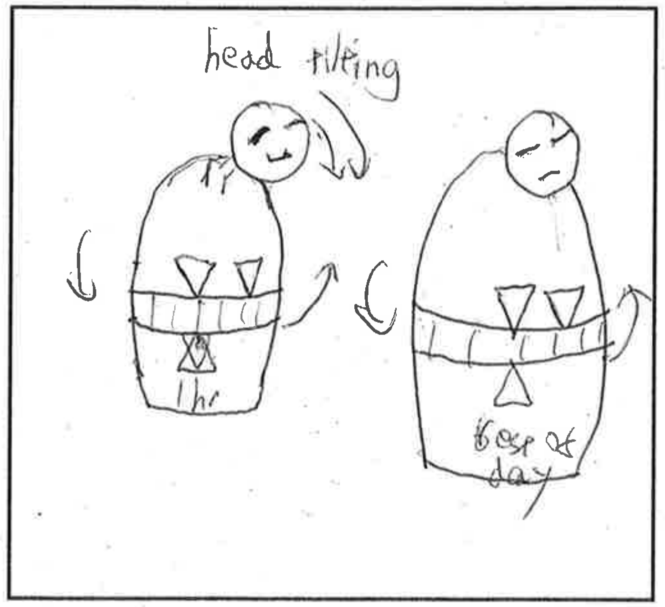
Forever
0hr
8hr


1/8 | Tody / Forev
cont dur
Midnit Turn
stay

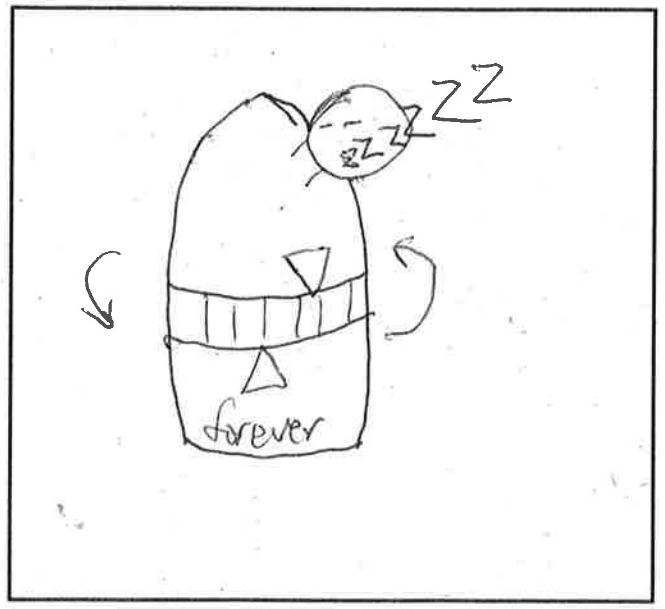
Doll. Pause function



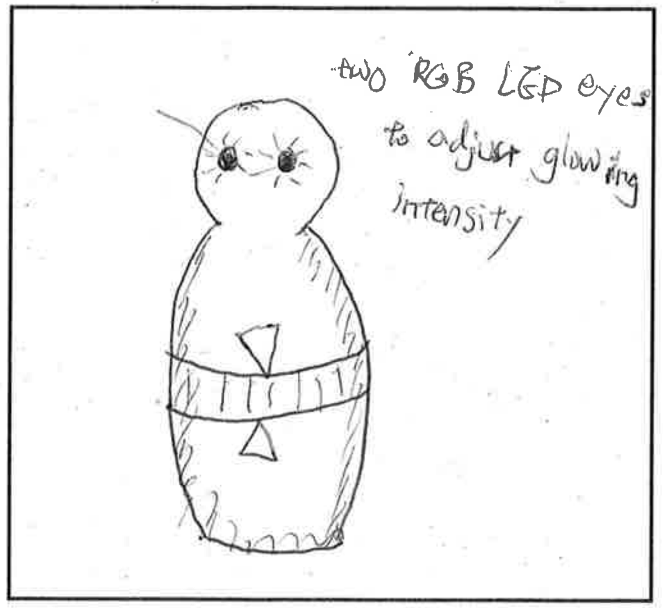
no interaction


head tilting
1 hr
rest of day

Pause for 1 hr
|
|rest of the day

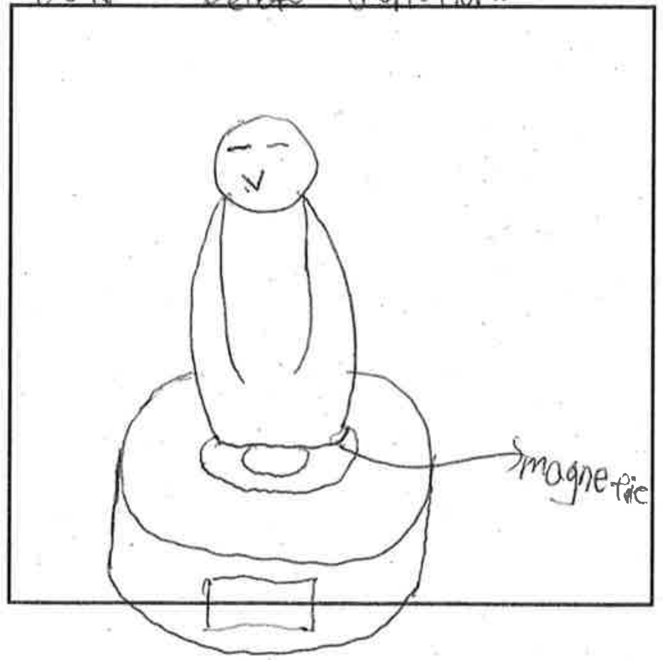

zzZZ
forever

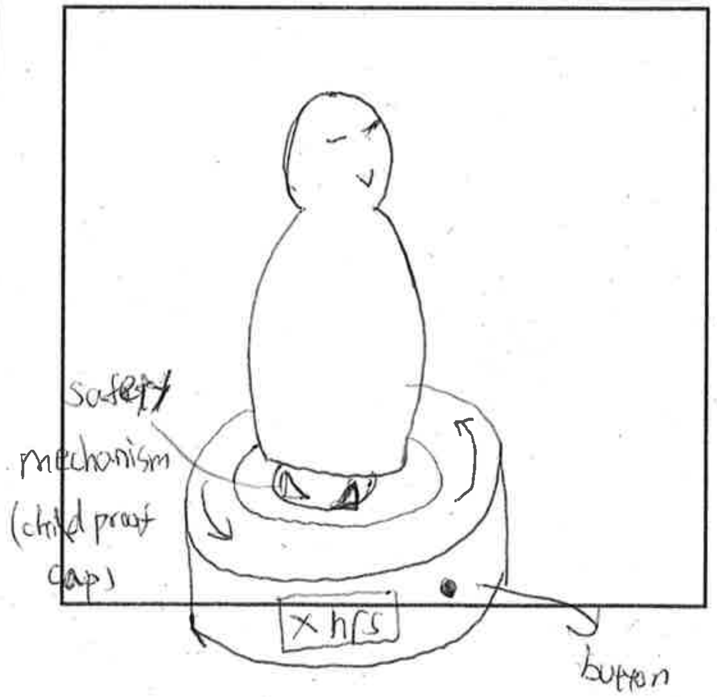
Pause forever

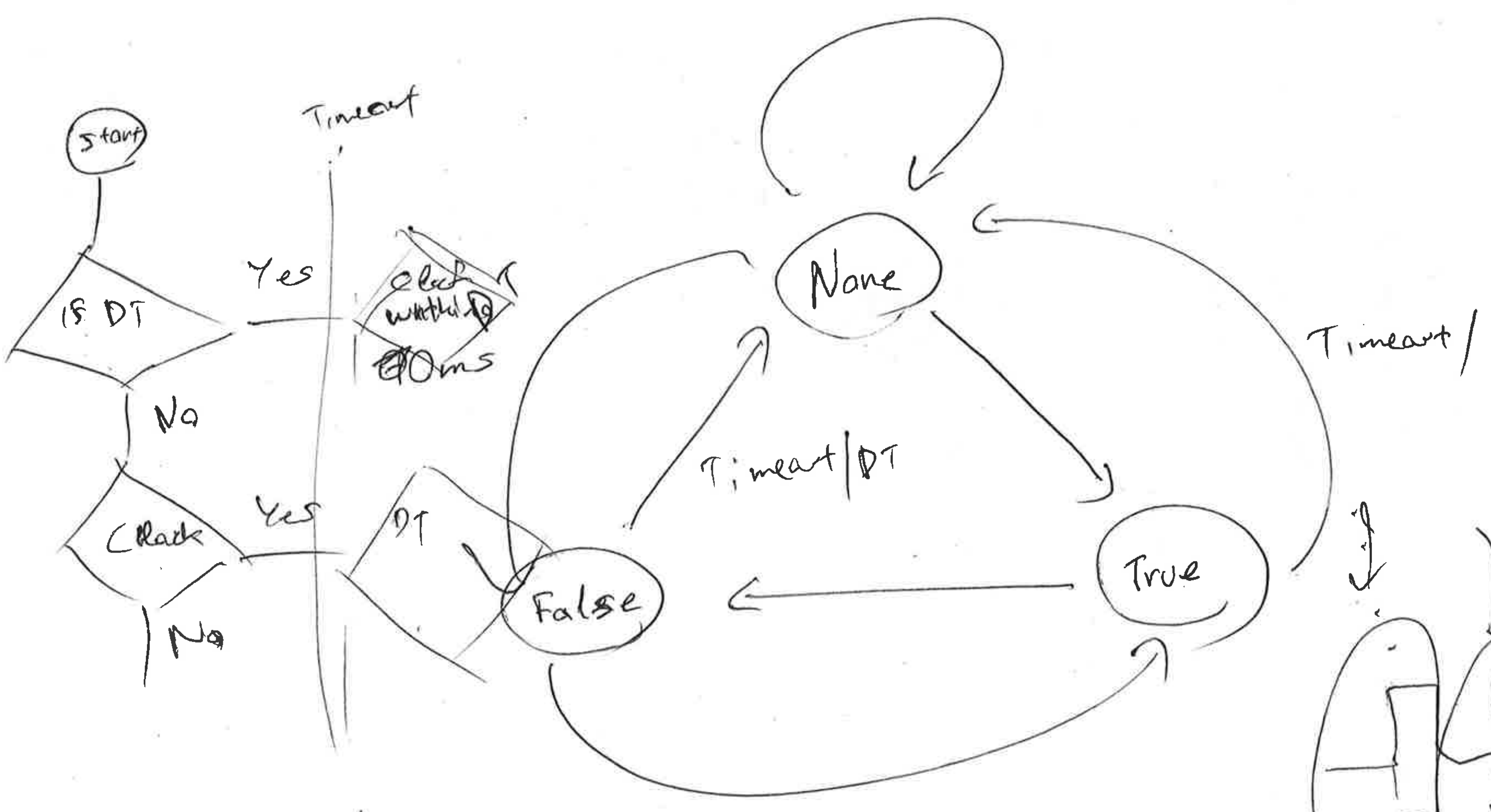

two RGB LED eyes to adjust glowing intensity

On/off
LEDS notification..

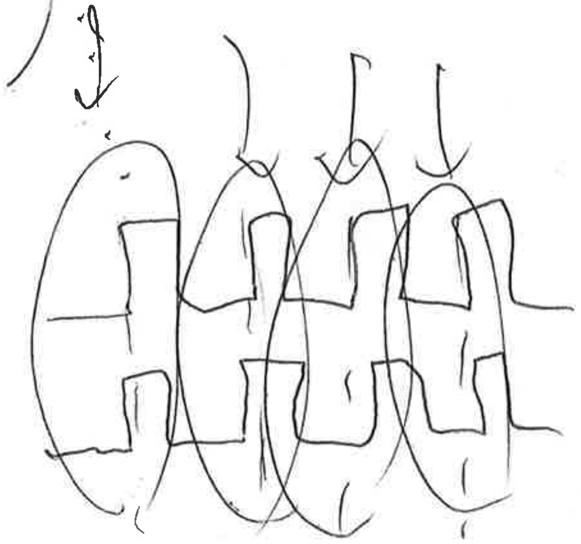
Doll Delete function.




safety mechanism (child proof cap)
x hrs
button


Start
IS DT
Yes
No
Clock
Yes
No
Timeout
~~Clock within 70ms~~ T
DT
None
True
False
Timeout|DT
Timeout/

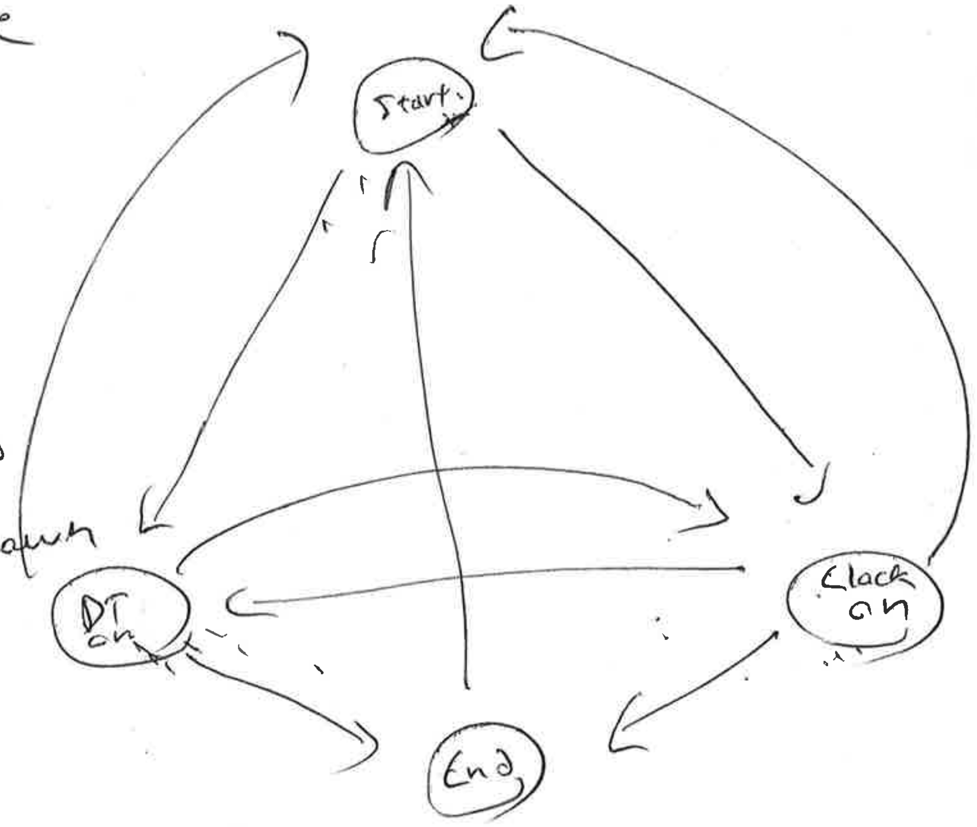
State	DT	CLOCK	TIMEOUT	
~~State~~	0			
NONE	0	0	0	N
	0	0	1	N
	0	1	0	T
	0	1	1	
	1	0	0	
	~~0~~	~~0~~	~~1~~	
	~~0~~	~~1~~	~~0~~	
	~~1~~	0		
	1	0	1	
	1	~~1~~	0	
	1	1	1	



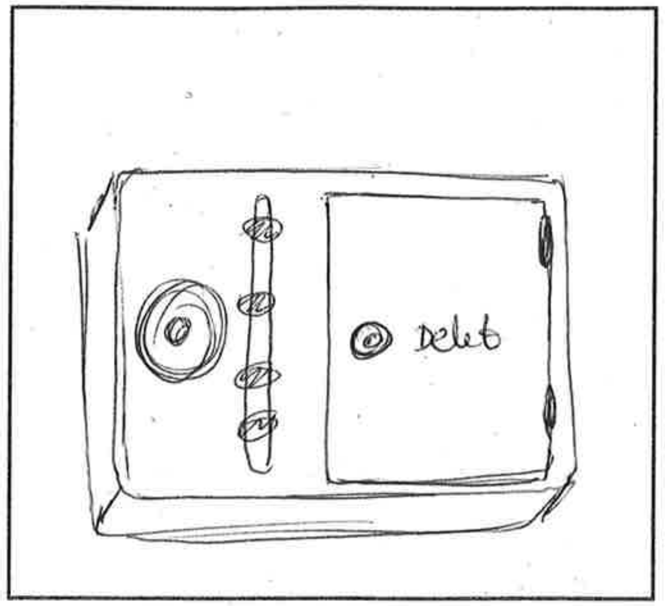
State	DT	CLOCK	TIMEOUT	Next State
~~State~~ None	0	0	0	None
	1	x	x	False
	x	1	x	True
				None
x	x	x	1	
False	1	x	x	None

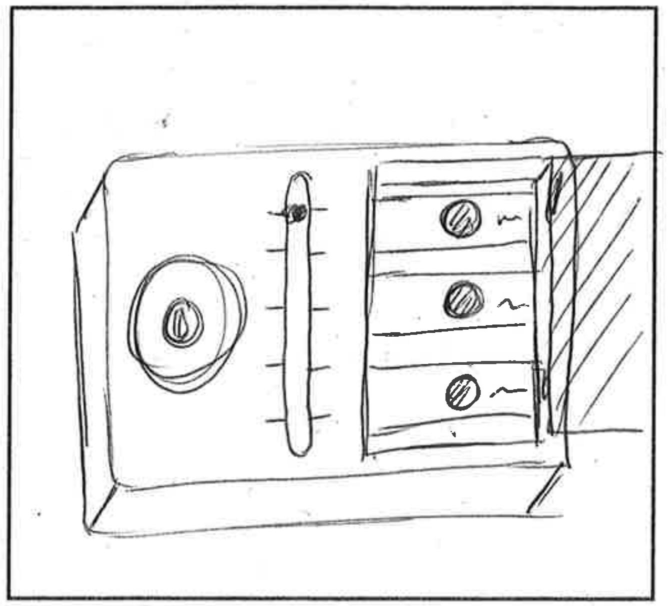
DT $\xrightarrow{\text{then}}$ Clock within 70ms → count up

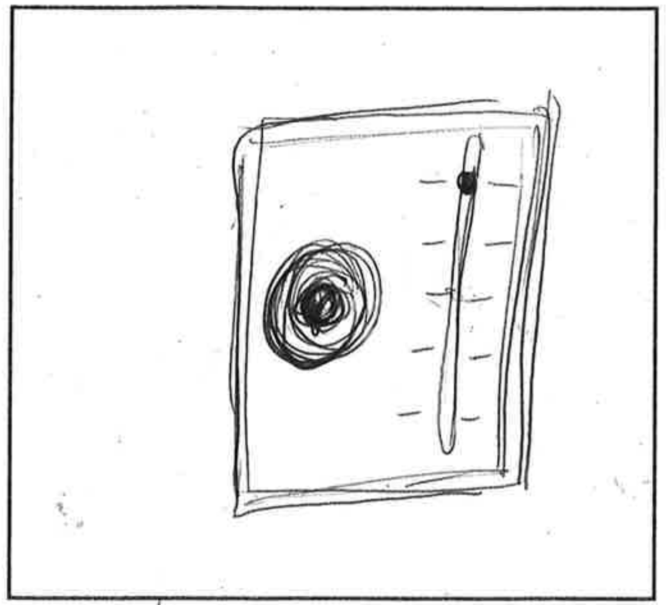
CLK $\xrightarrow{\text{then}}$ DT ?? → count down


Start
DT on
Clock on
End

radio with delete

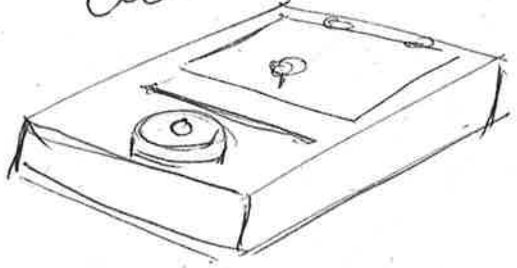


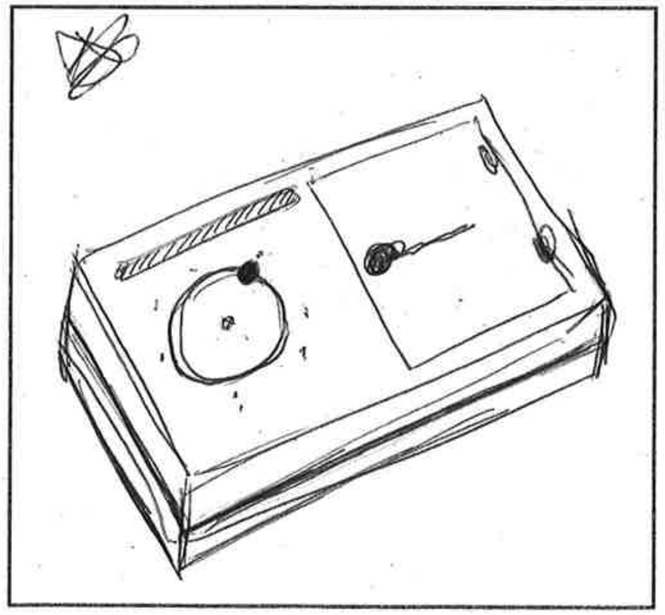




downstairs version.

upstairs version.

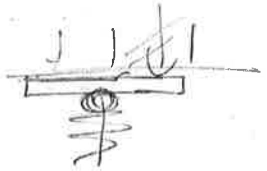




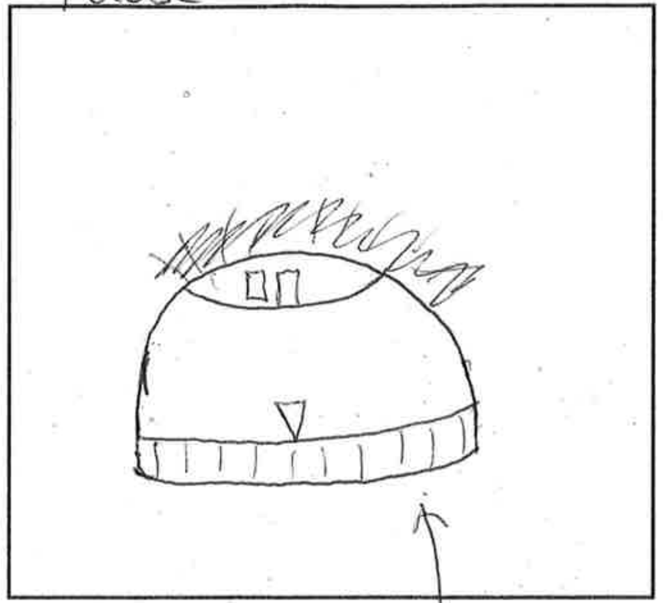
Adeeo – speaker/vibrator

-seperat audio for each button..

