



PRESENTATION

CHRISTIAN BEAUBIEN
STEPHANE ROUSSEAU

MANU MAKKER

MOHAMMAD RAZI

CONSTANTINOS PAPACONSTANTINOU



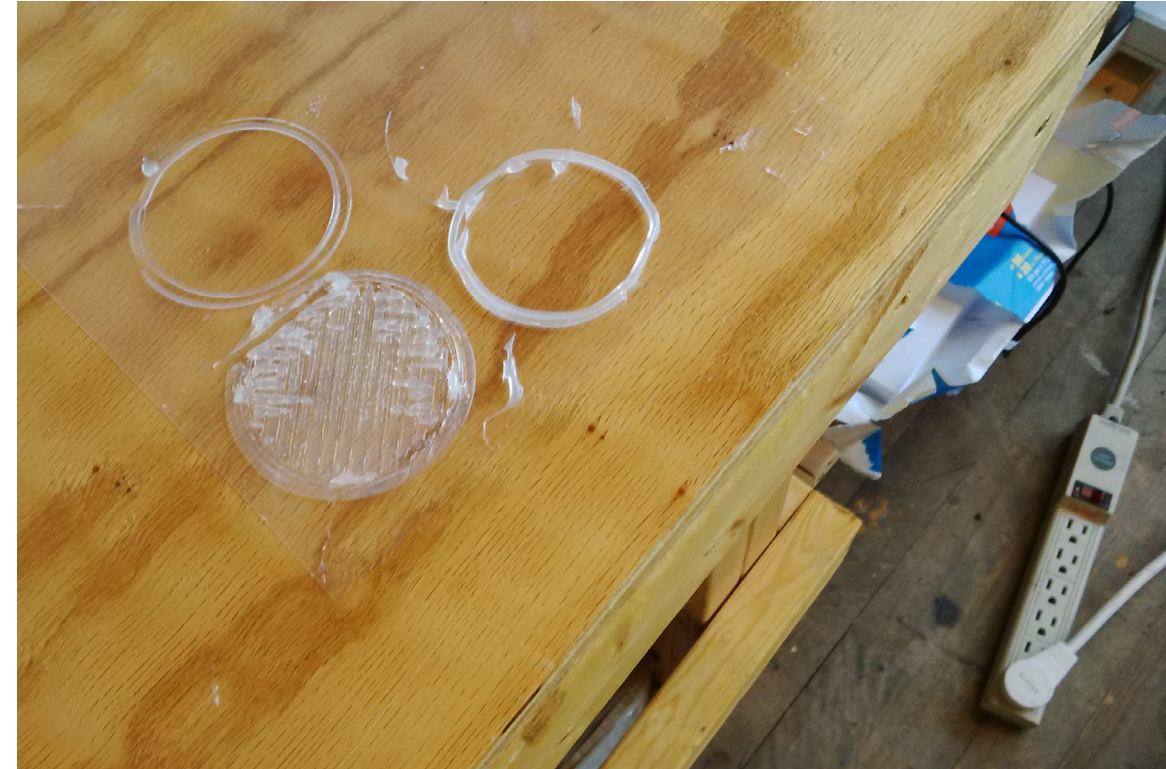
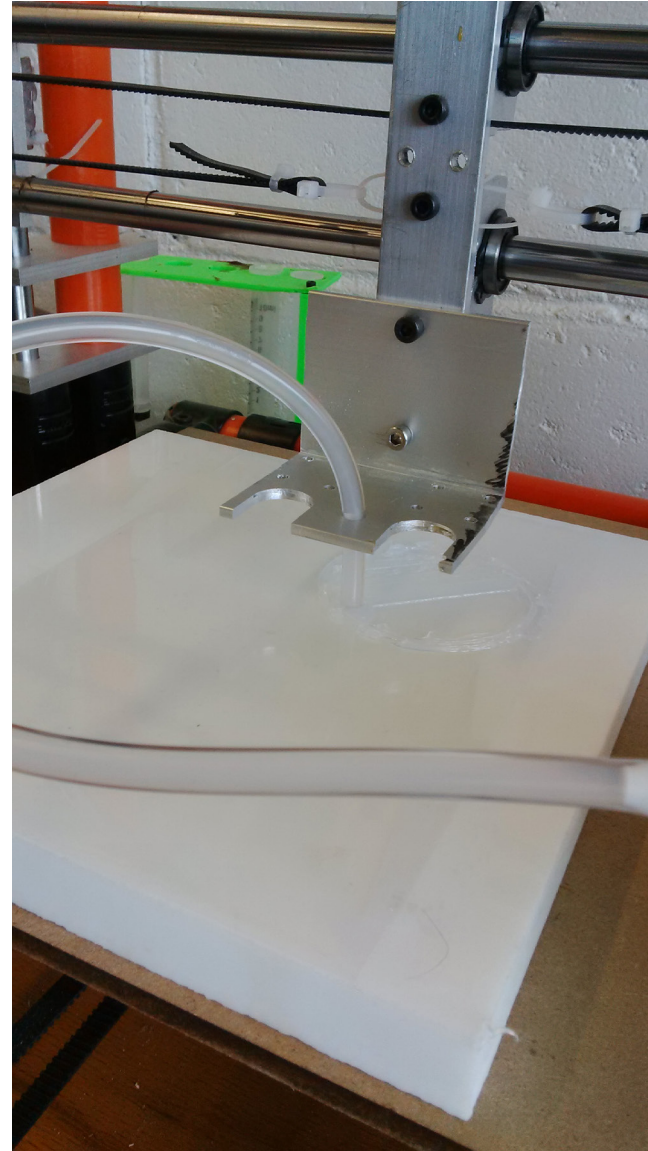
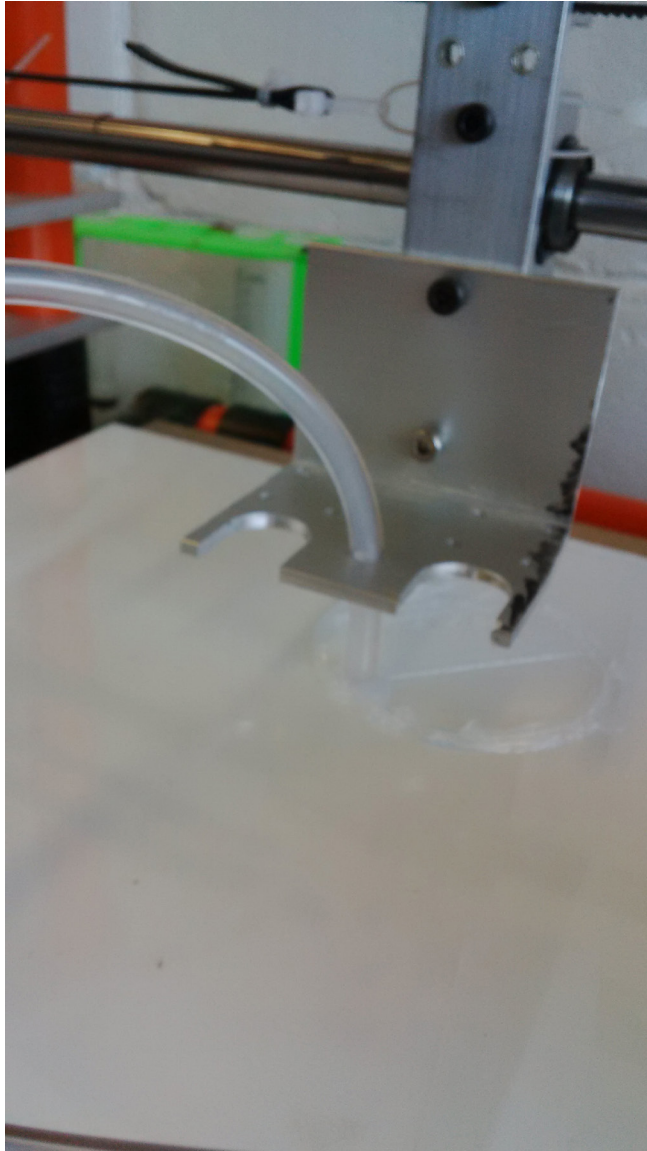
Project description:

Project outlines a silicone printer extruder. The concept is to further develop the 3d silicone printer. The timing of the silicone needs to be adjusted and the silicone it self needs to be tested. The testing will include all the available current machinery and tools for developing the design.

Project goal: To develop an extruder for consumer use.

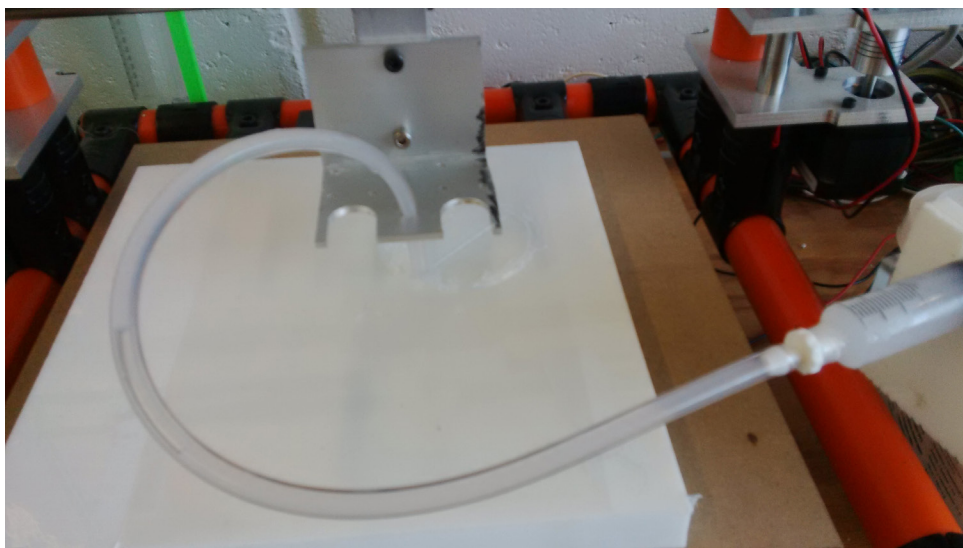


Testing on Day 1:



Day 1
Constantinos Papaconstantinou
The original nozzle was removed:

This specifically tested silicone with a drying temperature of 20 min. The extruder's nozzle was removed, and the tube of 3mm acted as the nozzle seen on the images to your left. The end of this tube was used to preform the print.



Machine and program details:

D=3
EM= 1

Silicone
drying time = 20 min



Day 1

Constantinos Papaconstantinou

Adjustments to speed and extrusion were made:

Conclusion was that $D=3$ and $EM=1$ gave us the best results. Variations around these numbers seemed to fail, but the machine had a lot of stress to overcome during all the related procedures. As you can see to your left the bottom image shows an almost perfect silicone circle. Unfortunately the extrusion needed to be canceled because of the amount of stress on the extrusion device.

Machine and program details:

$D=3$

$EM=1$

Silicone

drying time = 20 min

Day 1

Constantinos Papaconstantinou

Extrusion device:

This specific modular attachment to the 3d printer requires to be slightly modified to allow a smooth and continuous flow of silicone on to the printing surface. Further testing needs to be preformed in order to calculate the adjustments needed.

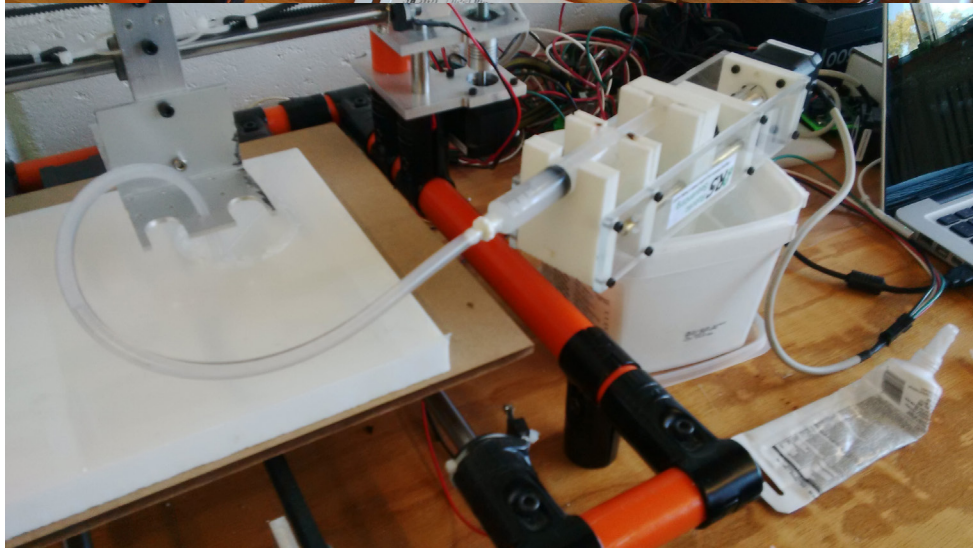
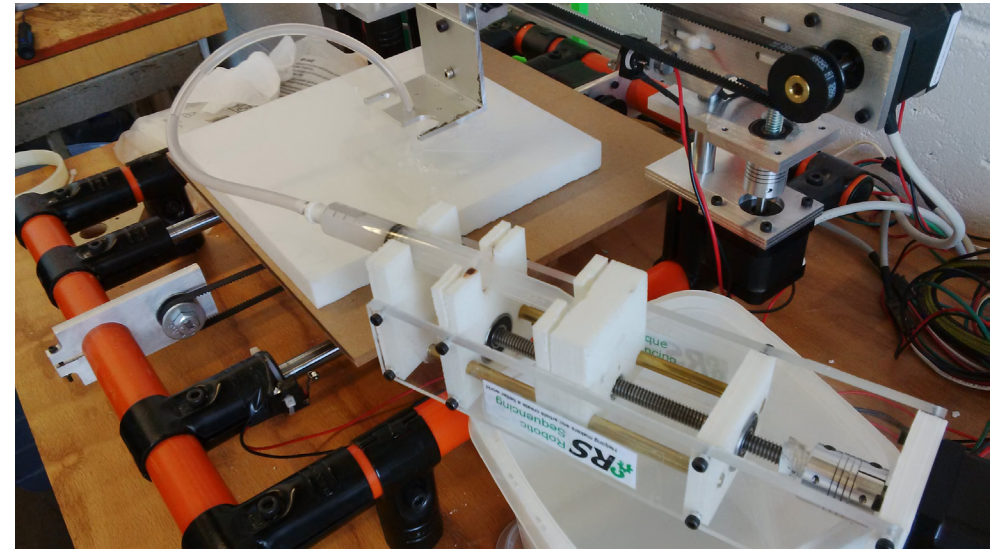
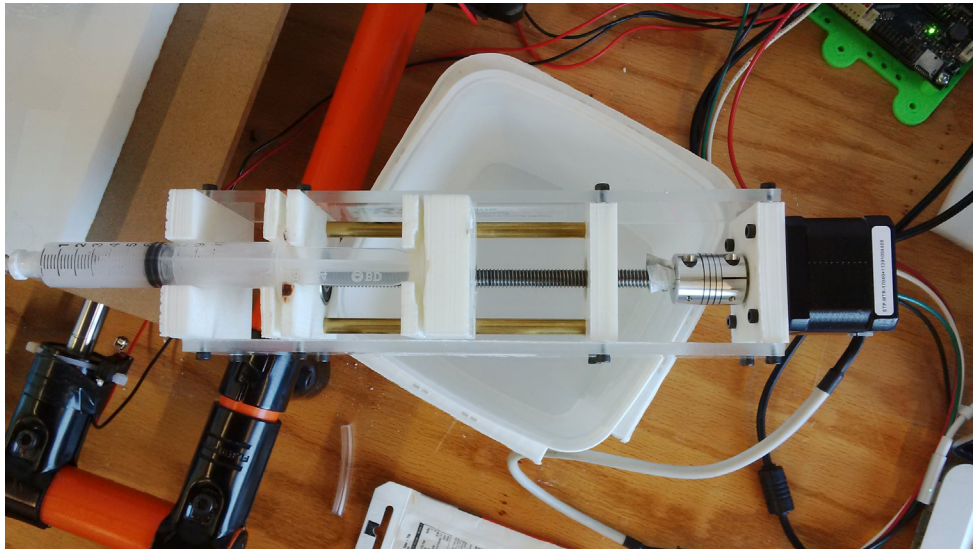
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D=3