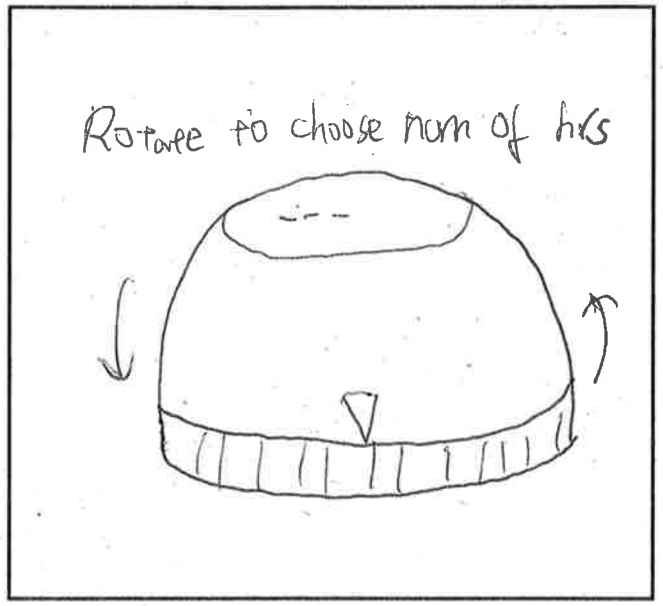
▨ agt.
☐ not
> texture



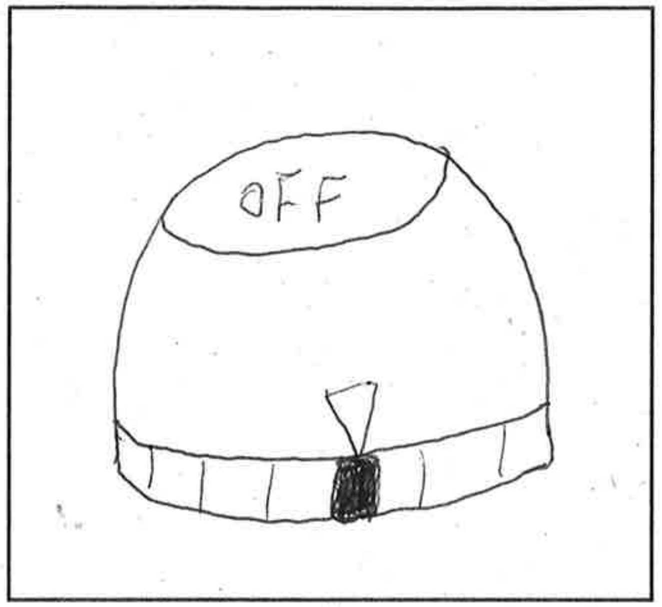
Pause



~~A~~ Active

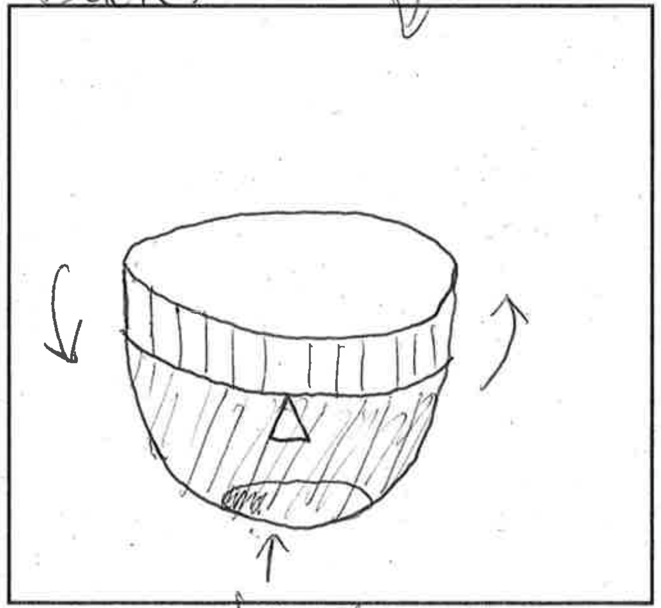

Rotate to choose num of hrs

Pause X hrs.

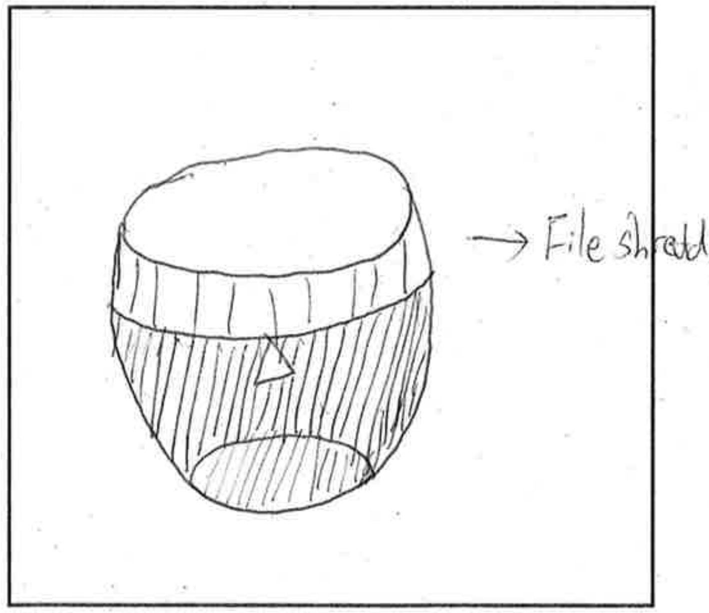


Pause forever.

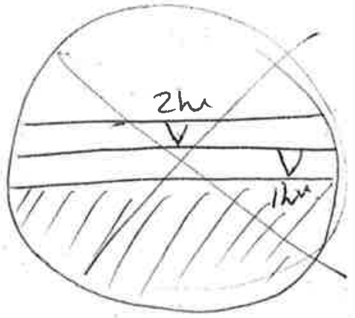
Delete.

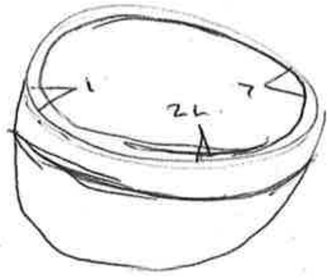


button (press to delete)



→ File shredding notification & haptic feedback.





1V EMF ∝ RPM !
6V

RPM = 0 $V_{EMF} = 0$

switch off the motor

12V exceed power rating by 2 times

6V 3 times the rating

1.5W

4.5V
3V

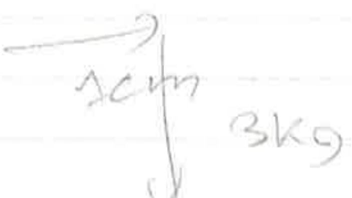
2 times the rating

it can last ~ 5 seconds (maybe 3s

5W

motor turns off

```
while (ADC value > 100)
    if ADC
    turn on(motor)
turn off motor()
```



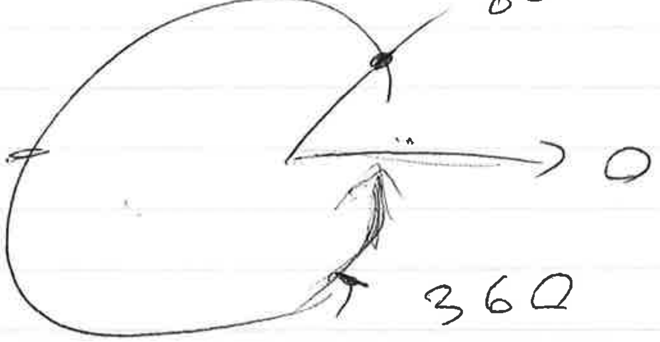
ratio $\boxed{\frac{\text{maximum} - \text{min} \; \cancel{2477}}{360}}$

$1° : 31 + 68.74$

angle_degrees = minimum + ~~requ~~ angle ×

$$\frac{24779 - 31}{360}$$

68.74 per °



value

0 - 360

31 24779

1°

3.3

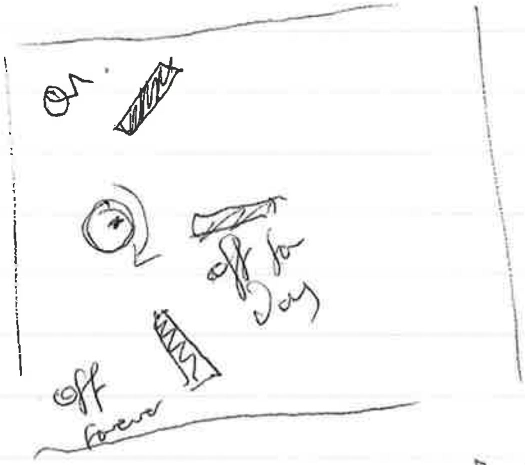
$5x = 0.5$

$x = 0.1$

$$\frac{10k}{10k + 90k}$$

Startup power ← balance the friction

$$\frac{1119 - 1192/100}{75} =$$



100° → 75 ticks

200° → 150

150° → 112±1

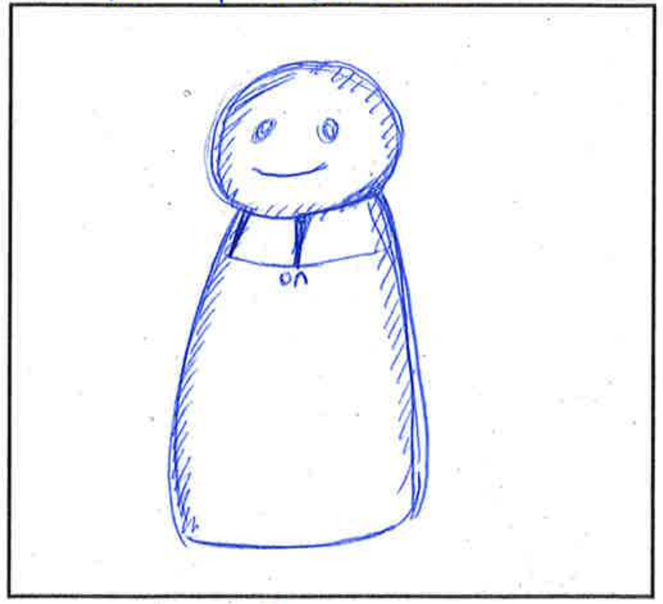
$$\frac{\cancel{150}^{3} \cdot 75}{\cancel{100}_{2}} = 112 \pm 1$$

−6 25 320

~ 0.5°

Doll with twisting head.

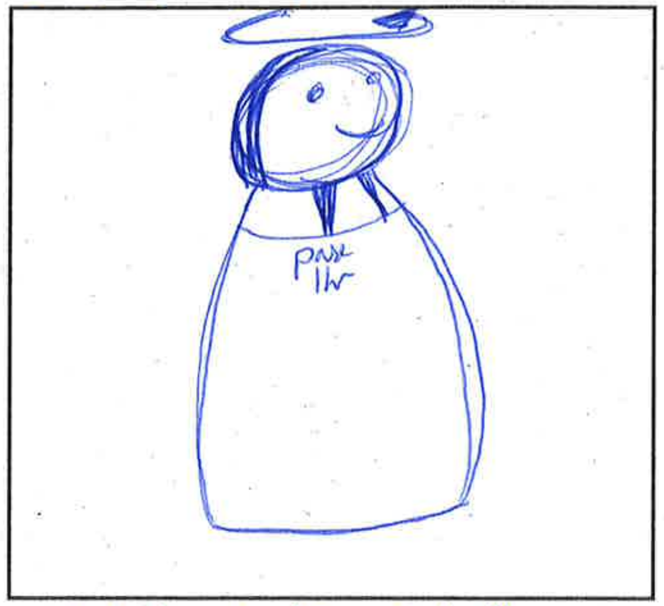
no interaction



~~No Intera~~

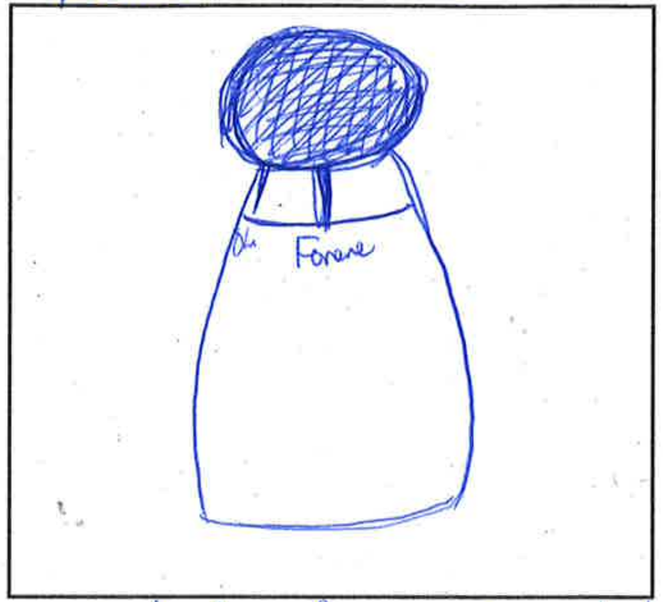
if all is working then the system sits at on, and that is it.

Pause for 1hr / rest of day.



ratat head to select the pause time. once it has reached that then the head slowly turns back to the on status. when done device vibrats.

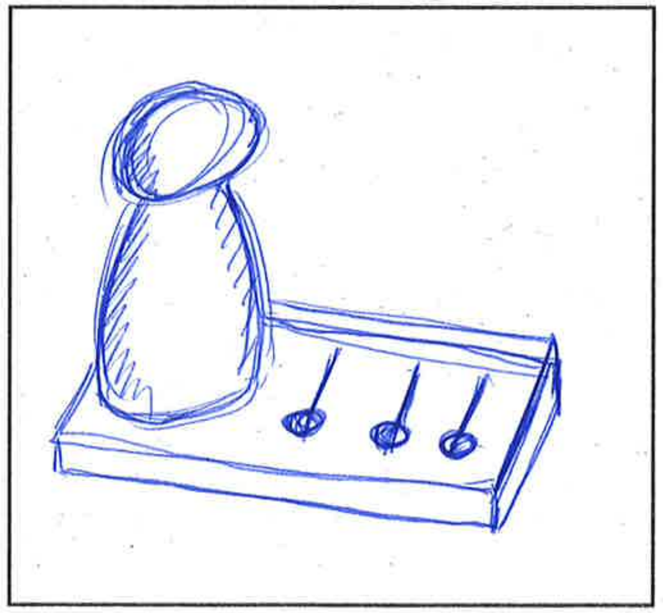
Pause Forever.



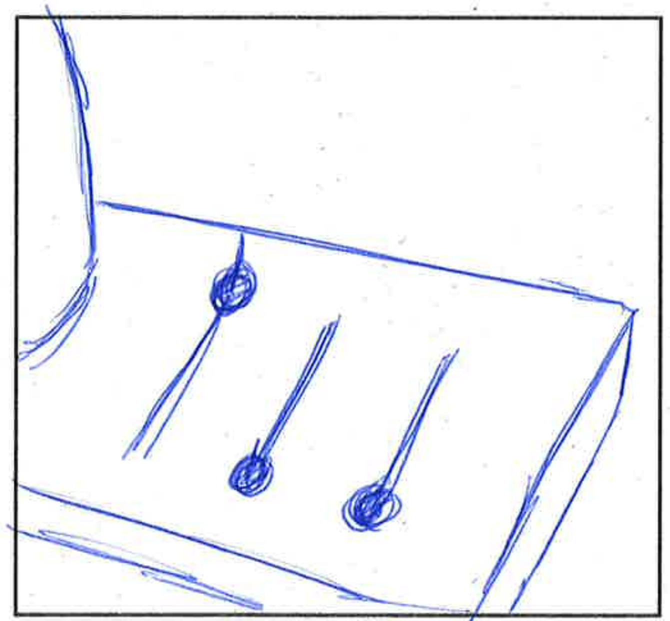
ratate head so face no longer lookin at you. device is now set to off an SPHG system is tuned off.

Just Pause.

Doll sits on box to includ delet.

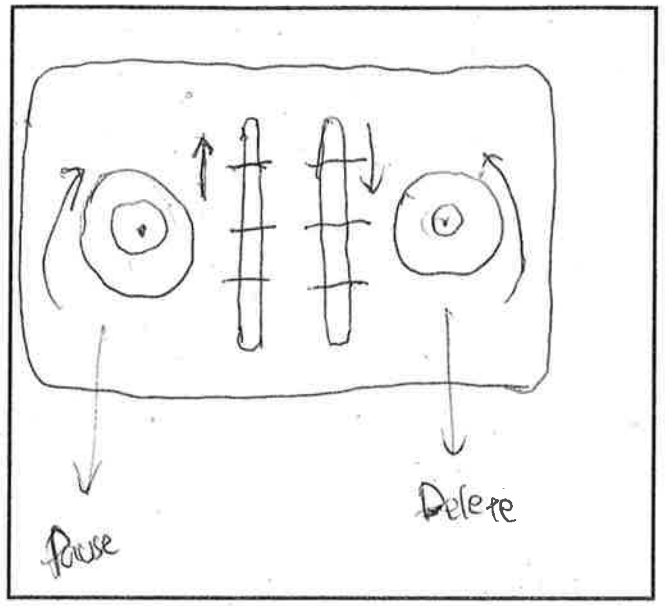


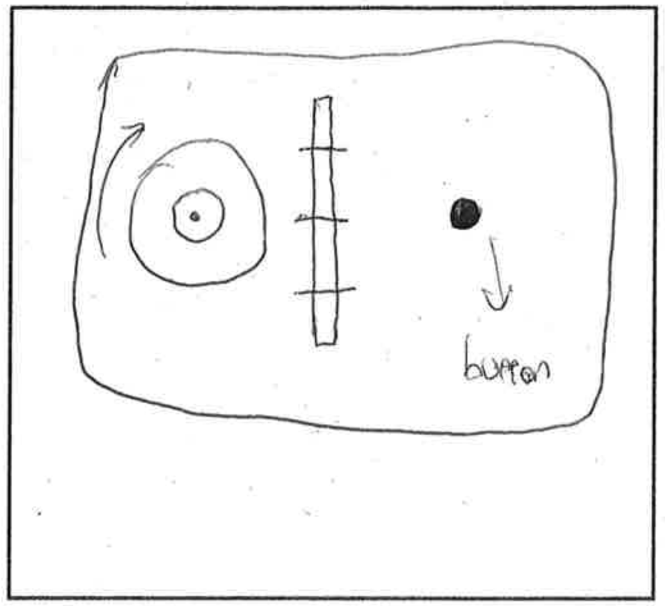
all is working and nothing is being deleted.



leaver move up to delet last 1hr, then automatically resets.. other lever can not be moved when one is active

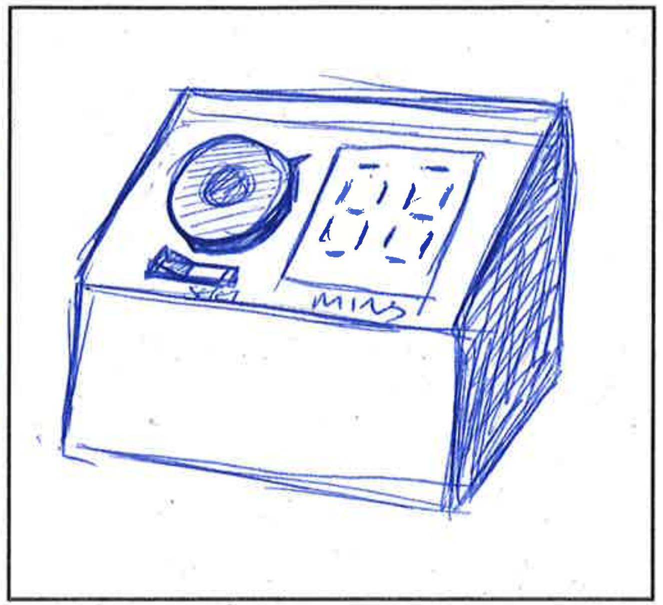
Detel.


Pause
Delete

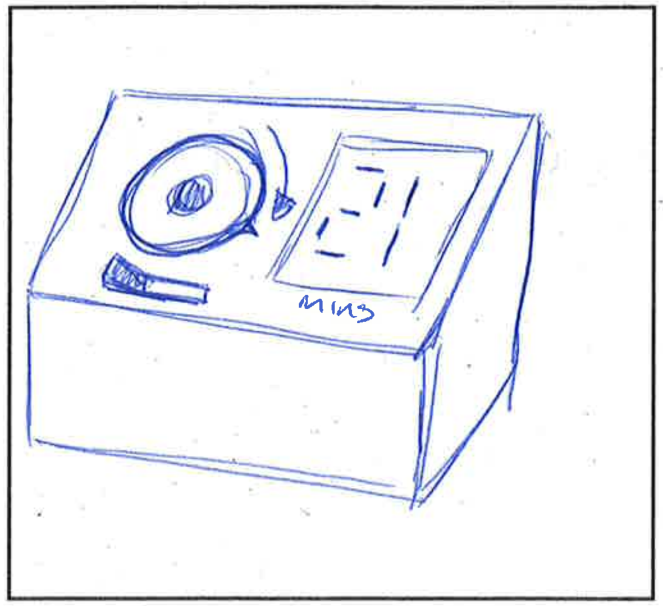

button

Just Pause.

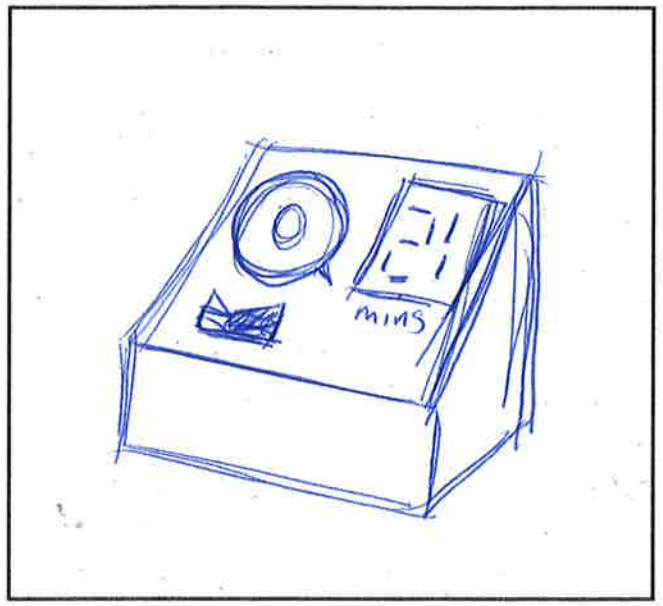
box with 2 screen + select button.



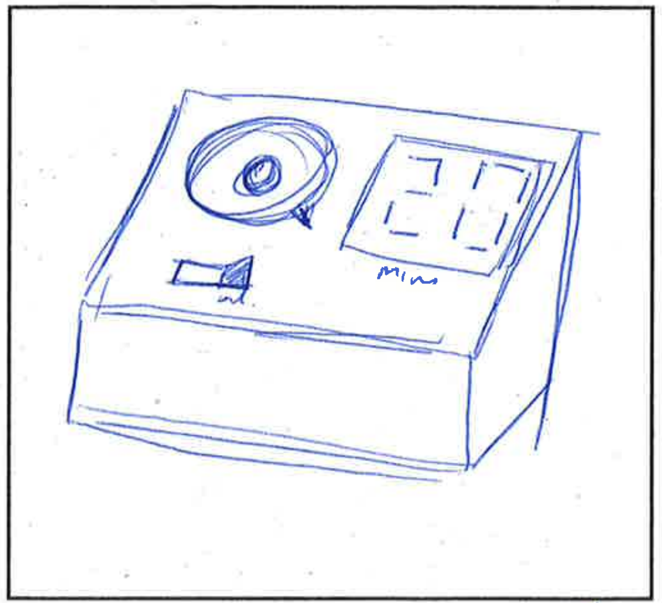
Nothing has been active and the display show no number.



Dial is rotated and the display shows number of mins ~~until the system is active again~~

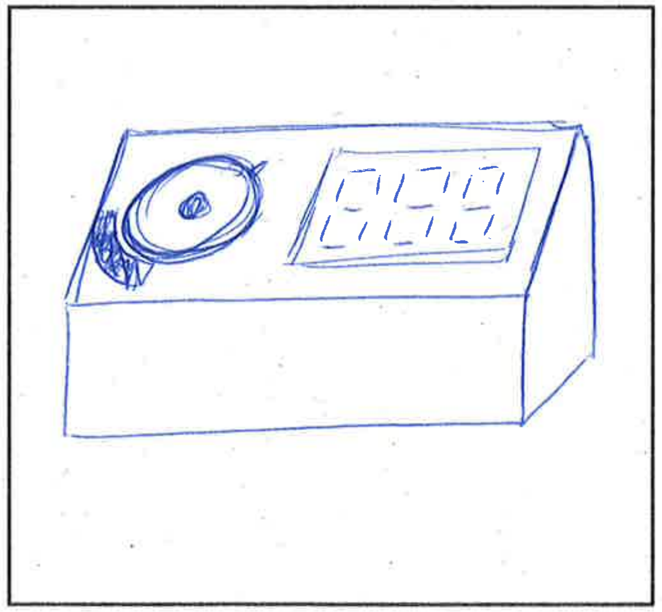


Clicking the button confirms the selection ~~and the switch goes back to~~

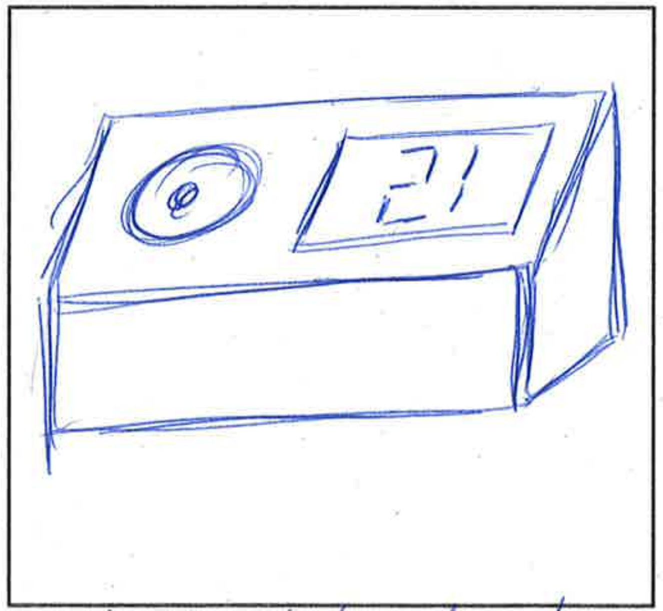


Number start to count down, Once completed the number is at 00 and the button is reset.

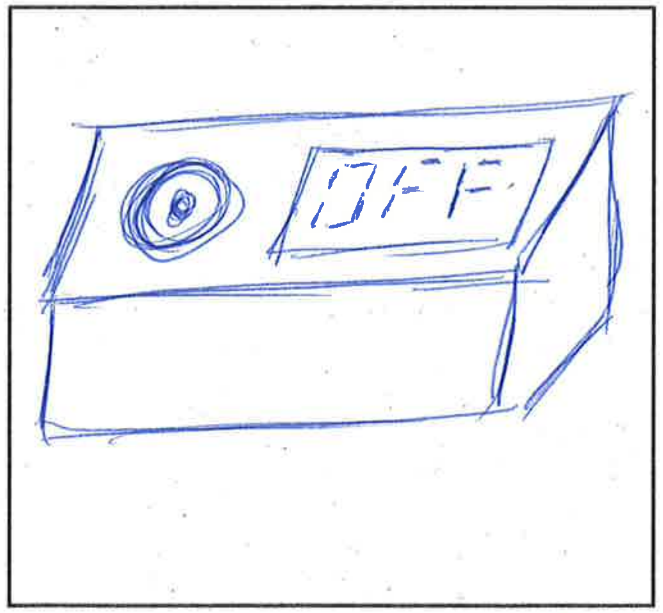
box with 3 screens



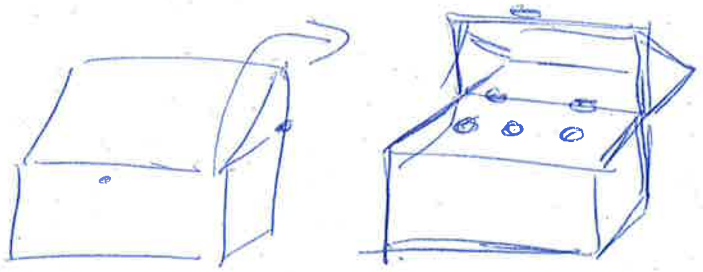
nothing selected so screen shows no. numbers



rotate to select number of Time, it then starts to count down..



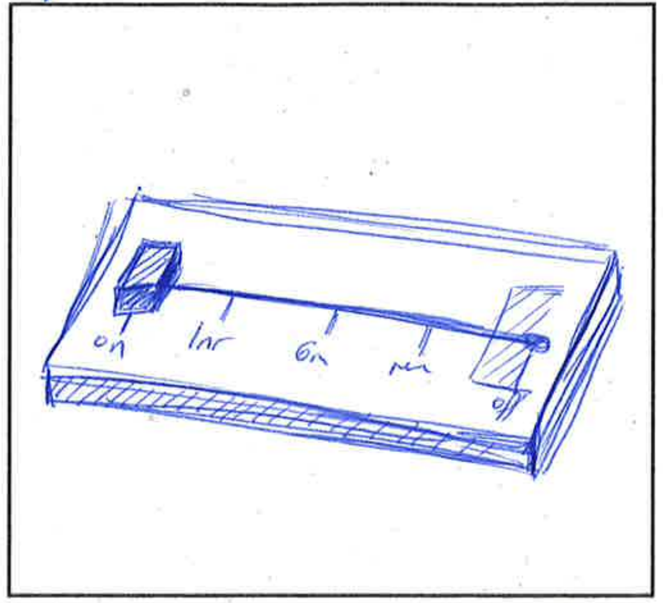
Turn all the way around on off is activated.



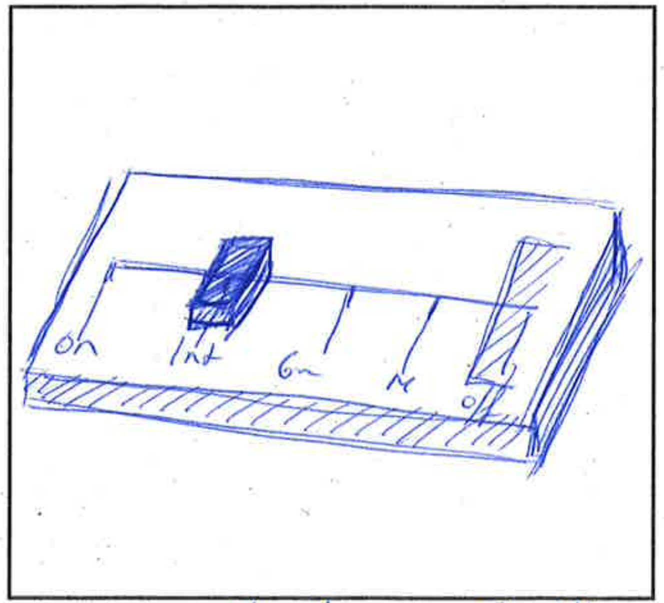
Pase only.

not actvaled.

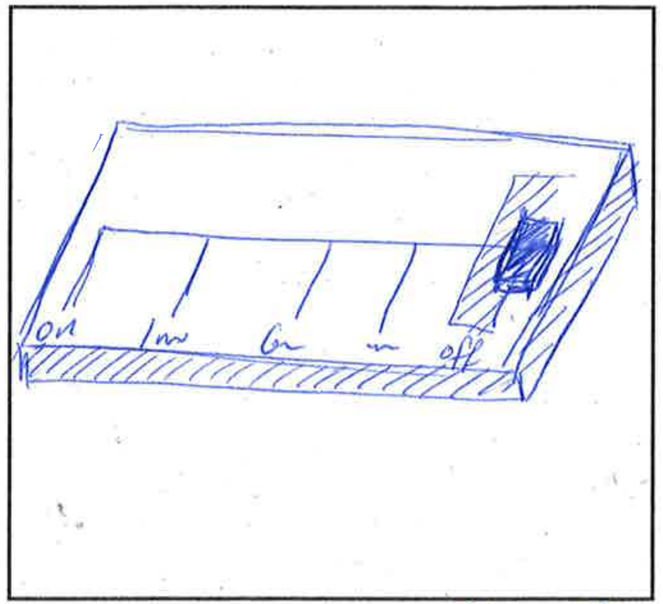
Slider


on
1hr
6hr
off

slider sits in on postion and dosenot move.

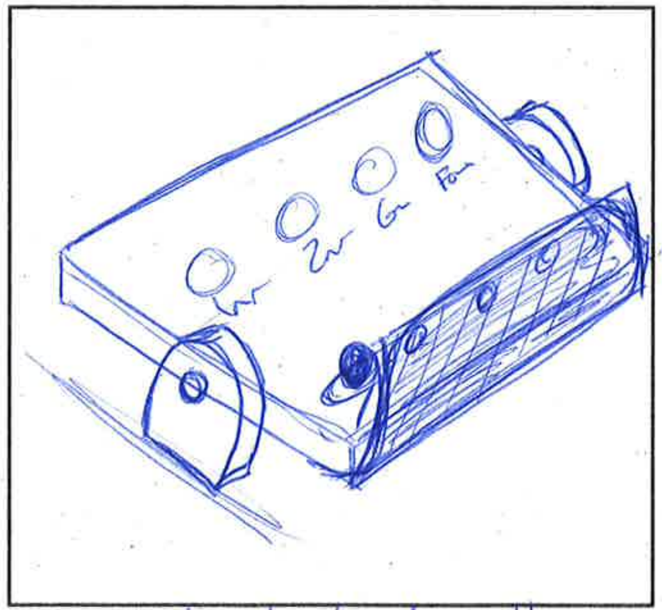


slide to 1hr to pause for 1hr and the slider slowly moves back to on position.


on
1hr
6hr
off

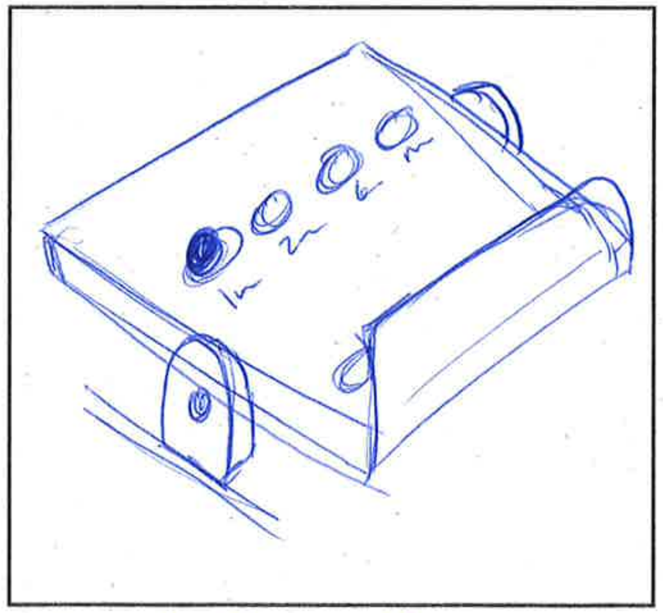
move slider to the off section on the system is off until the paticipant move it.

Tilt and ball

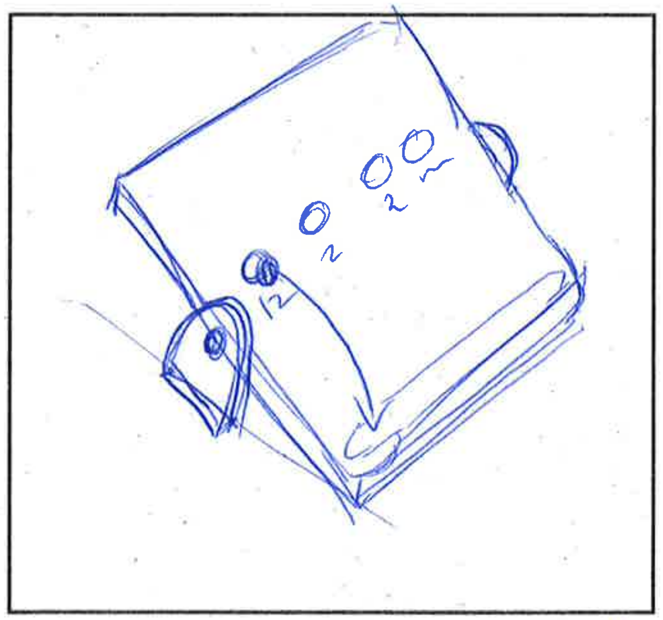

1hr
2hr
6hr
Four

have one

sets not interactived with you ball and can place it in a slot.

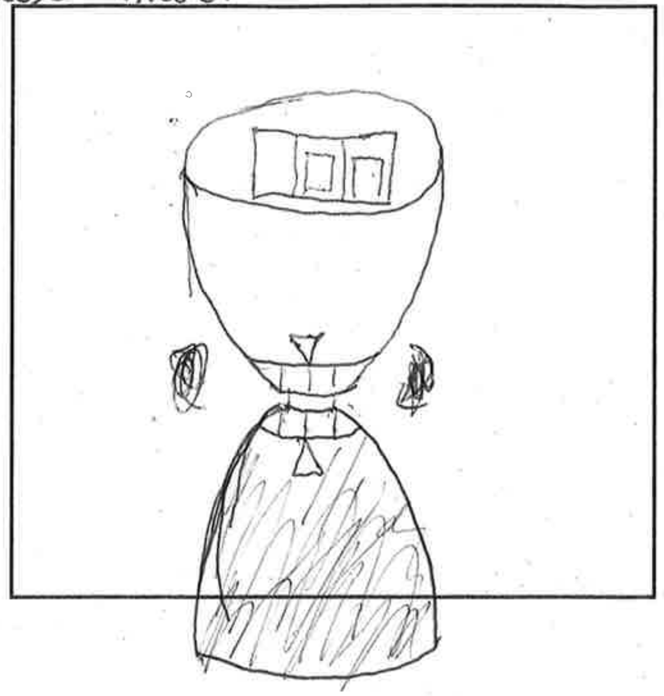


place ball in slot actuates that Pase ~~Setting~~

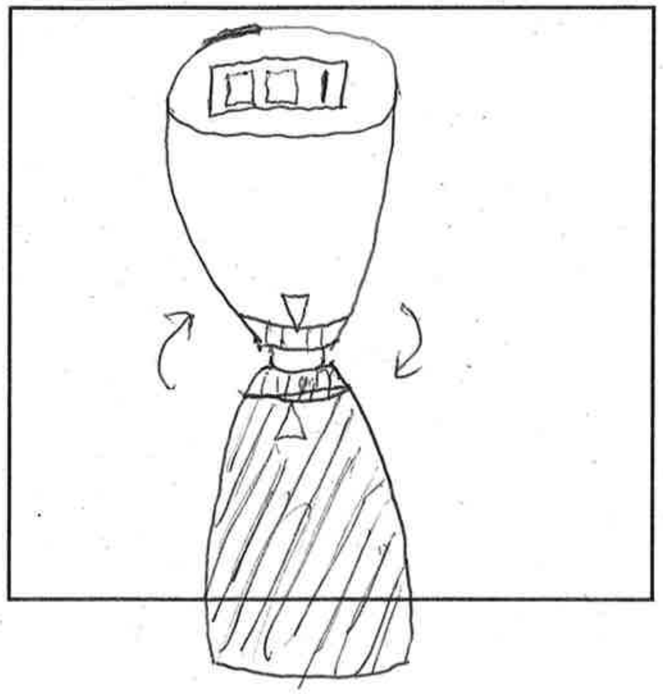


reset has the device rotating so that the ball falls out into the tray.

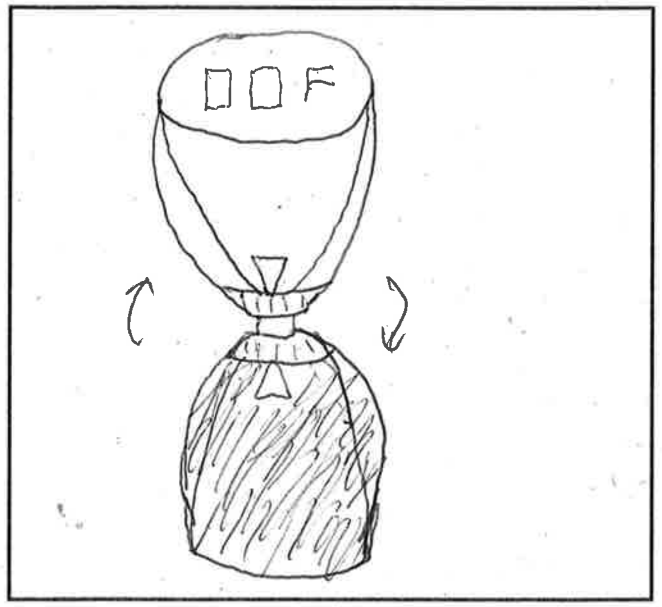
Pause mode.



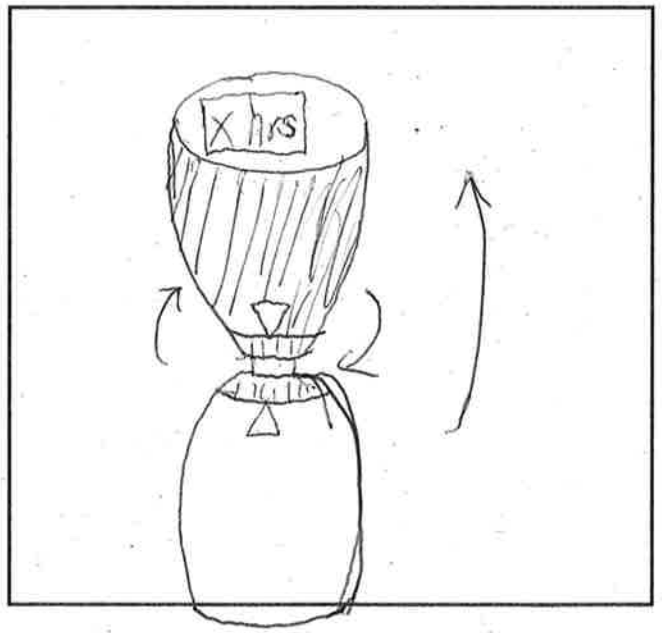
Non-interactive

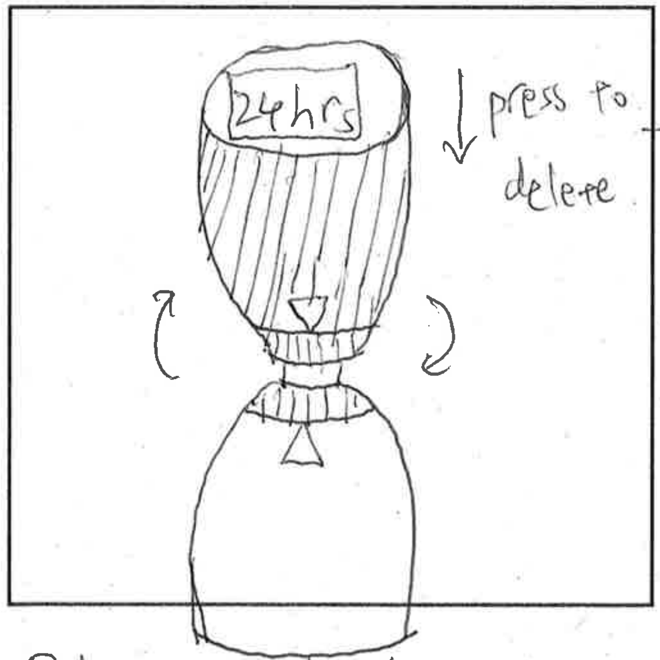


Pause } 1 hr
rest of the day



pause forever



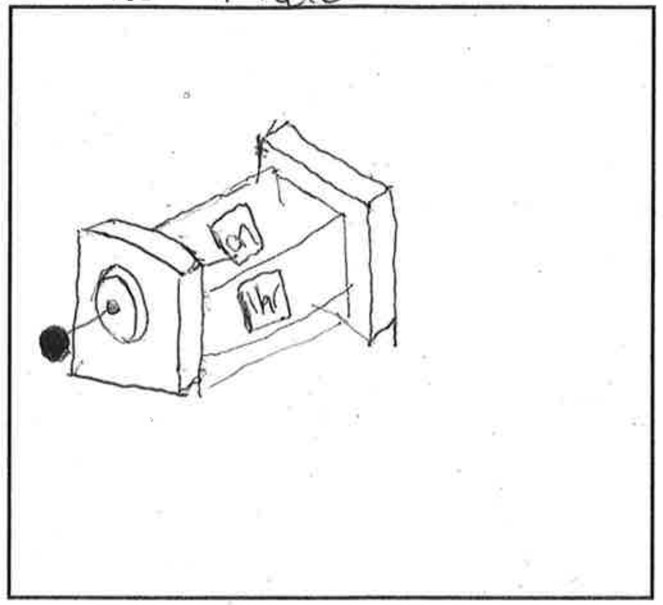

24hrs
press to delete

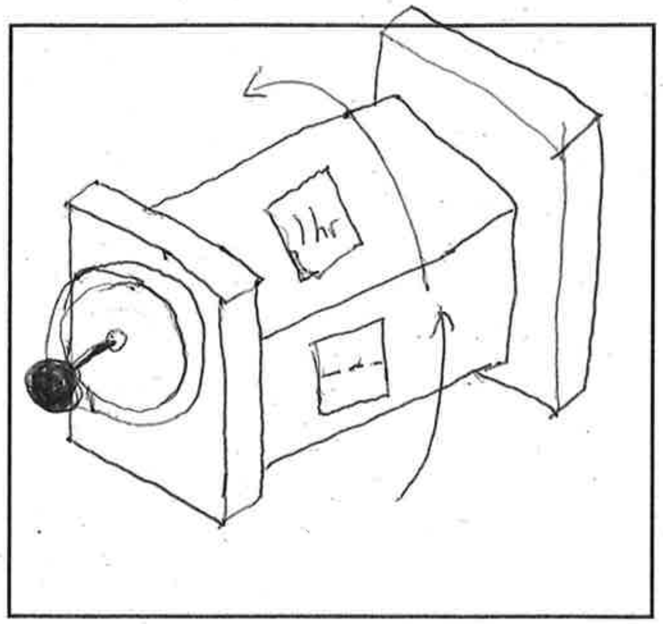
File shredding notification.
haptic feedback ?