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Silicone

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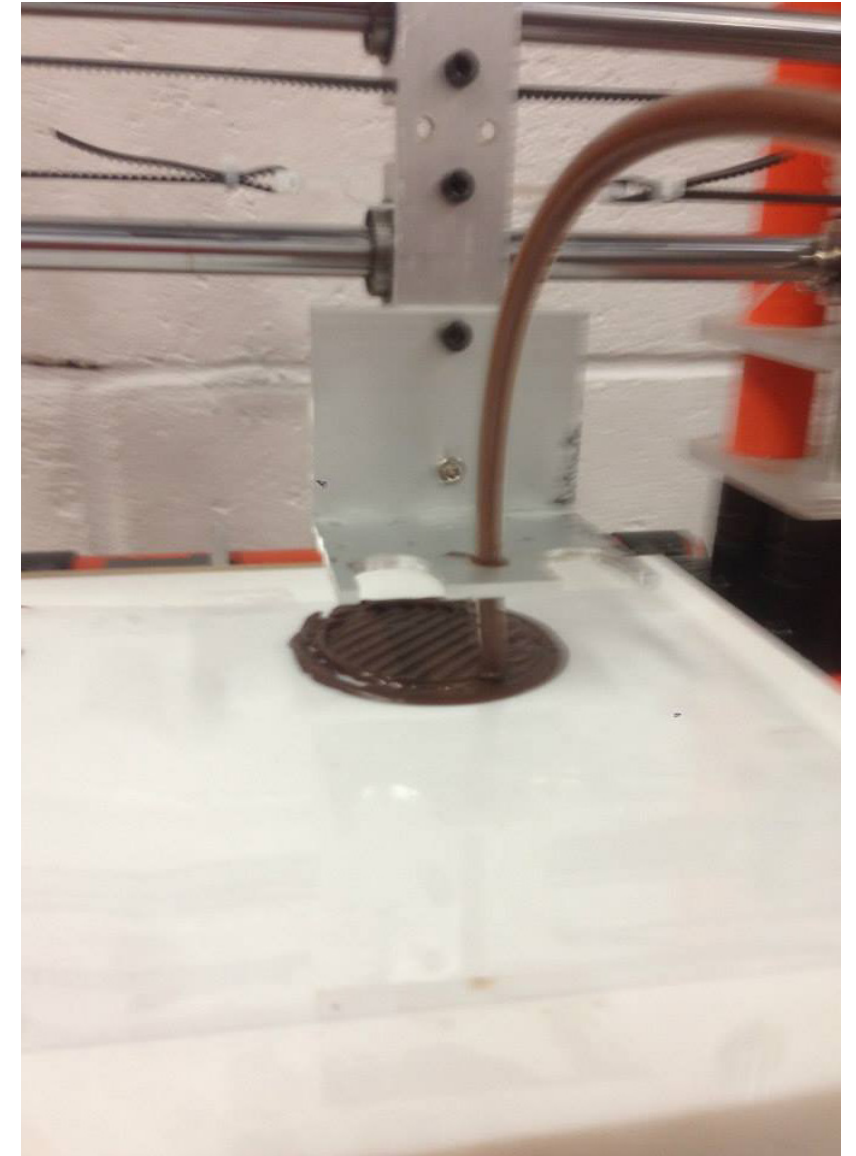