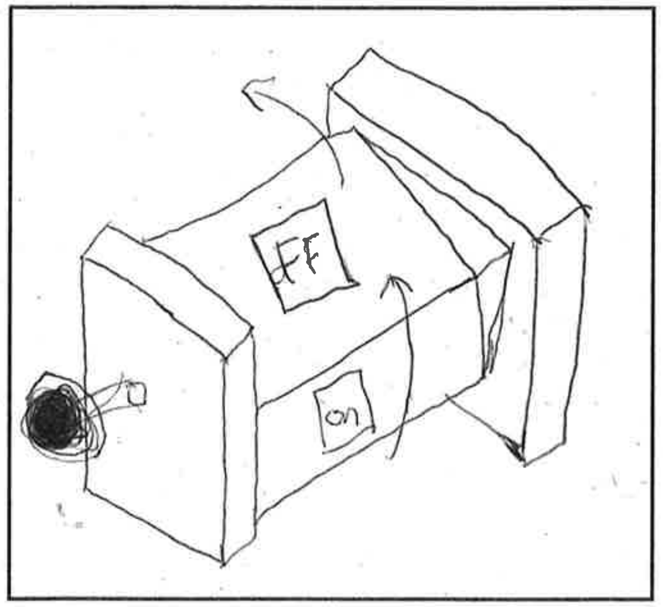
Delete mode.

Delete: 24 hrs (past)

Pause mode



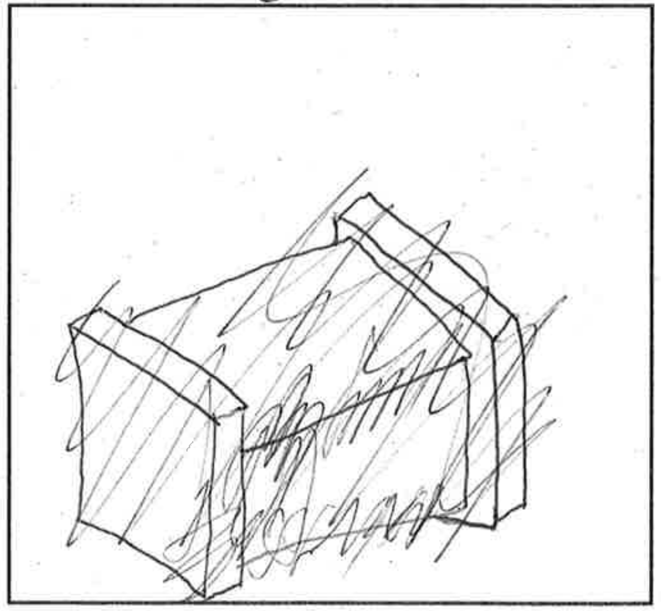


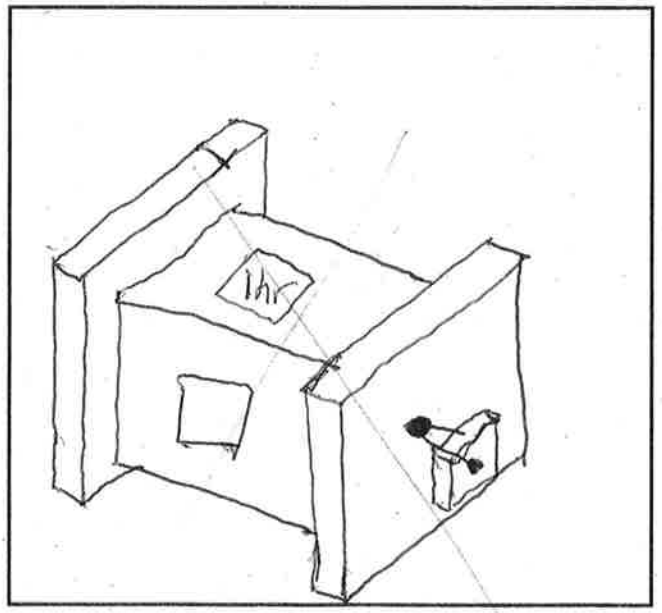


non active

pause for 1hr
rest of the day

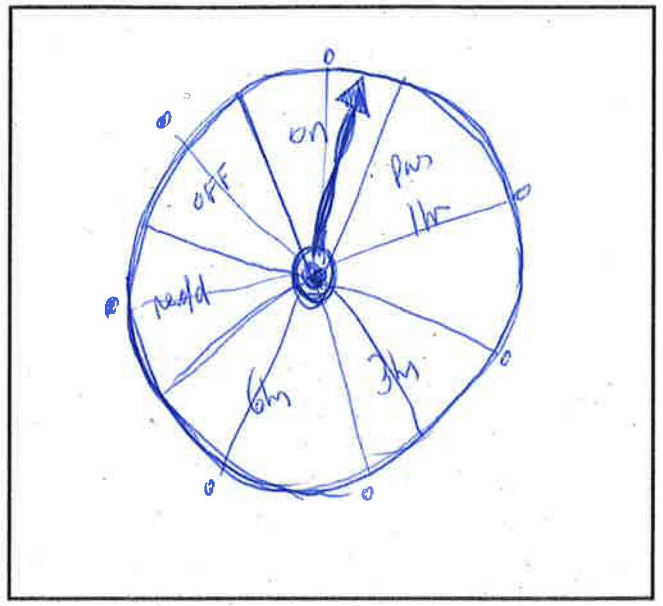
Delete mode



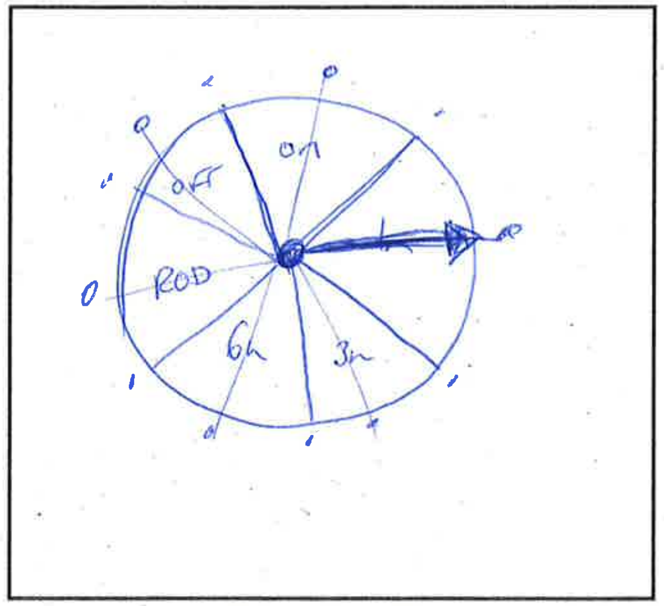


clock dial selector

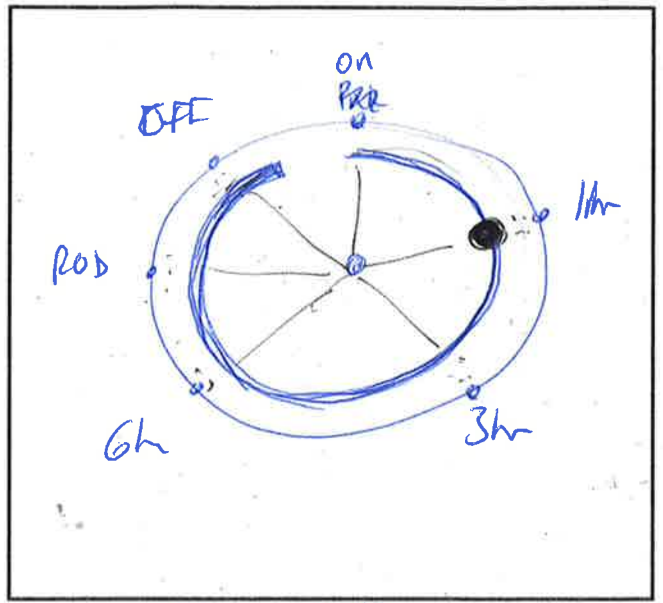
not interacted with.


on
off
paus
1hr
read
6hr
3hr

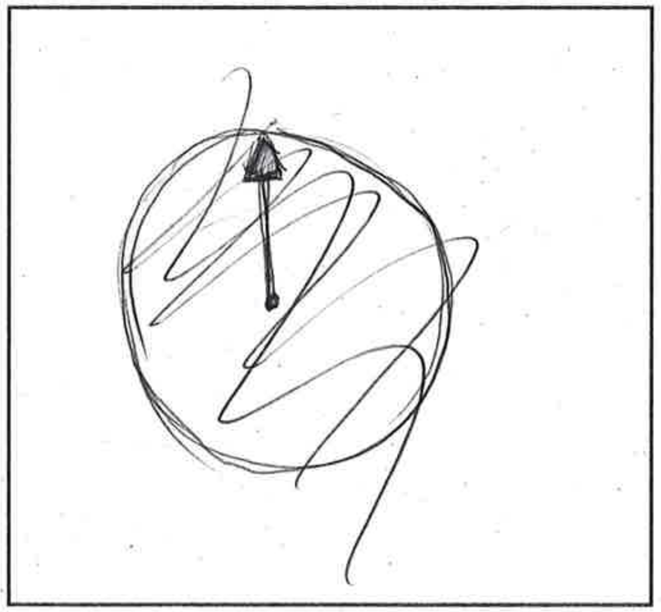
clock handle is set to on,
therefore the system is on.


on
off
ROD
6h
3hr

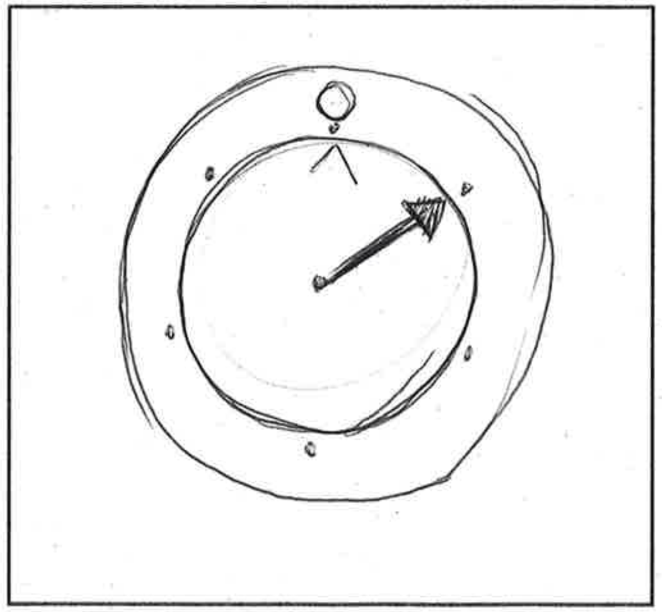
move handle to 1hr an then
the handle slowly moves back.


ON
PAR
OFF
1hr
ROD
6hr
3hr

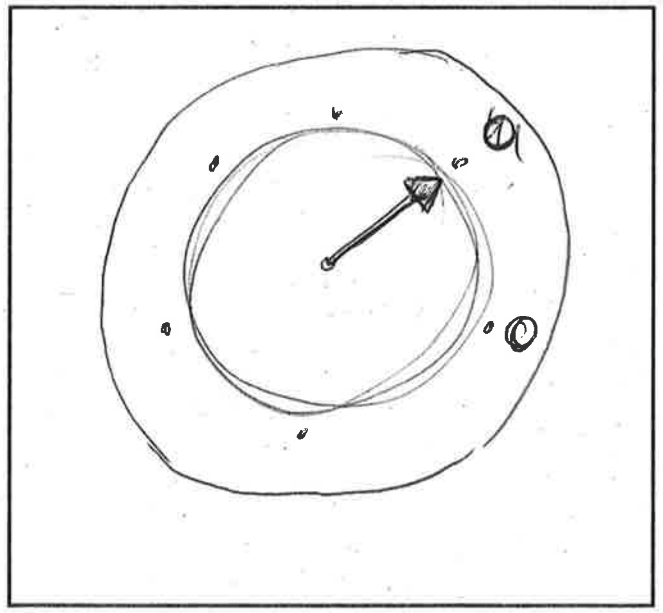
Idea of the clock
face. for blind...



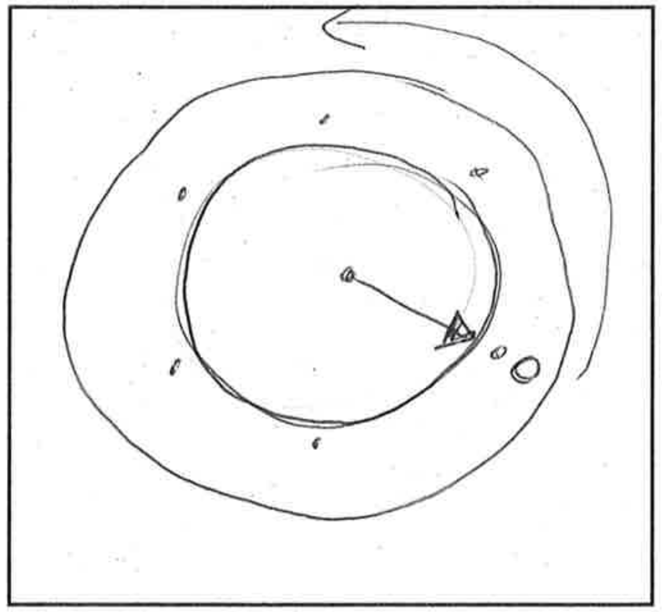
not intracted with.



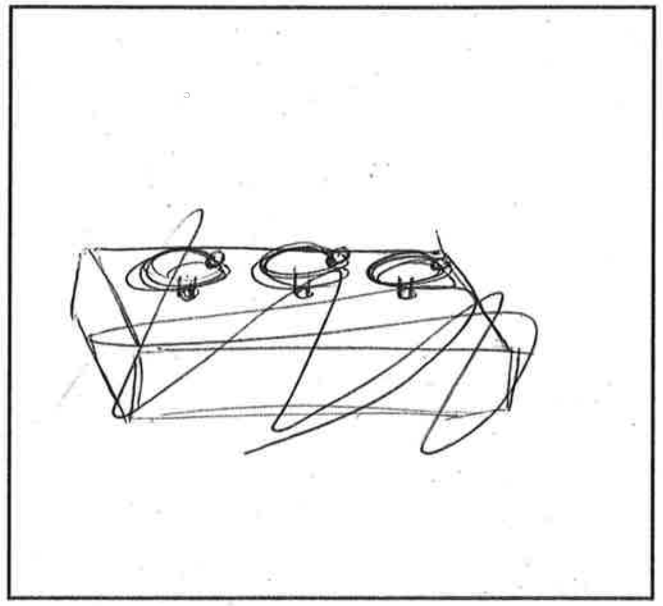
clock shows time.



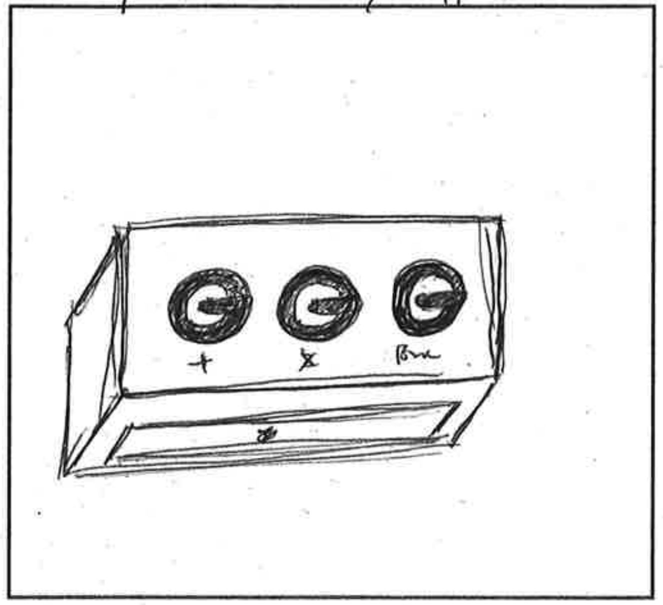
~~Set to~~ move out side
rim to ~~[illegible]~~ time you
want to pause till.



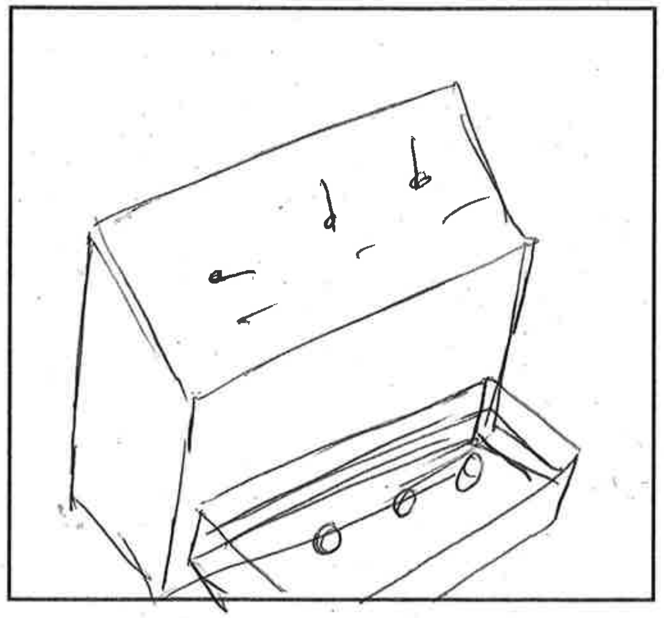
once clock reaches that time
the dial is reset to 12.00.



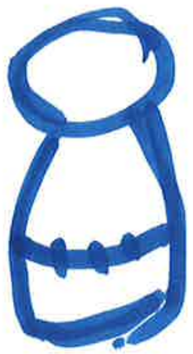
Tap turning on/off

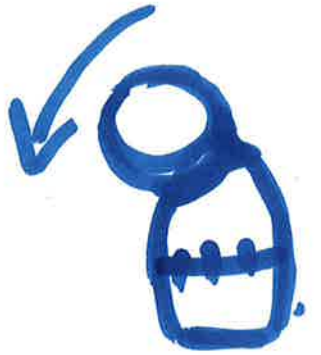


one would be able to
rotate at a time



①





rotate body

system is down.

haptic for blind...

↘ vibration. → setting finded

pause × × ☐

---

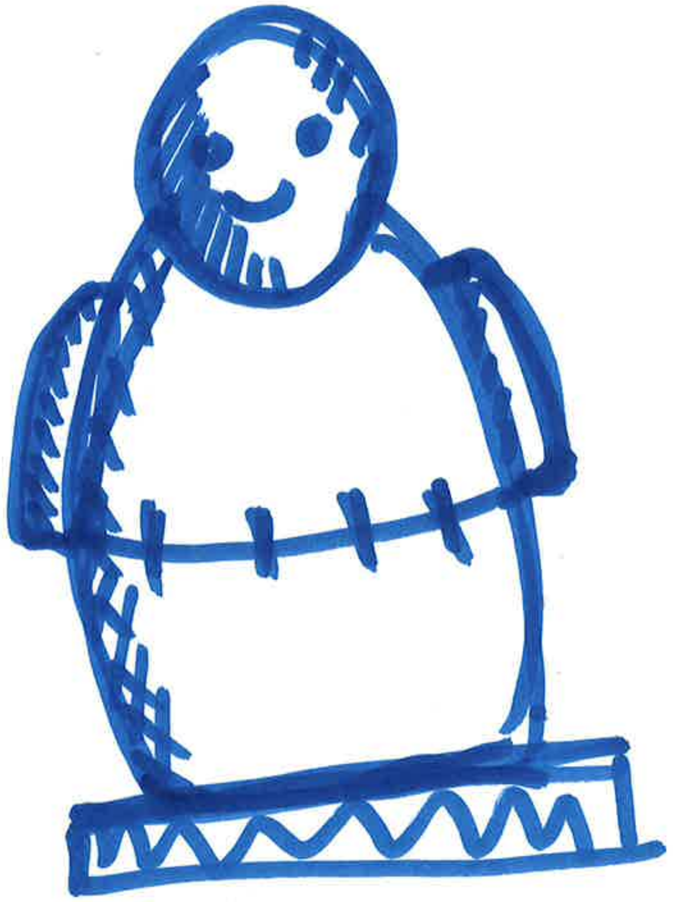
delete × × ☐

---

netbot stats. —

---

system on/off.



servo with a switch

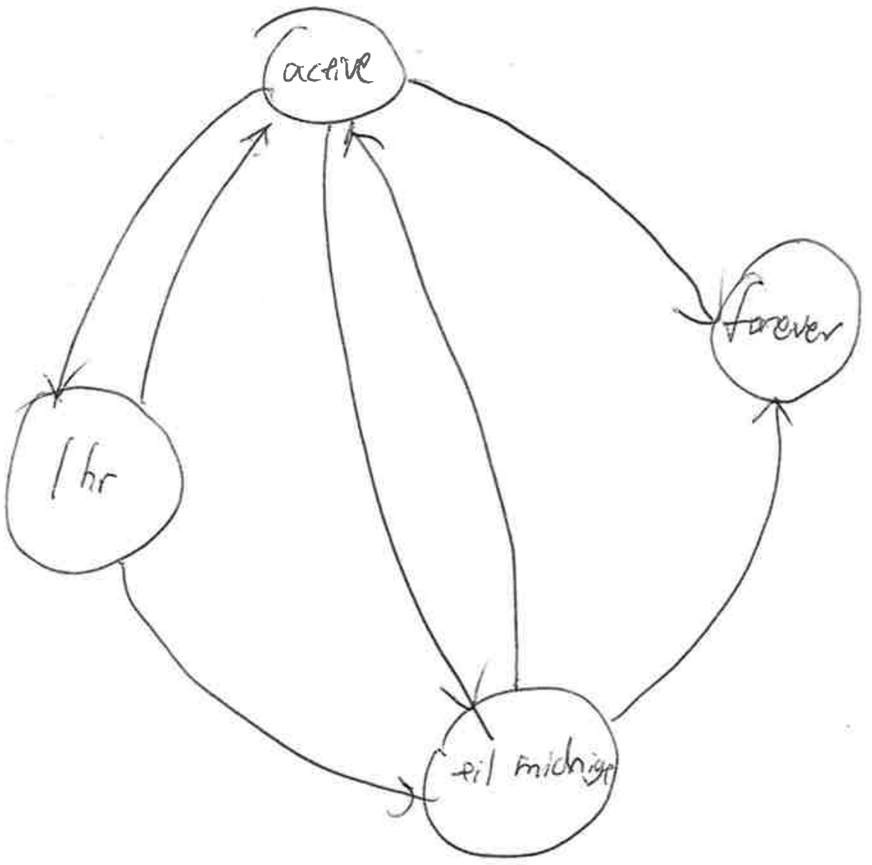
rotary servo with encoder. ← rotary mechanics

state machine.

↓

how many states ?

4


active
forever
1hr
til midnight

① pause

② delete

③ modula

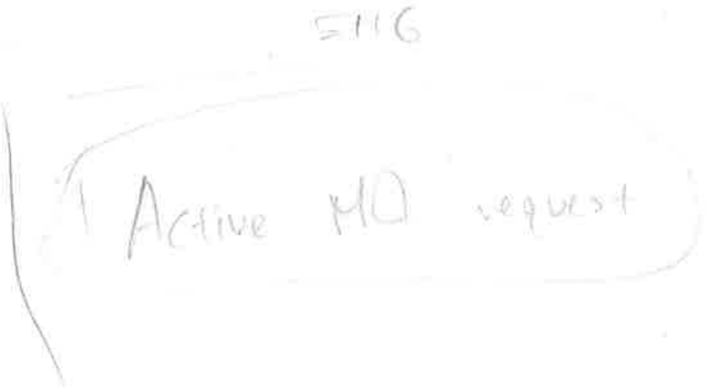
④ reflection (reflect different pause states)

notifications feedback (see Rachel's part)

activator panel ← linear mechanics

sphere or semisphere ?

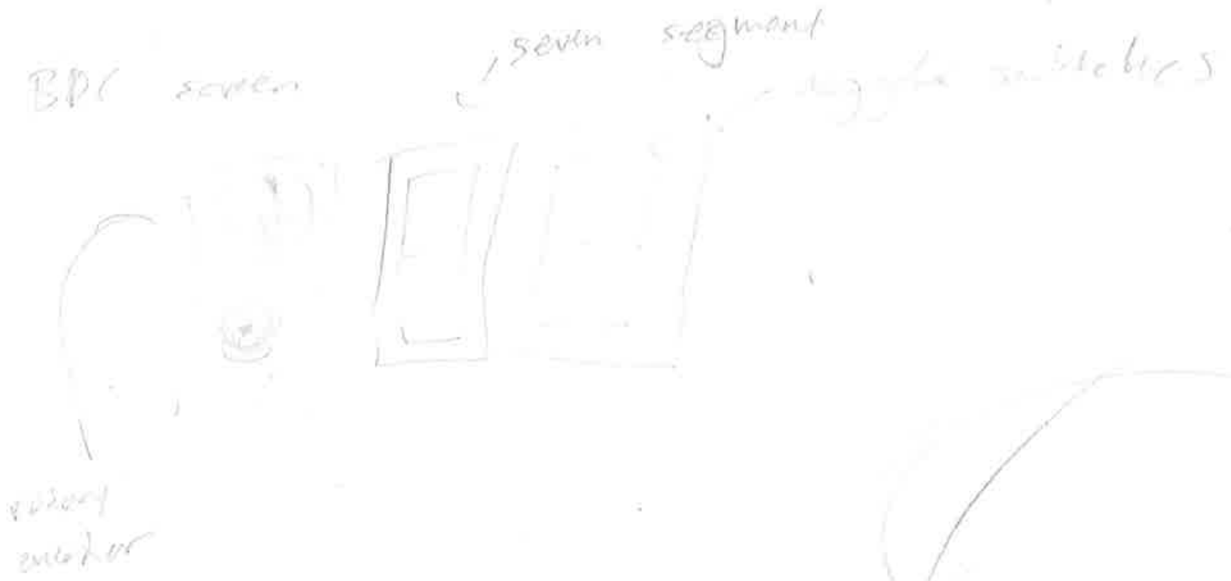
A box ?

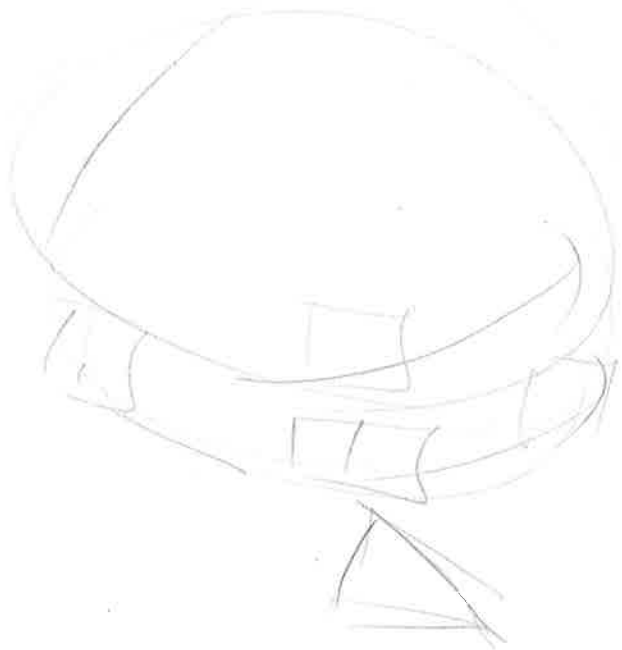

5116
Active MQ request

tablet
javab tomcat

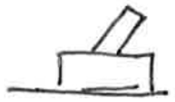
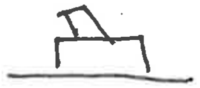
Rotary switches.

Pause is activated and returns after time out


BPC screen
seven segment
toggle switches
rotary encoder

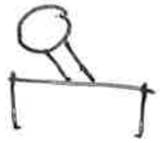


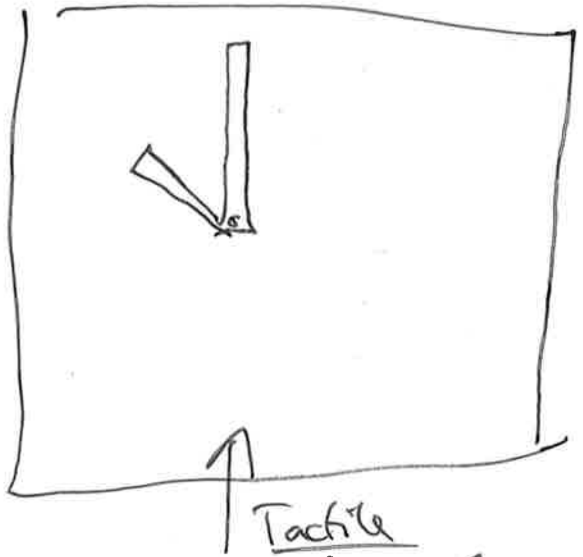
Physical toggles:

 or 

advantage: easy to read tactile feedback.

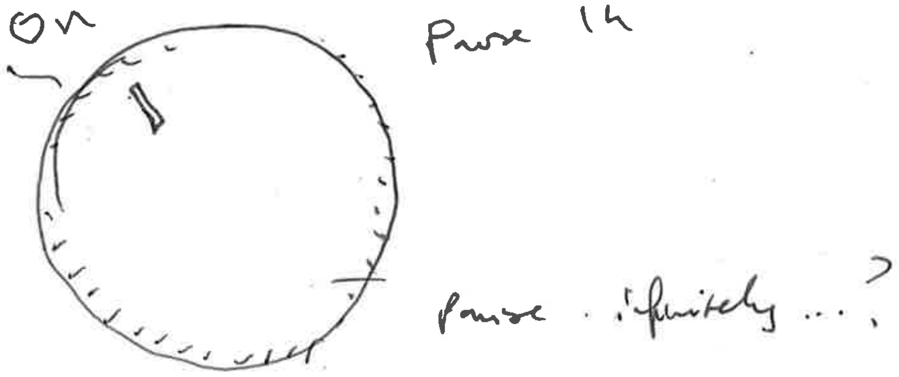
Disadvantage: how do you reset electronically.

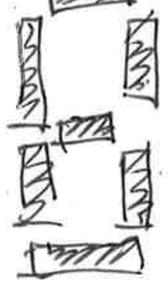
(or more comfy toggle  ie easier to grasp/move.)

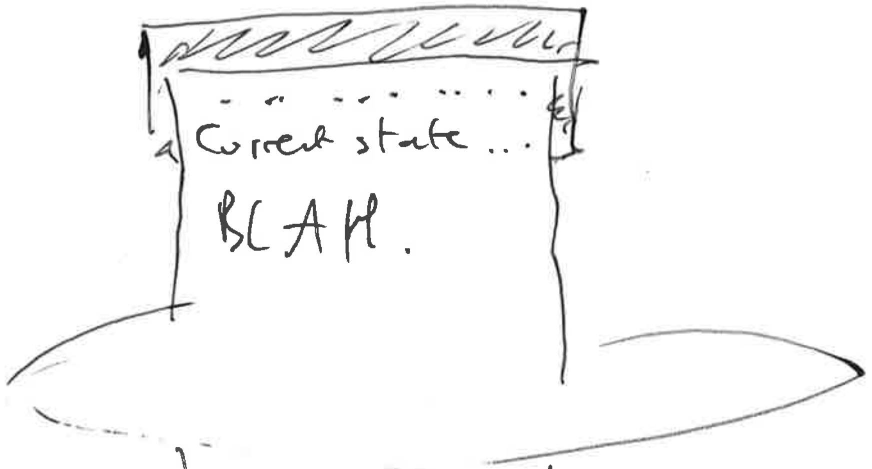


Set clock face to when you want the system to stop.

Rotary


On
Pause 1h
pause infinitely ...?

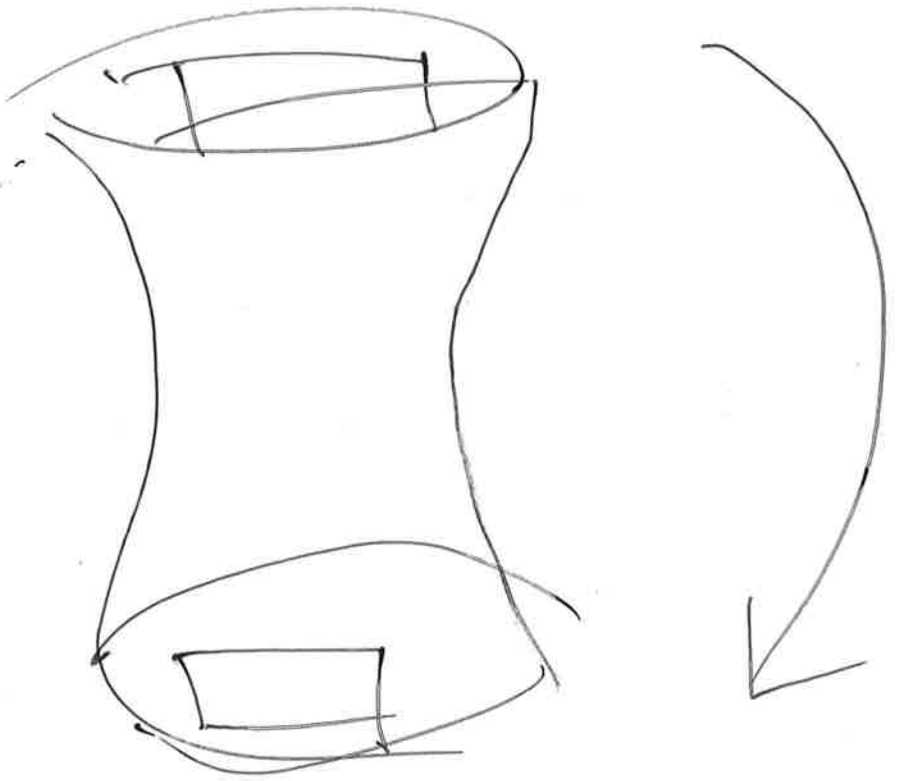


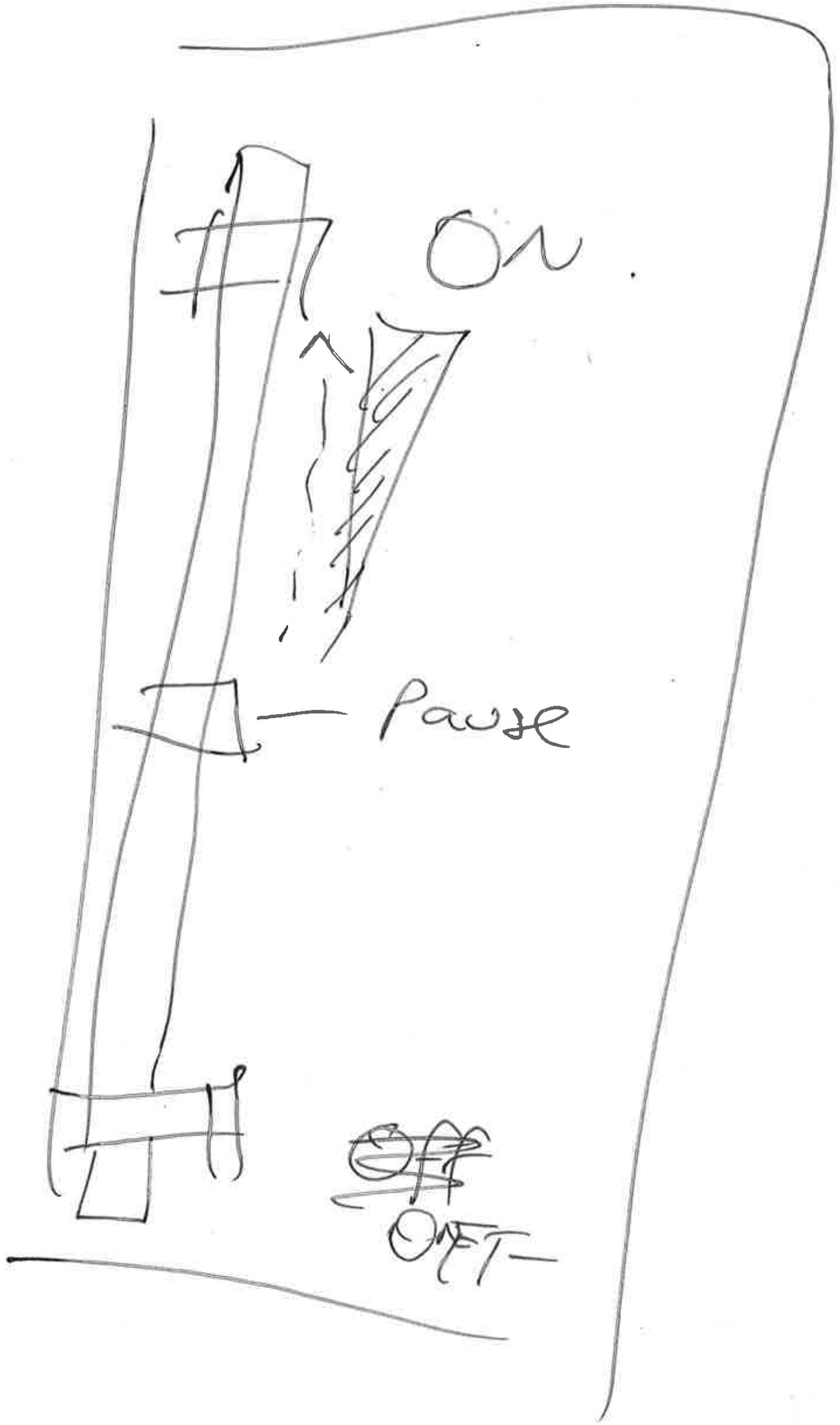

Current state ...
BLAH.

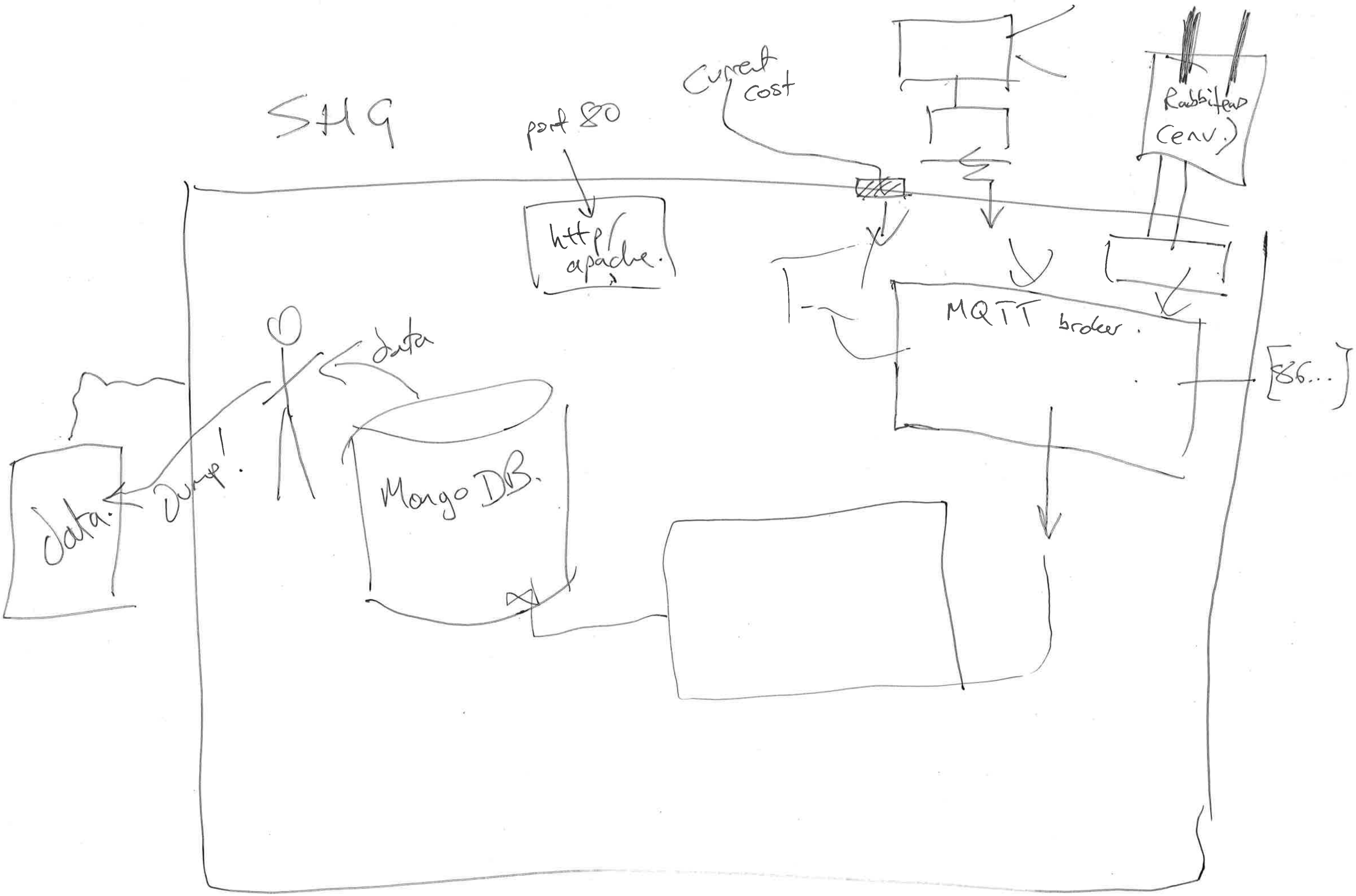
drops into bin!