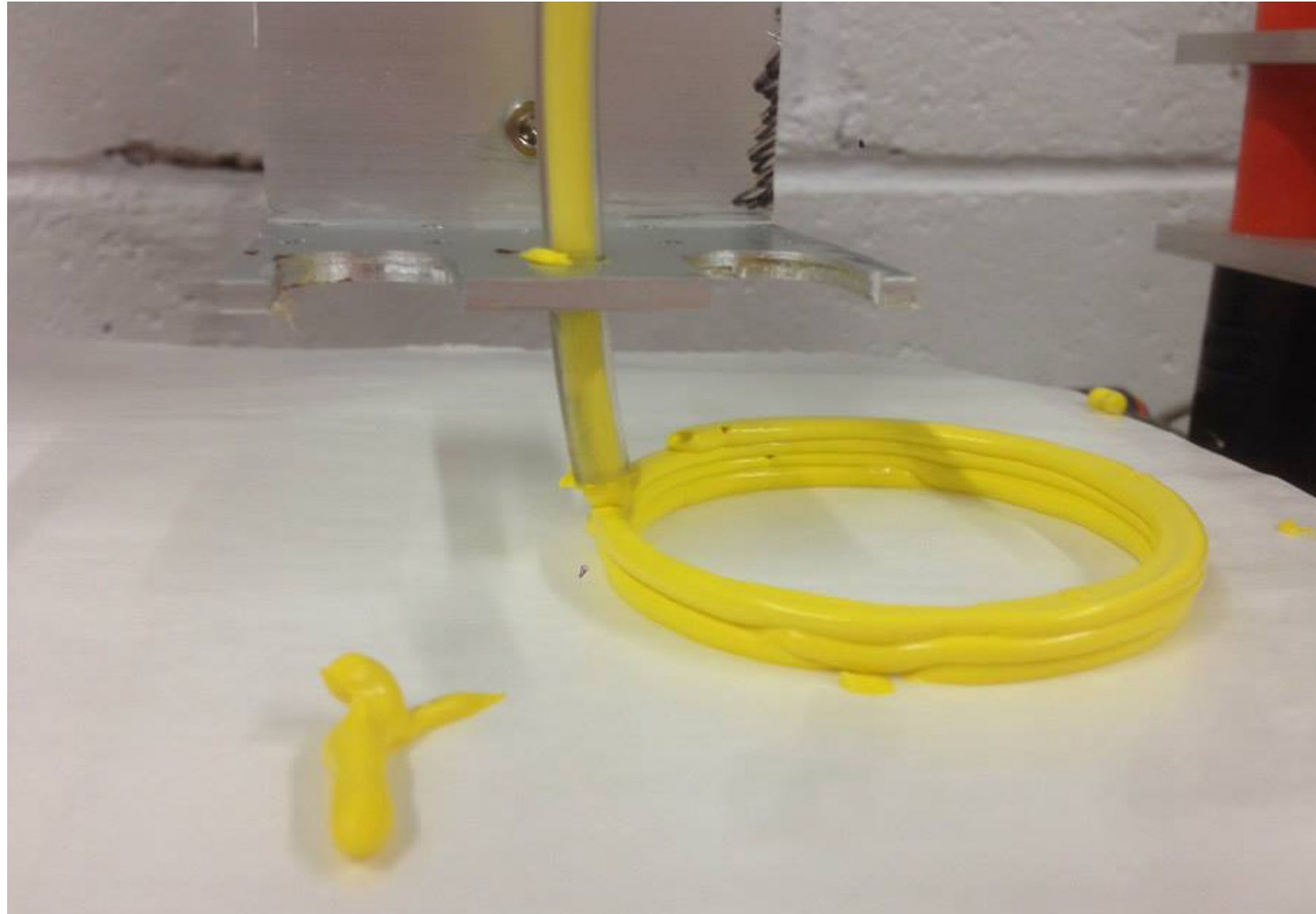
11-10-2014

Christian Beaubien

Notes:

- > Méthodologie pour la préparation du chocolat en seringue
- >
- > -Granuler la pièce de chocolat en petits morceaux puis l'introduire
- > dans la seringue
- > -Chauffer la seringue avec le micro-onde en séquence de 10 sec jusqu'à
- > ce que le chocolat passe en phase liquide.
- >
- > Test 1 Faire un cercle à plusieurs couches pour donner une forme 3D
- >
- > Correction et test
- >
- > Nous avons jointé le tube à la seringue sans adaptateur et embout final
- > Nous avons fait des tests avec les deux matières (chocolat et silicone)
- >
- > Résultats
- >
- > - Le chocolat sans les restrictions de l'adaptateur et l'embout final
- > fonctionne très bien
- > -Vitesse d'écoulement accrue
- > -Formation de couches supérieures avec ce système modifié pour le chocolat
- >
- > -Le silicone nous donne du fil à retorde et les résultats avec le
- > nouveau système n'est pas convainquant
- > -Problématique rencontrée : manque de matière, écoulement fracturé,
- > formes imprimées peu reconnaissables





15-10-2014

Christian Beaubien

Objectif:

Imprimer avec pâte à modeler pour artiste.

Nous avons utilisé la modeling paste flexible avec une couleur jaune acrylique.

Résultats :

-le premier essai confirme que la matière est extrudable car nous

avons atteint 3 couches de haut;

-le deuxième essai donne de piètres résultats : bulles d'air, manque

de matière, extruder coincé, la matière ne coule pas bien;

-le remplissage de la seringue une fois utilisé ne fonctionne pas

comme prévu donc beaucoup de paramètres à vérifier.



3D Extruder Team:

CONSTANTINOS PAPACONSTANTINOU
Field of interest: Industrial Design and Marketing. Intergrated technologies and design art preactices.

www.linkedin.com/in/cpapaconstantinou

MANU MAKKER
Fields of interest: Marketing & Strategy, Product and Process Innovation, Human Centered Design.

www.manumakker.com

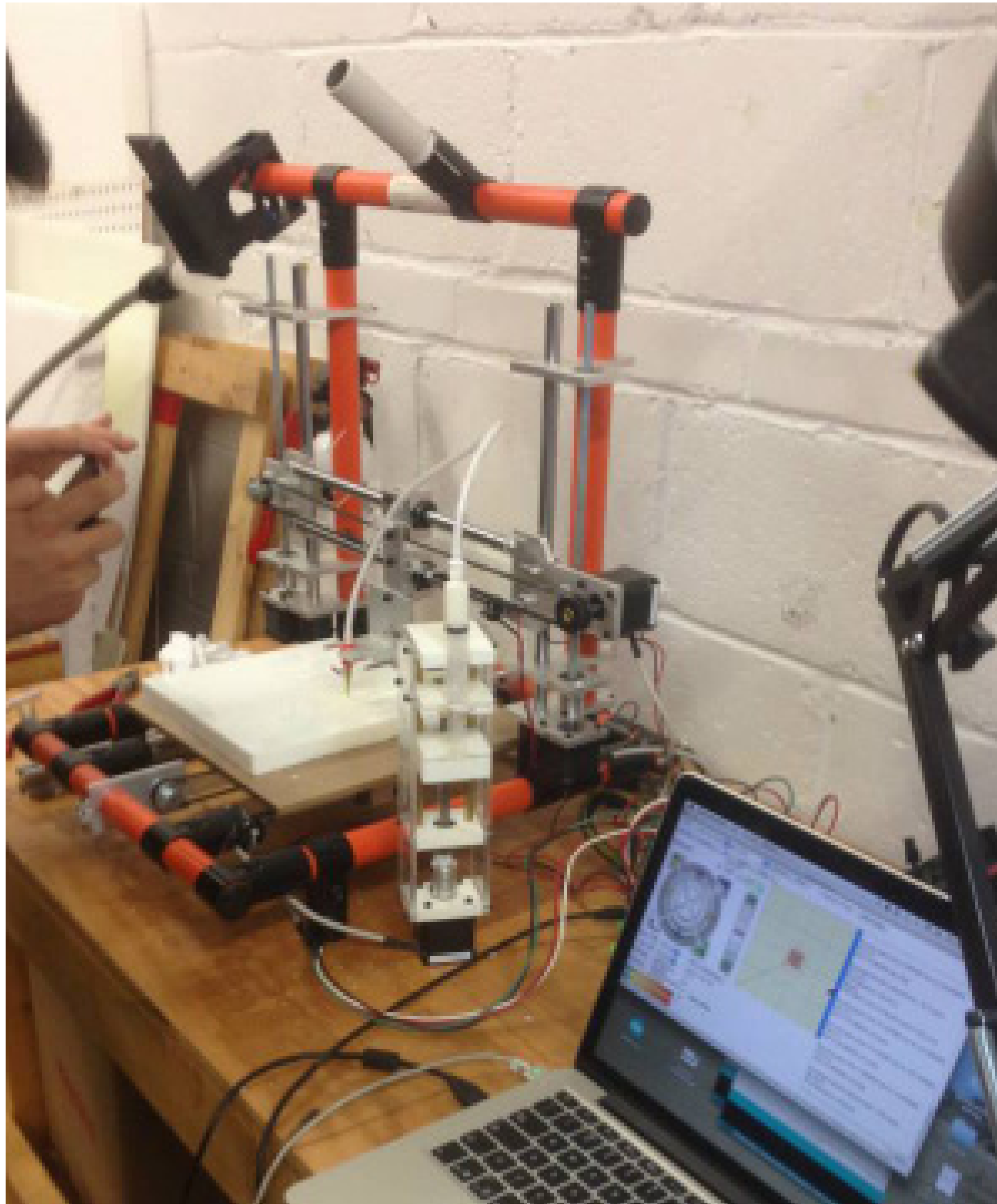
MOHAMMAD RAZI
Fields of interest: Mechanical Engineering Vibrations and Rotordynamics.