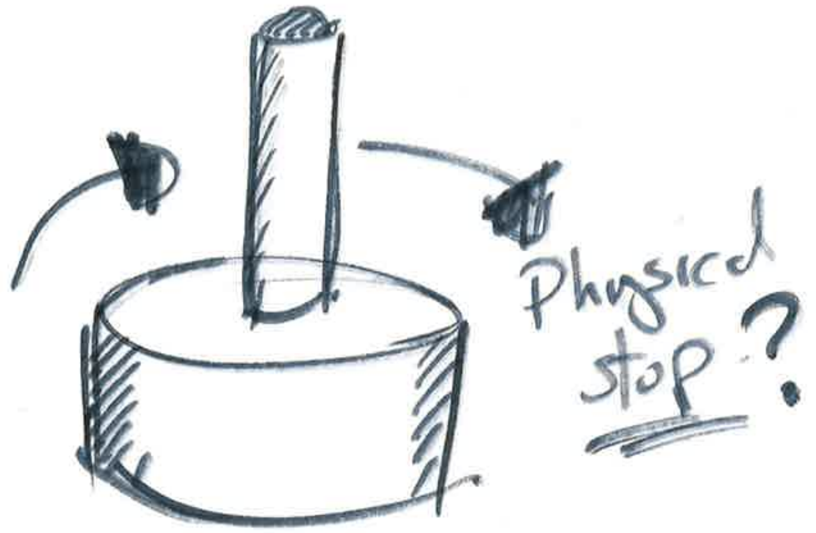
Fitts' Law:

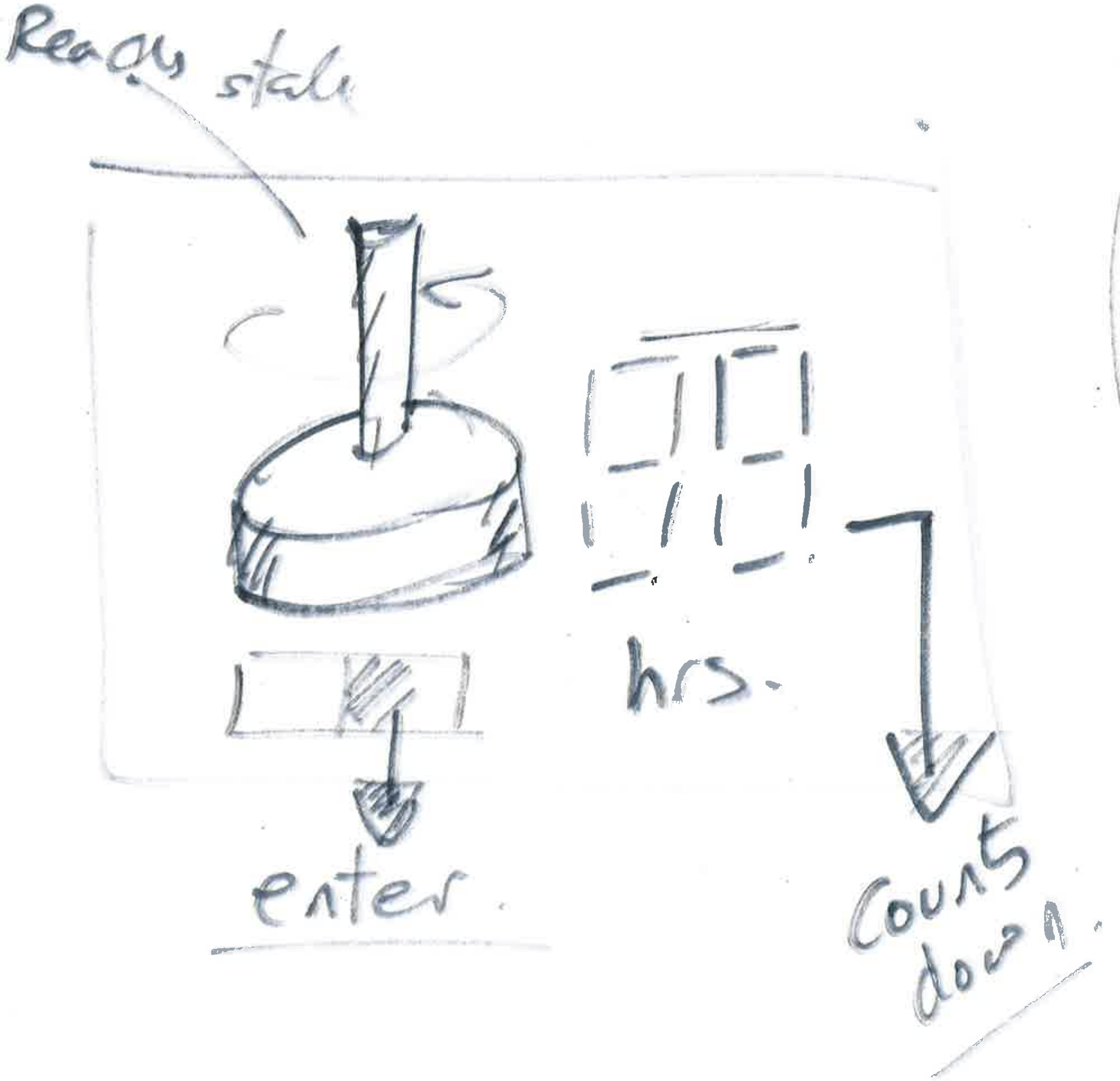
"buttons placed on edge are easier to hit than anywhere else."

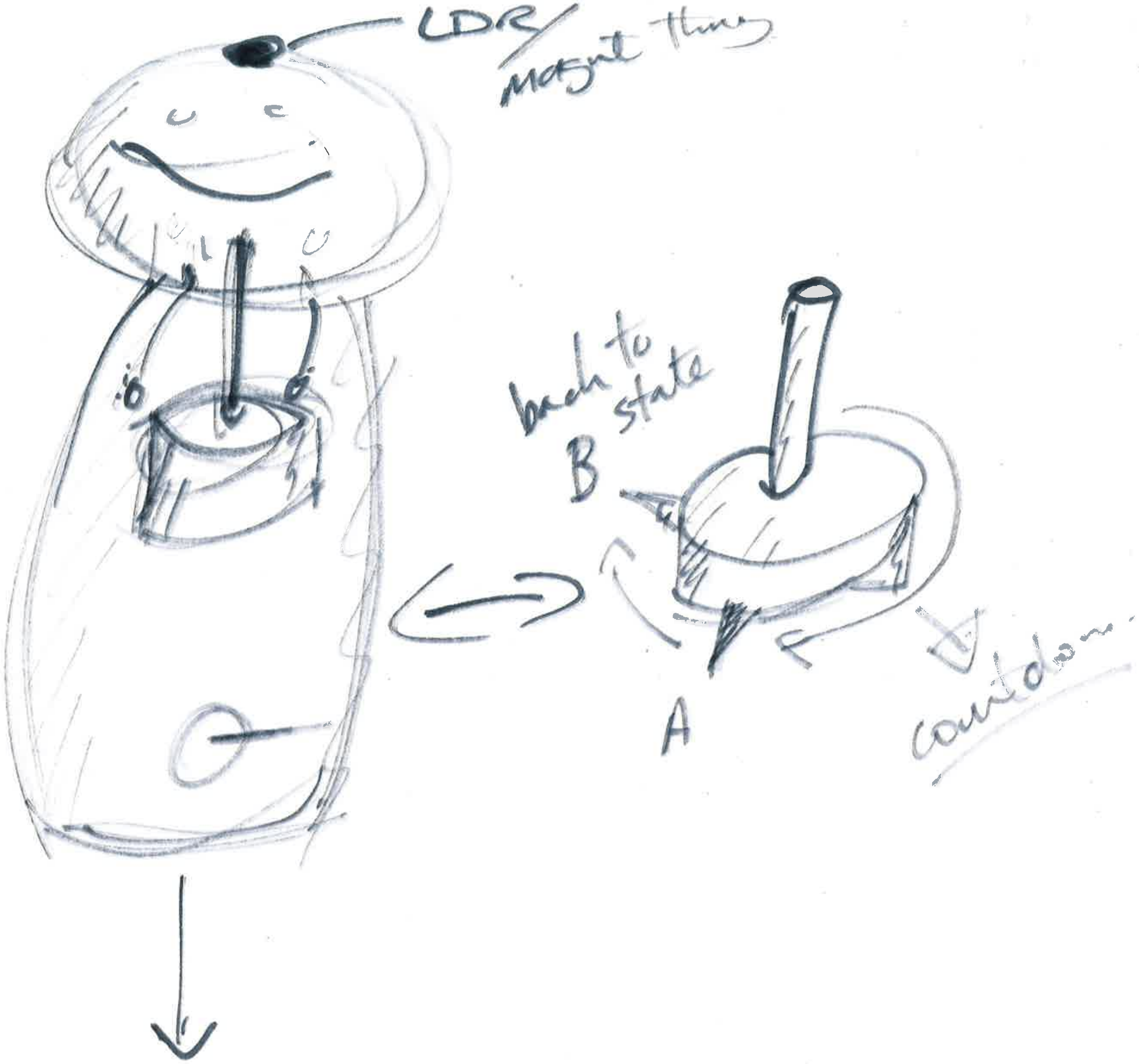


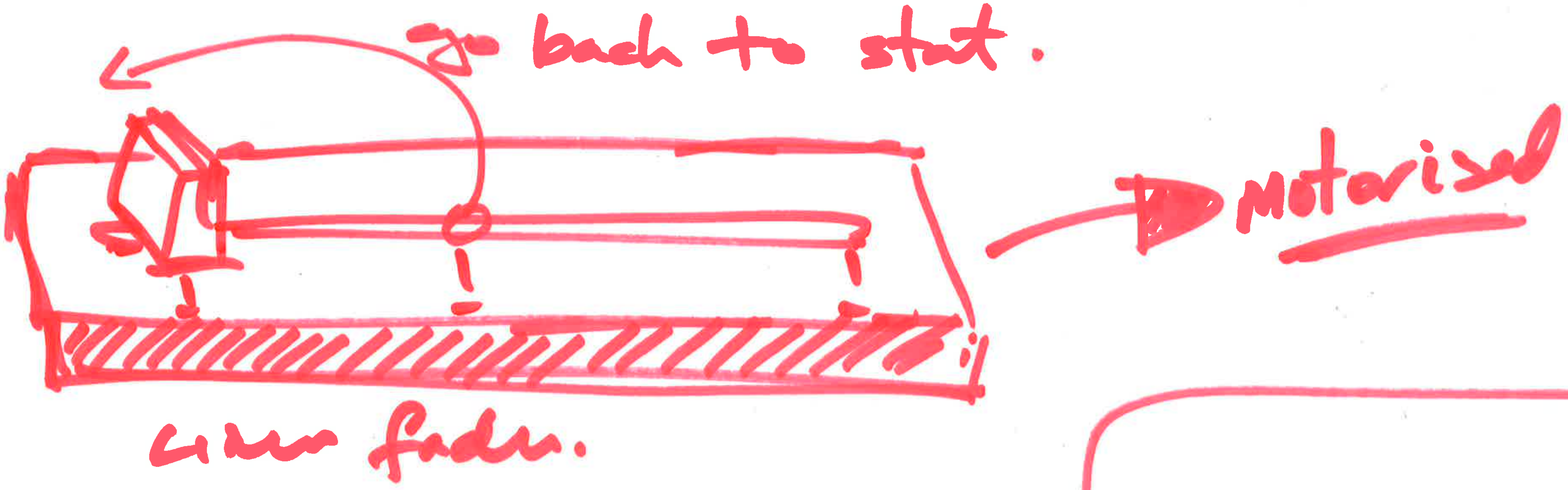

On
Pause
~~Off~~
OFF

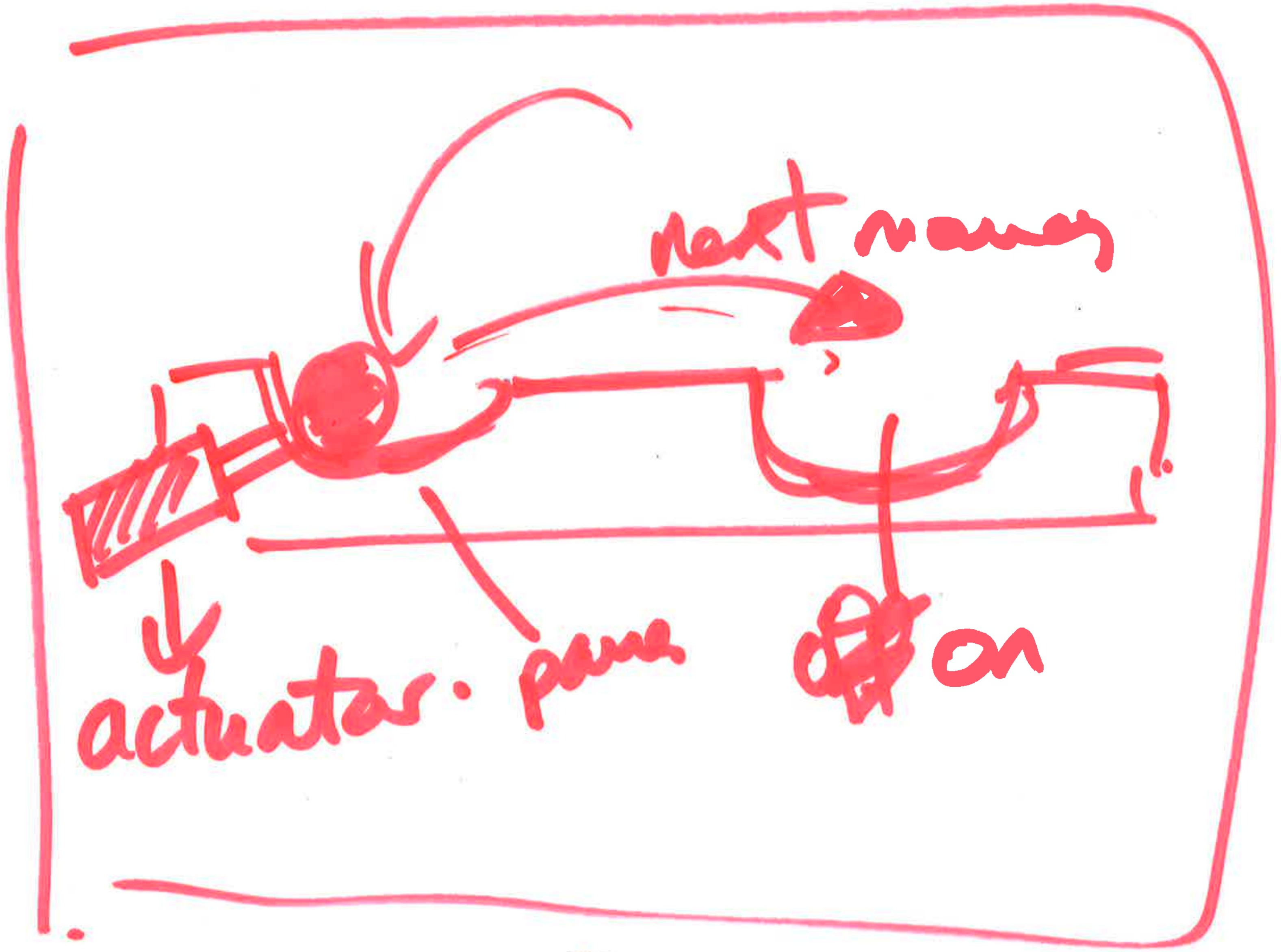

SHG
port 80
http/ apache.
Current cost
Rabbitears (env.)
MQTT broker.
[86...]
data
Dump!
data.
MongoDB.

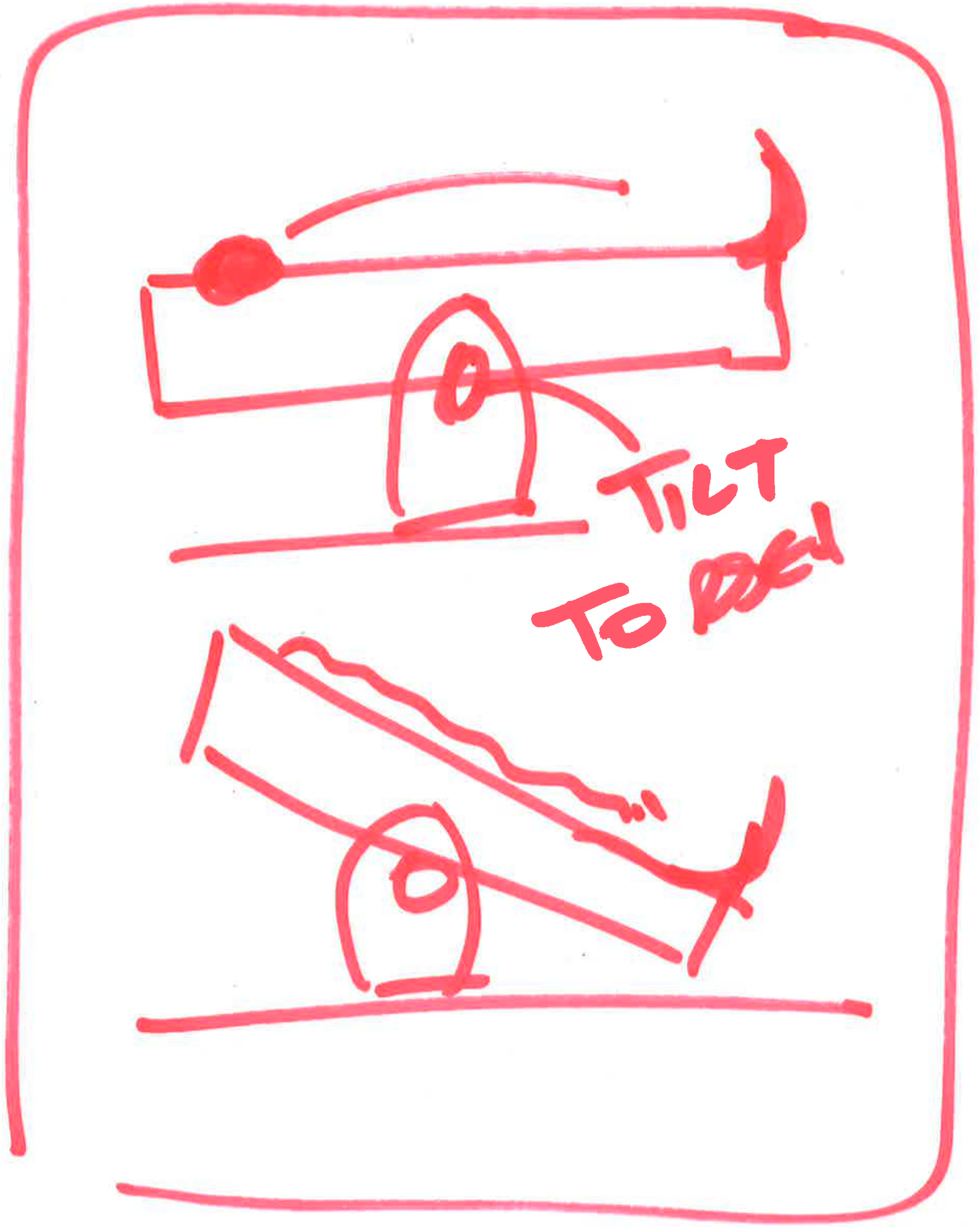

Physical stop ?

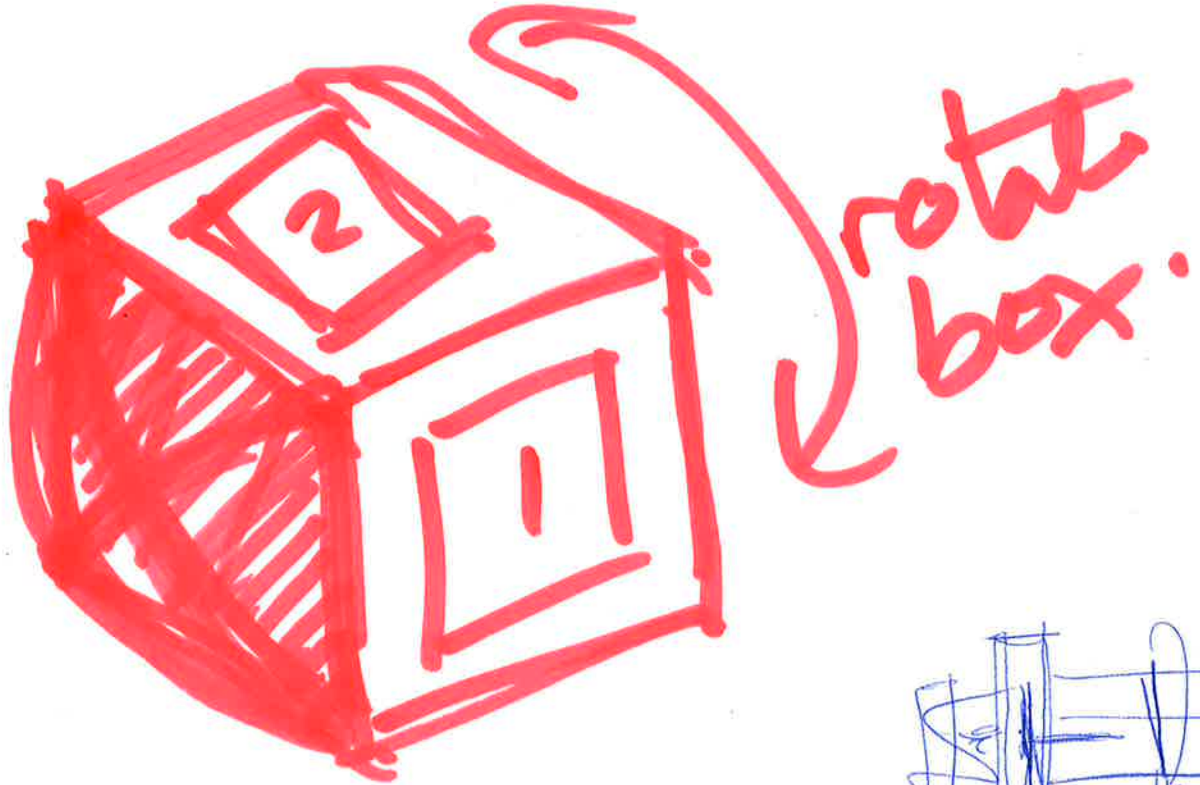

Ready state
hrs.
enter.
Count down.

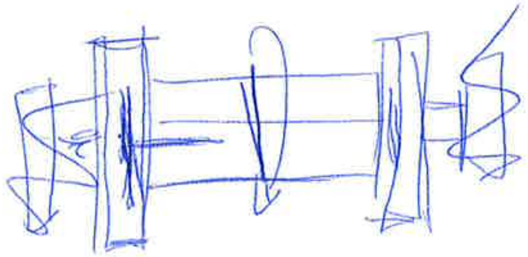

LDR/ Magnet thing
back to state B
A
countdown.

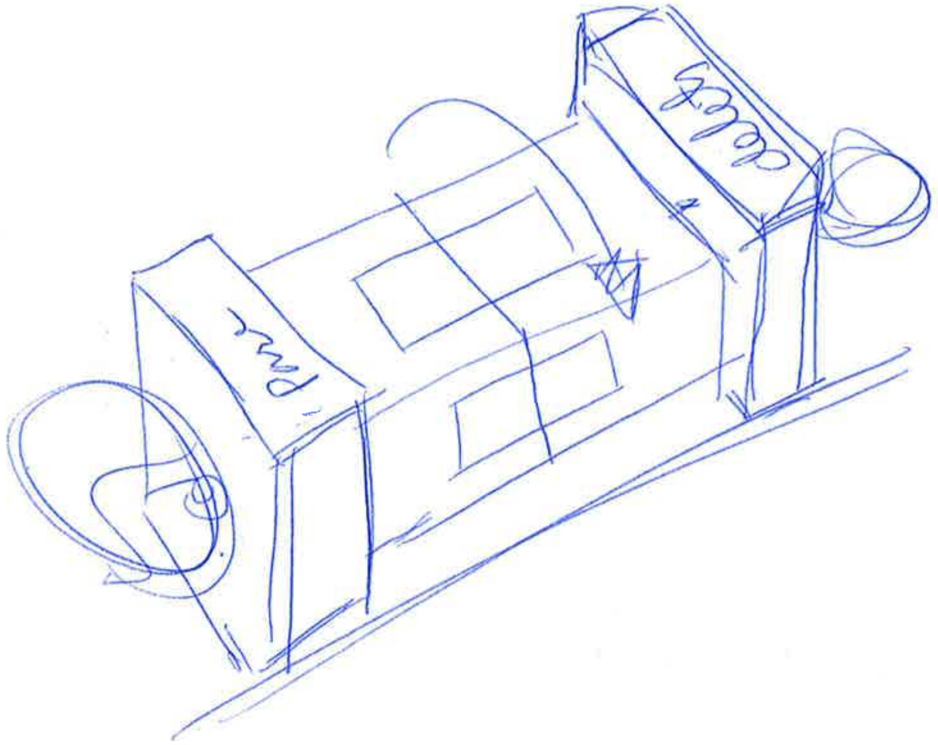

go back to start.
Motorised
Linear fader.

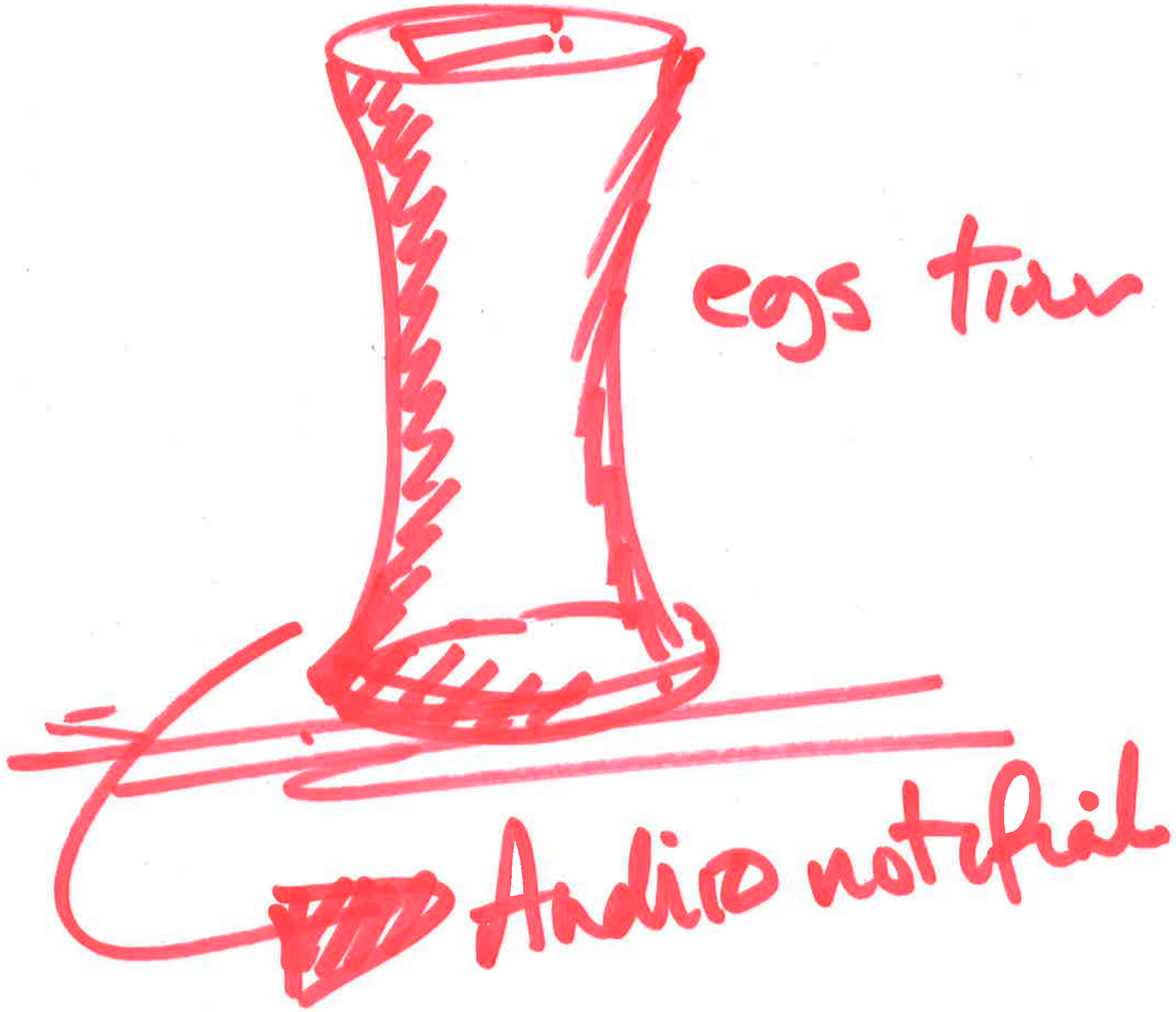

next money
actuator.
pause
On

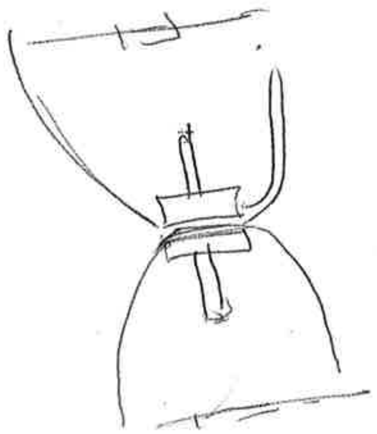

TILT
TO BED

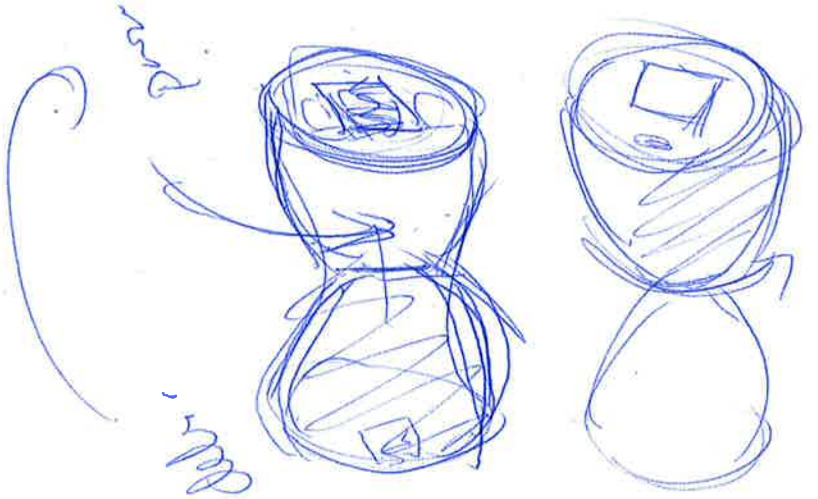

2
1
rotat box.

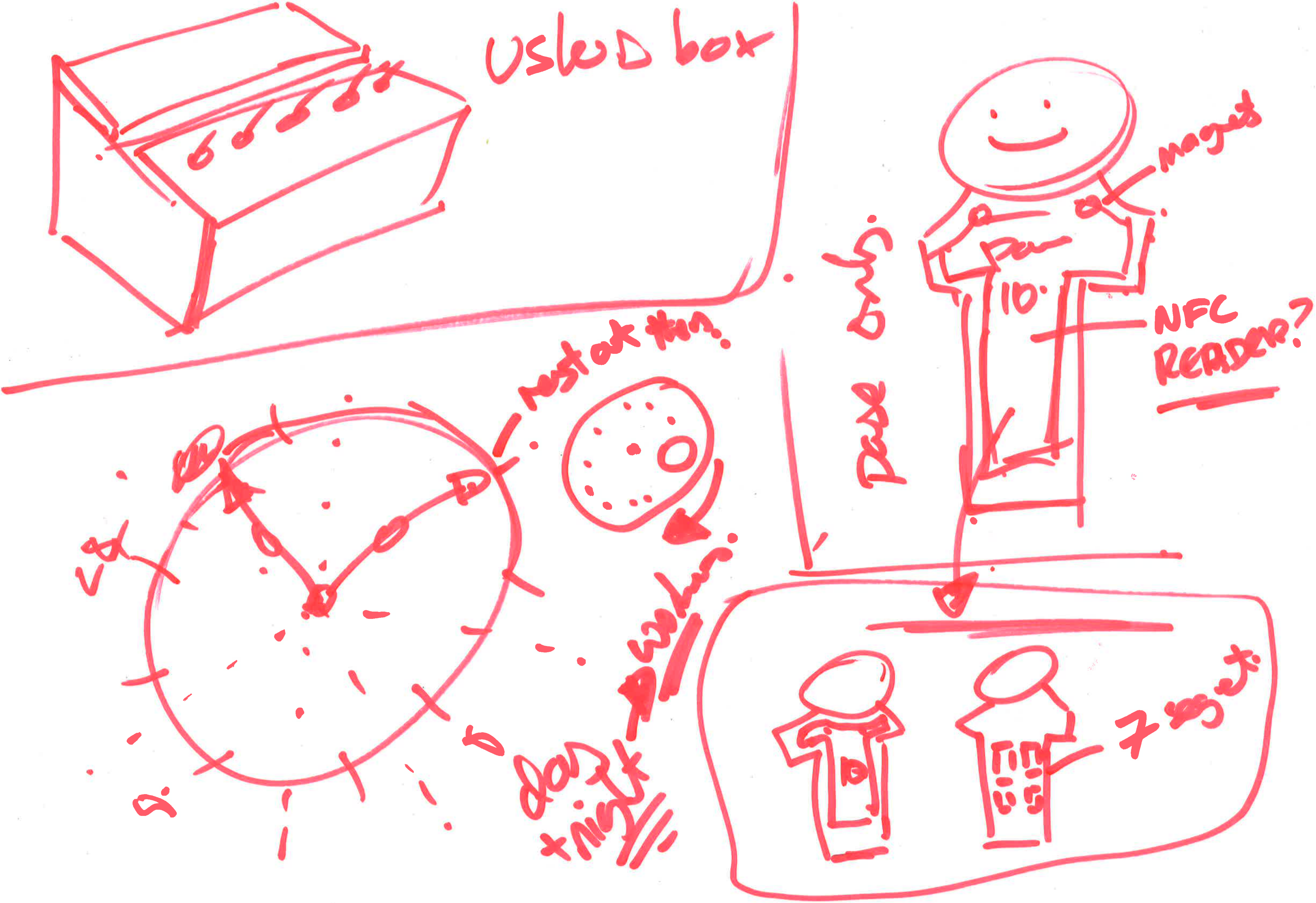


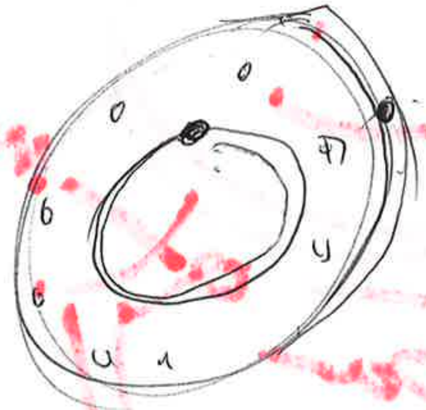

Pau
delet

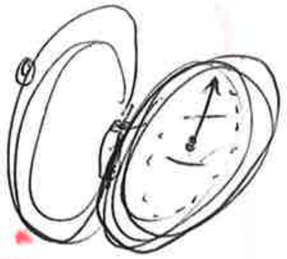

egs timer
Audio notifial

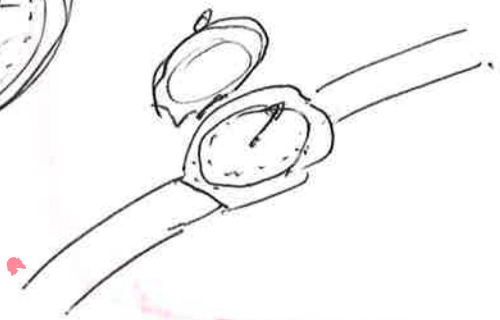


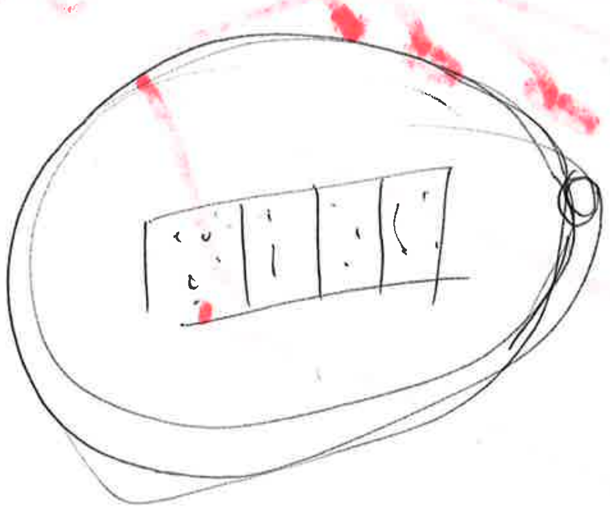

Pau
delet

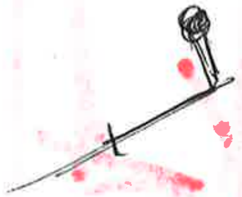

USLED box
Dave only
magnet
10
NFC READER?
next ok then?
vol
volume
dots + nos
10
7 segment

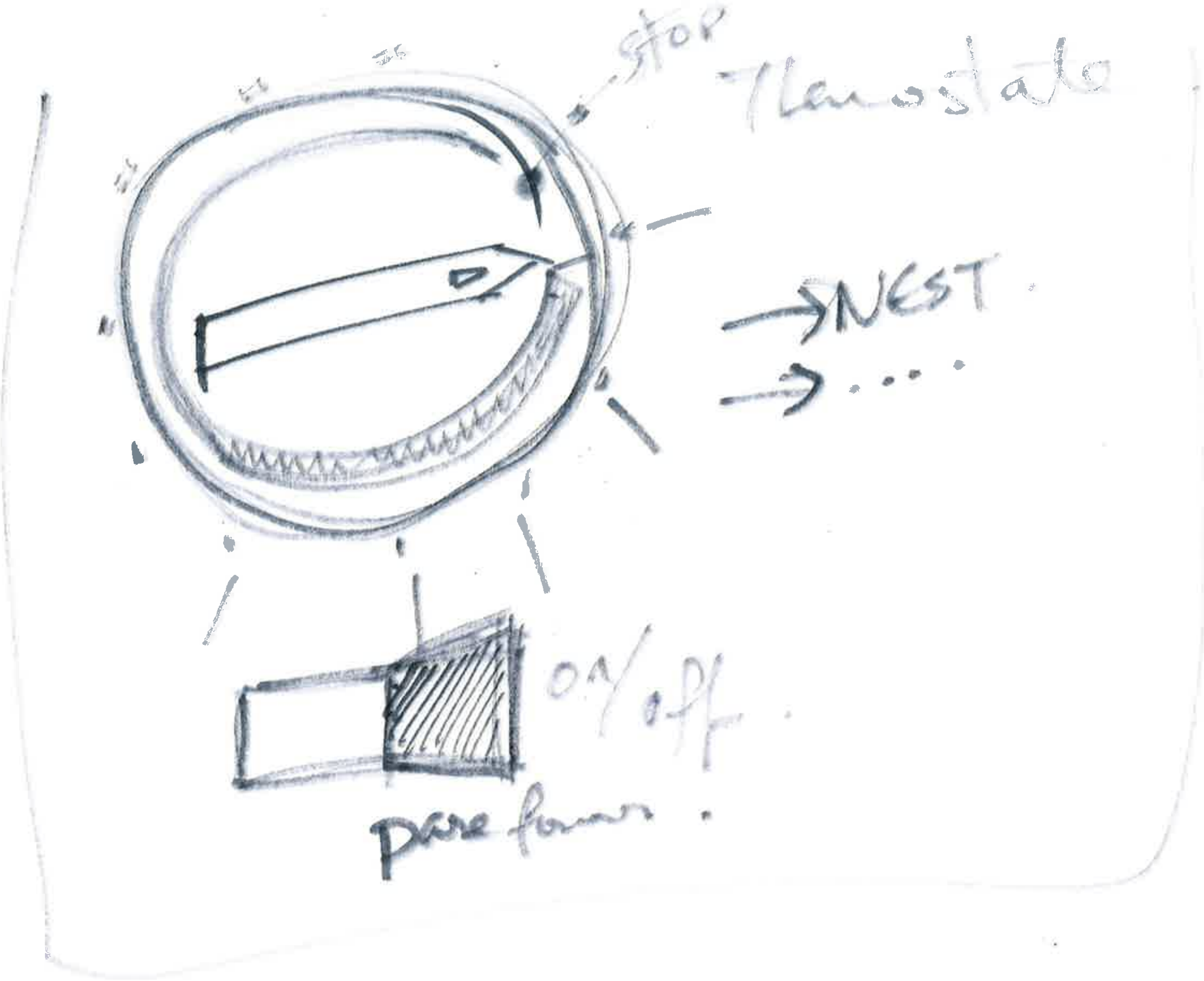




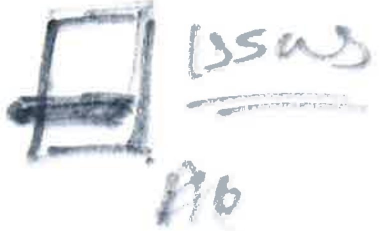


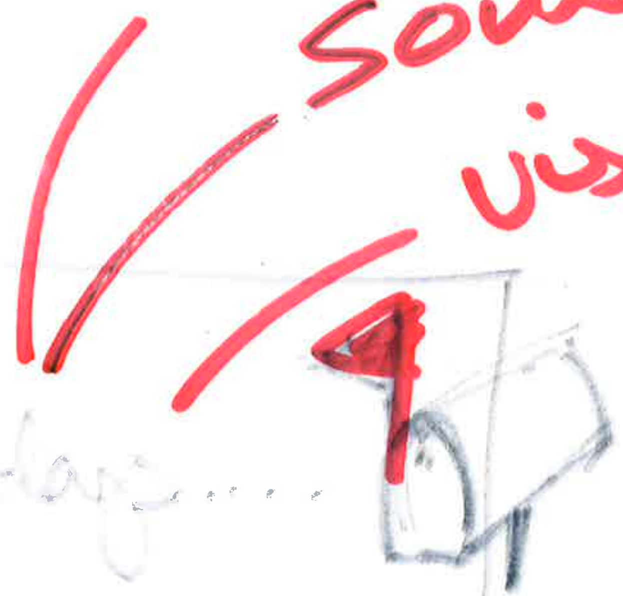





stop
Thermostat
→NEST
→ . . . .
on/off
pure form.

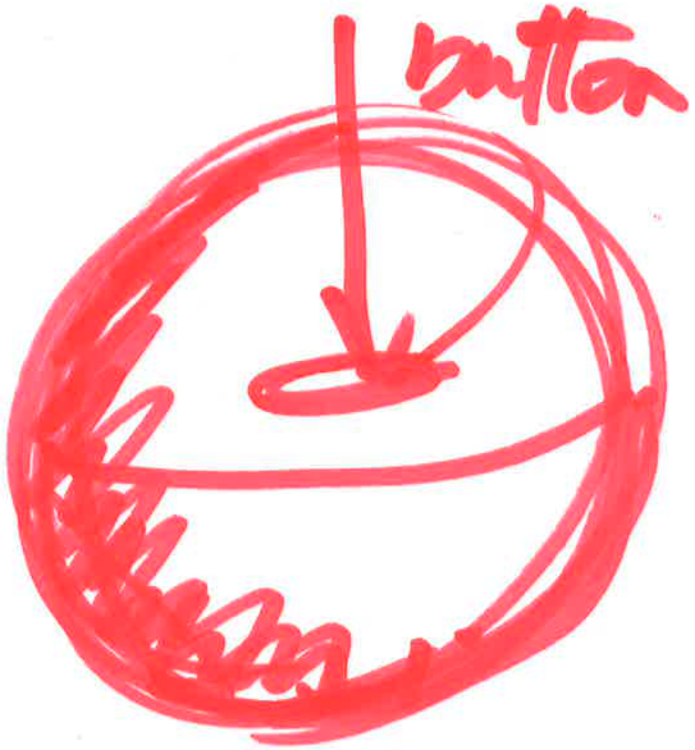
fake — turn off





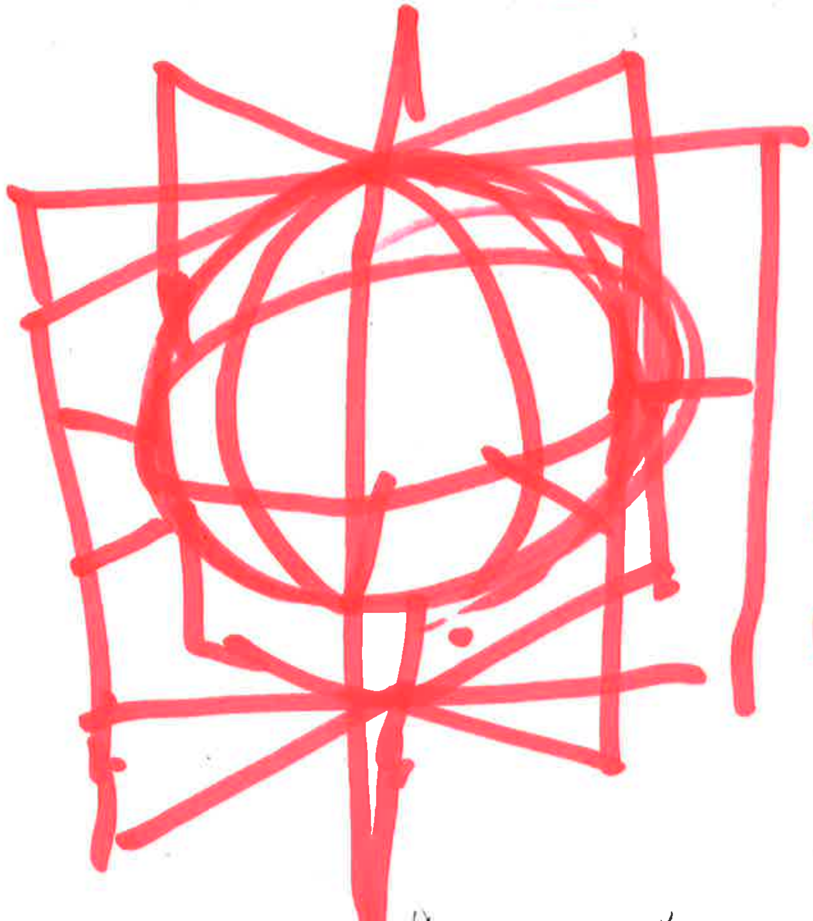
Pops up somewhere.
Sound or music
visual.

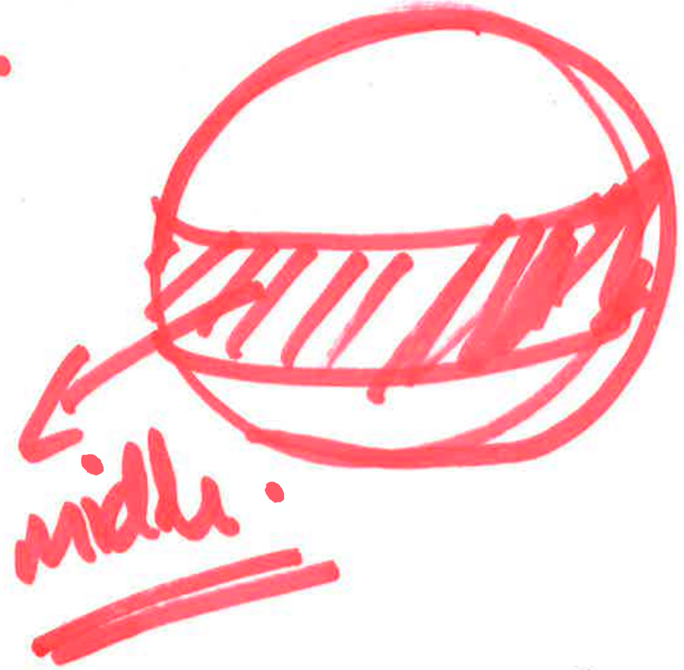
NOTIFICATIONS? been off for days....

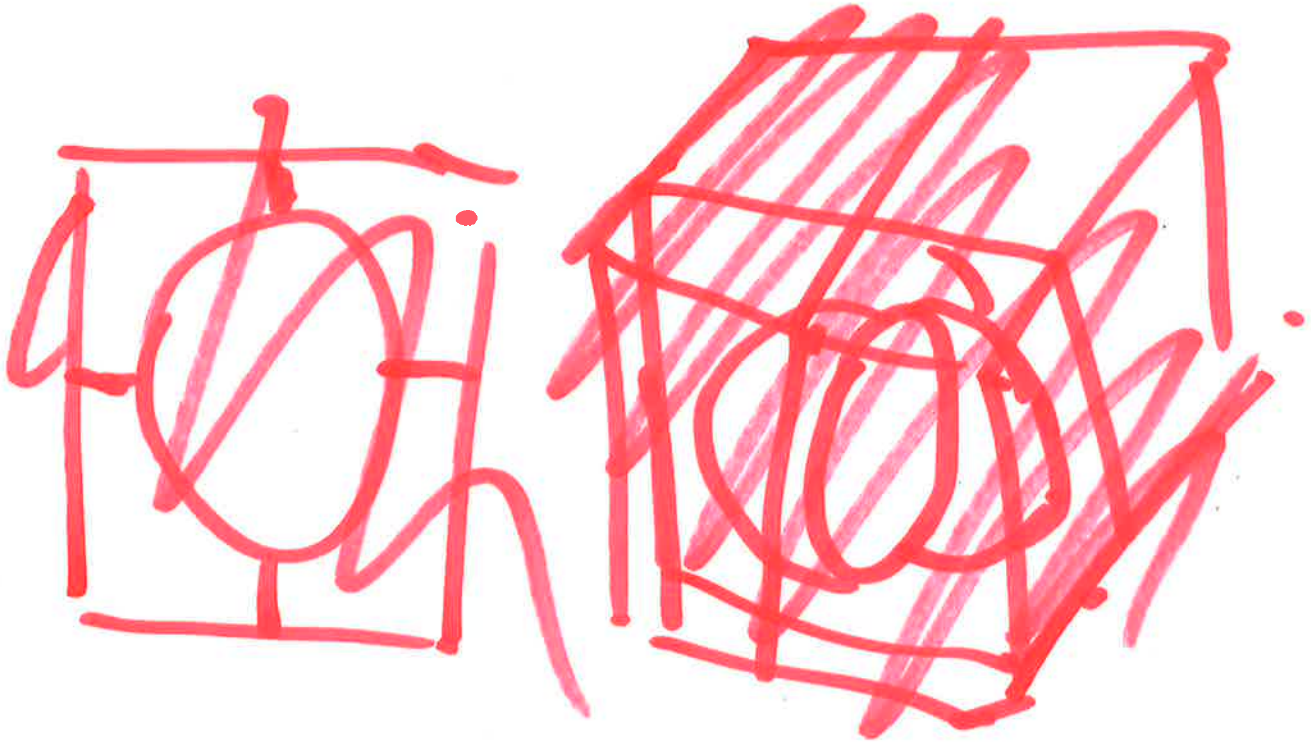


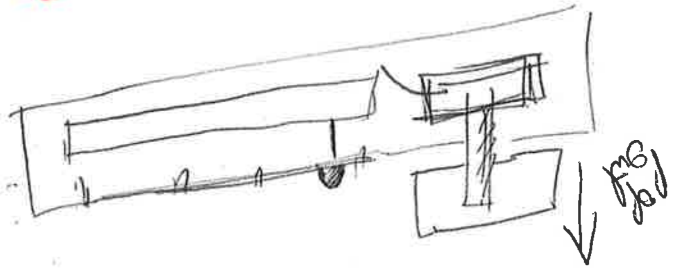
controller: is ball

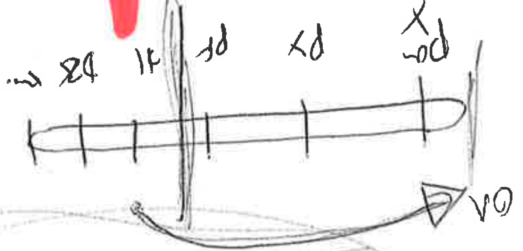
SPHERE: rotated sphere

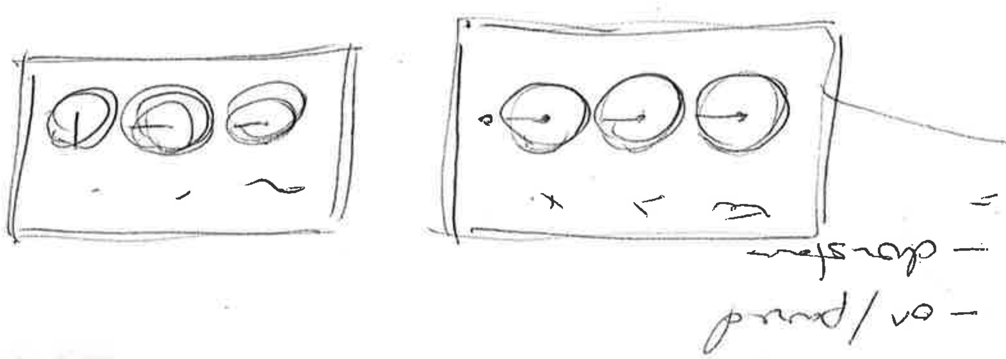


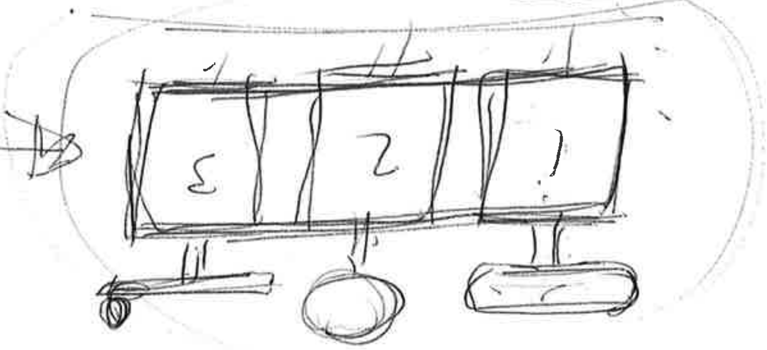


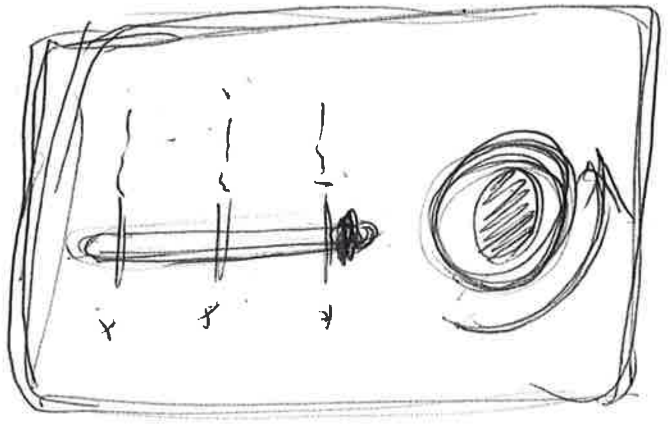












A button pressed on tablet screen

function : ~~f~~on button Press( ) { execute: send (button1 info) }

button1

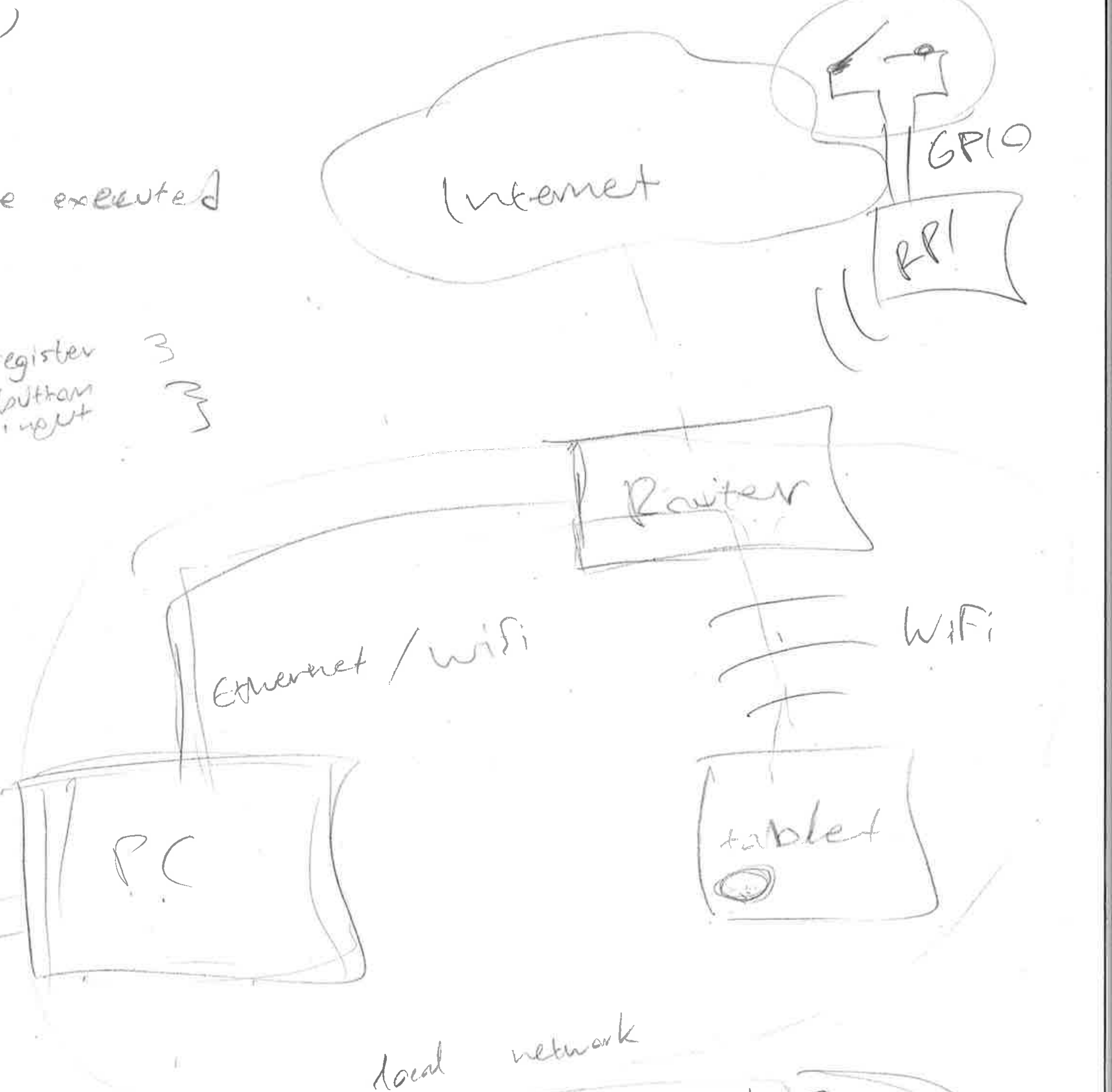
Event of button press generates a function call to be executed

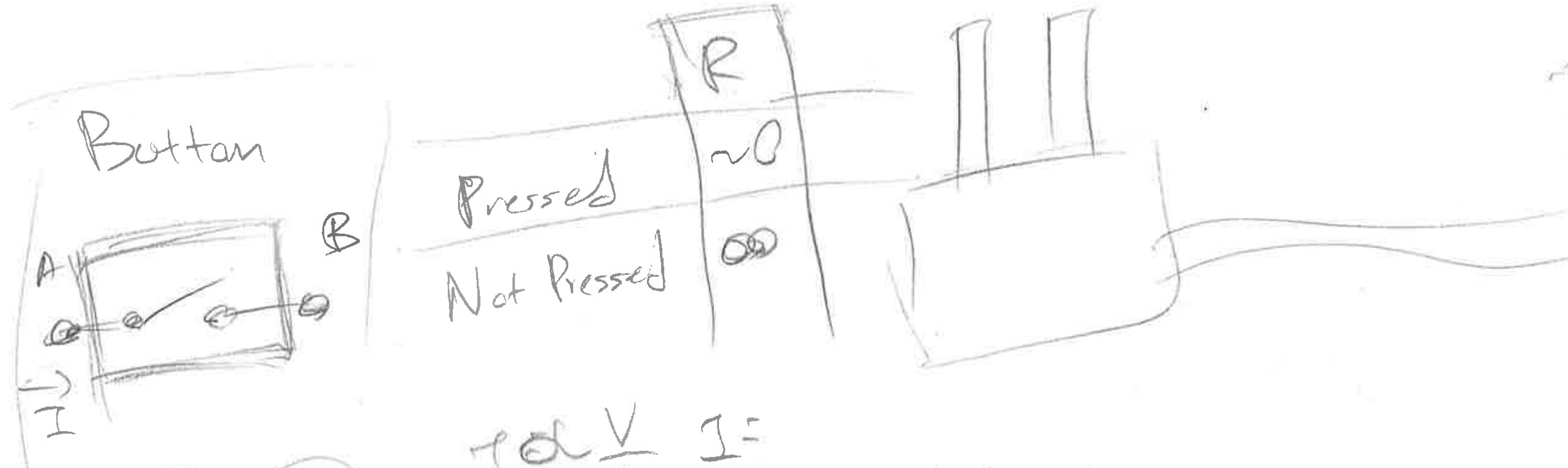
?

function : on_receive (info) { execute: if (button1) { register button input } }

PC registering button ~~call~~ press

The pc receives information. In this case the information is that a button is pressed.


GPIO
API
Internet
Router
Ethernet / wifi
WiFi
PC
tablet


Button
A
B
I
R
~0
∞
Pressed
Not Pressed

$V = R \cdot I$ $\quad I \propto \frac{V}{R}$ $\quad I =$

1

0

GPIO input

GND

sphere system

local network

PC Address → fixed

Tablet Address → xx

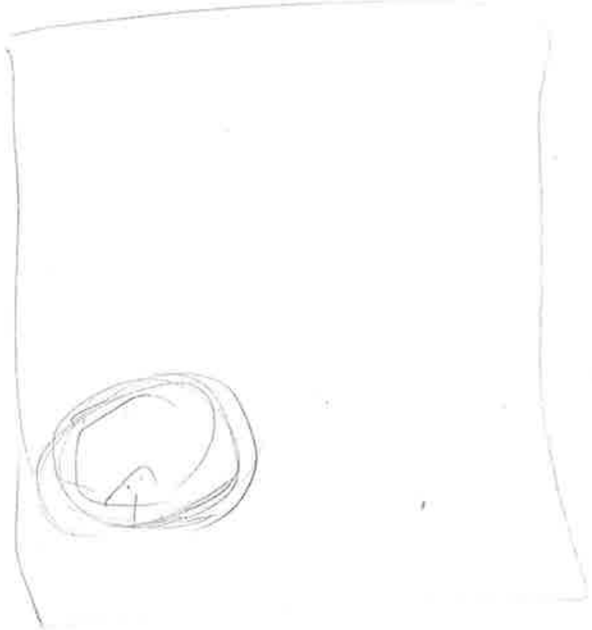
API can provide in this case a communication between tablet and PC using instructions and information. The instructions might change the information or return results.

Tablet controls communication between itself and the PC, where gene lives

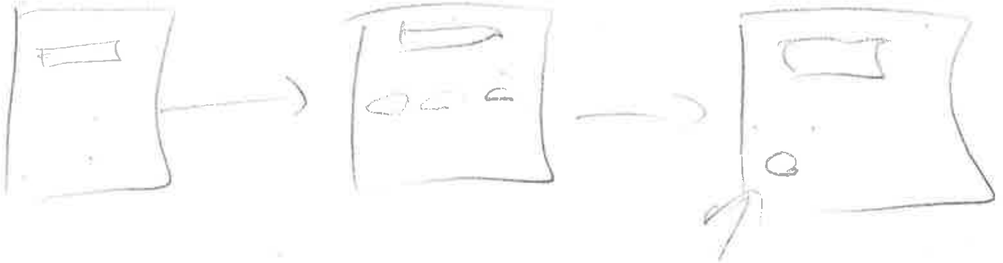
Restful API , MQTT API

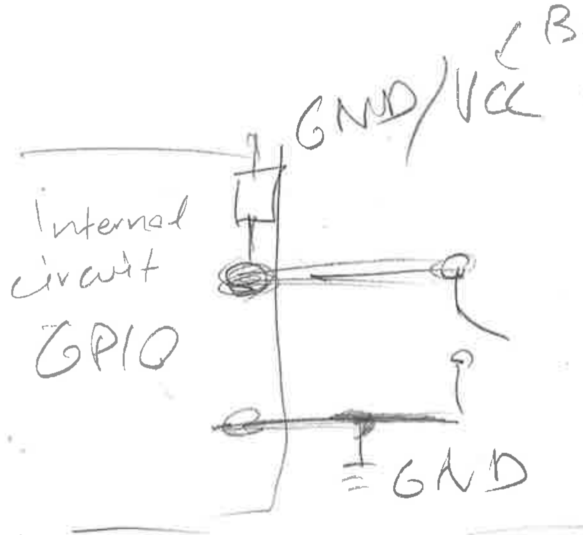
API { instruction (information) }

result

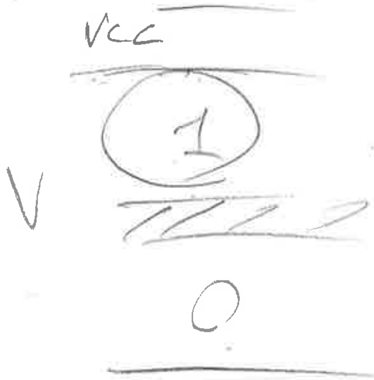


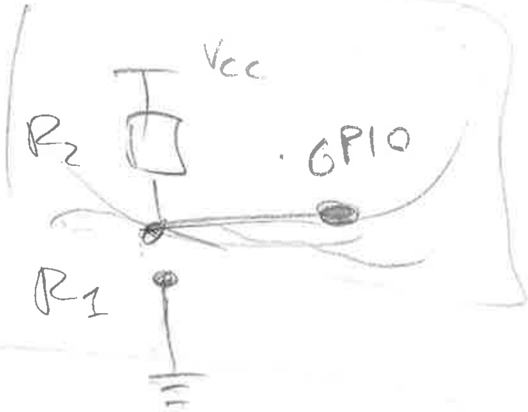
API upon touch




Battery
GND/VCC
Internal circuit
GPIO
GND

	R	V
Pressed	0	
Un-Pressed	∞	1




Vcc
R2
GPIO
R1

$V = \frac{R_1}{R_2 + R_1} V_{cc}$

$V \approx V_{cc}$

$R_1 >> R_2$ Unpressed

$\infty >> 4.7K\Omega$

$R_1 << R_2$

$V = 0$