E-mail: mrazi@alumni.concordia.ca

JESSY DAVID MARIE YAMEOGO
Fields of interest: Software development and system design.

<http://ca.linkedin.com/in/jyameo>





15-10-2014

Constantinos Papaconstantinou:

There are some figures we need to fix on the 3d device. I high calibration needs to be made for the second, third and fourth layers of the device. Upon lift, for the second layer the device axis does not lift high enough. It drags through the original layer below.

Please let me know if you guys have any ideas on how to fix this problem.

Jessy D.

Yameogo I started doing some research to familiarize myself with 3d printing. I wanted to try this calibration test that I found online, maybe this can be a start...
<https://www.youtube.com/watch?v=JZGdMc2ebPo>

Extruder Calibration

Don't update the firmware to change the steps. Instead you can enter the gcode command M92 E(number of steps)...

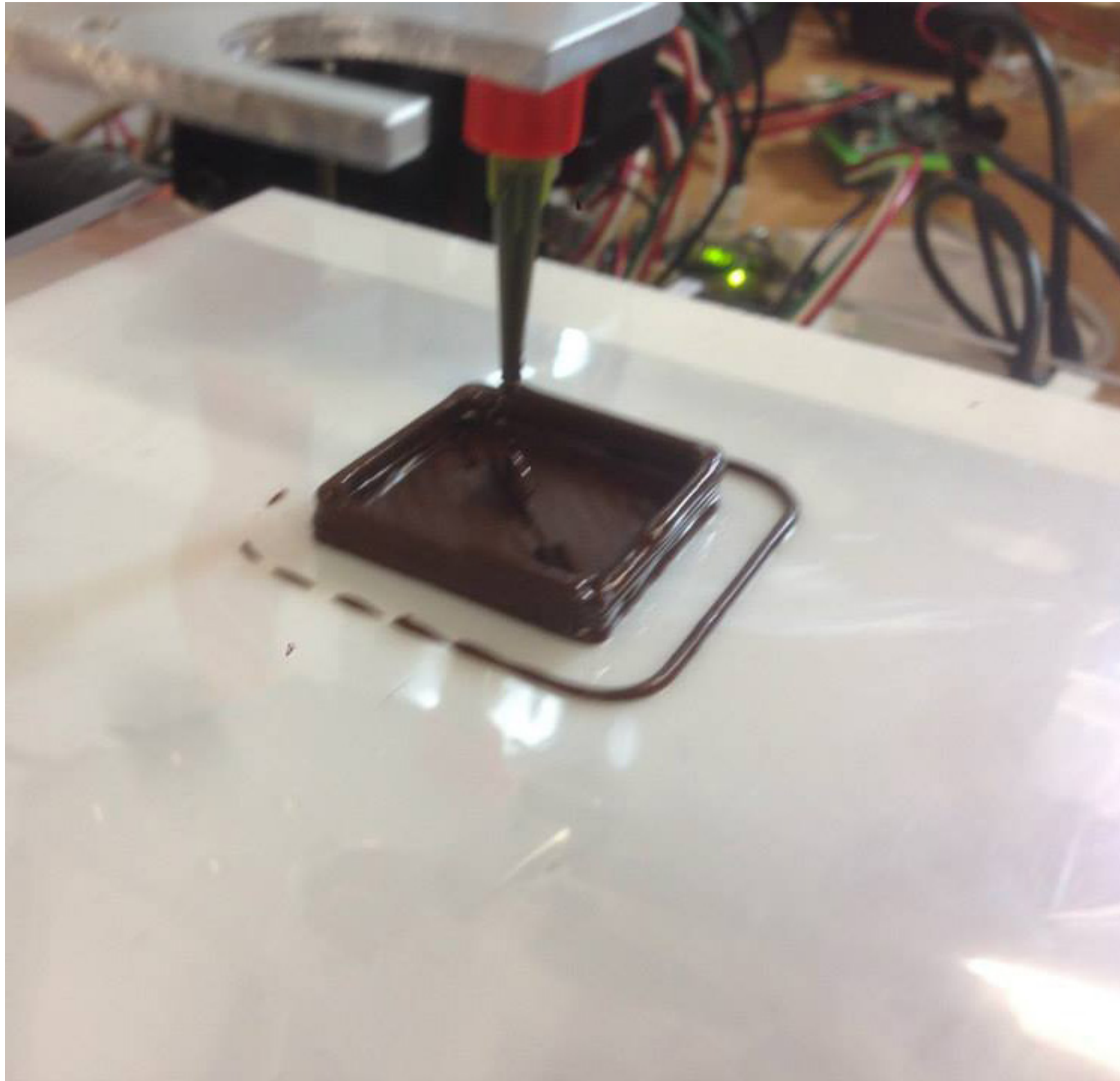
YOUTUBE.COM

Yesterday at 1:42pm · Edited · Like

Dino:

Nice! Well in this case we are using liquid. For the liquid to get through with no resistance we are using the tube as a final diameter of approximately 2mm diameter. 2mm diameter tubed liquid extrudes, all is good second layer the machine only rises 1.9mm - 3mm approximately. It should elevate to about 3.5mm or 4mm.





Constantinos Papaconstantinou:
Chocolate extrudes well when
heated.



Constantinos Papaconstantinou:
Peanut butter extrudes incredibly
well.

Mardi le 07-10-2014
Christian Beaubien

Objectif:
Faire une forme simple avec l'extruder
10ml puis projeter les résultats vers
l'extruder 60ml.
Étapes:

-Défaire la tête extrudeuse de filament de
plastique (pla) de la rebrap du labo ADI

-Installer la tête épingle sur la base de
soutien en aluminium de la rebrap

-Fixer le tube à l'extruder 10ml de
Robotic Sequencing puis à la tête
d'épingle

-Préparer une solution pâteuse pour
créer une forme simple en 3D avec le
nouveau mécanisme

Problèmes rencontrés:
-Résistance dans le tube et dans
l'embout

-Vis hexagonale qui s'est défaire du
mécanisme original de l'extruder 10ml

-Force du moteur pour les futurs tests,
est-il assez puissant?

-Densité de la solution pâteuse ?

Photos:
-Plusieurs photos ont été prises
Suivi:

-Discussions et solutions à venir

je pense que chaque tube vs l'embout
(avec toujours le même moteur et spec
de force) acceptera ou n'acceptera pas
tel ou tel matériaux (solution pâteuse).

Peut-être commencer dans un ordre
croissant de "densité" de plus mou
(fluide) à plus dur et de MESURER la/les
limites.

Je connais l'instrument de mesure pour
la rhéologie: viscosimètre, mais pas pour
la dureté d'une pâte, je vais faire des
recherches.

Mardi 14-10-2014
Christian Beaubien

Objectif:
Présentation du flux de travail du labo
extruder 60ml

-Expérimenter la matière chocolat pour
bâtir des formes complexes telles que
pyramide et carré à étages multiples

-Projection pour futur matière silicone et
autres matières pâteuses

Présentation:
-Introduction aux logiciels utilisés au
labo ADI pour le bon fonctionnement de
l'échorap

-Q/R sur la présentation
Expérimentation:

-Utilisation des fichiers STL des croquis
proposés

-Test avec le chocolat

-Retour sur les résultats

Problèmes rencontrés:

-Comportement du chocolat dans le tube

-Température qui fait des siennes

-Pression dans le tube et les embouts

-Refroidissement de la matière après 20
min

-Proposition de changer la grosseur des
embouts ou du tube

-Filament chauffant sur l'embout

-Pompe à eau pour avoir une pression
régulière et plus puissante

-Moteur de l'échorap a sauté quelques
pas?

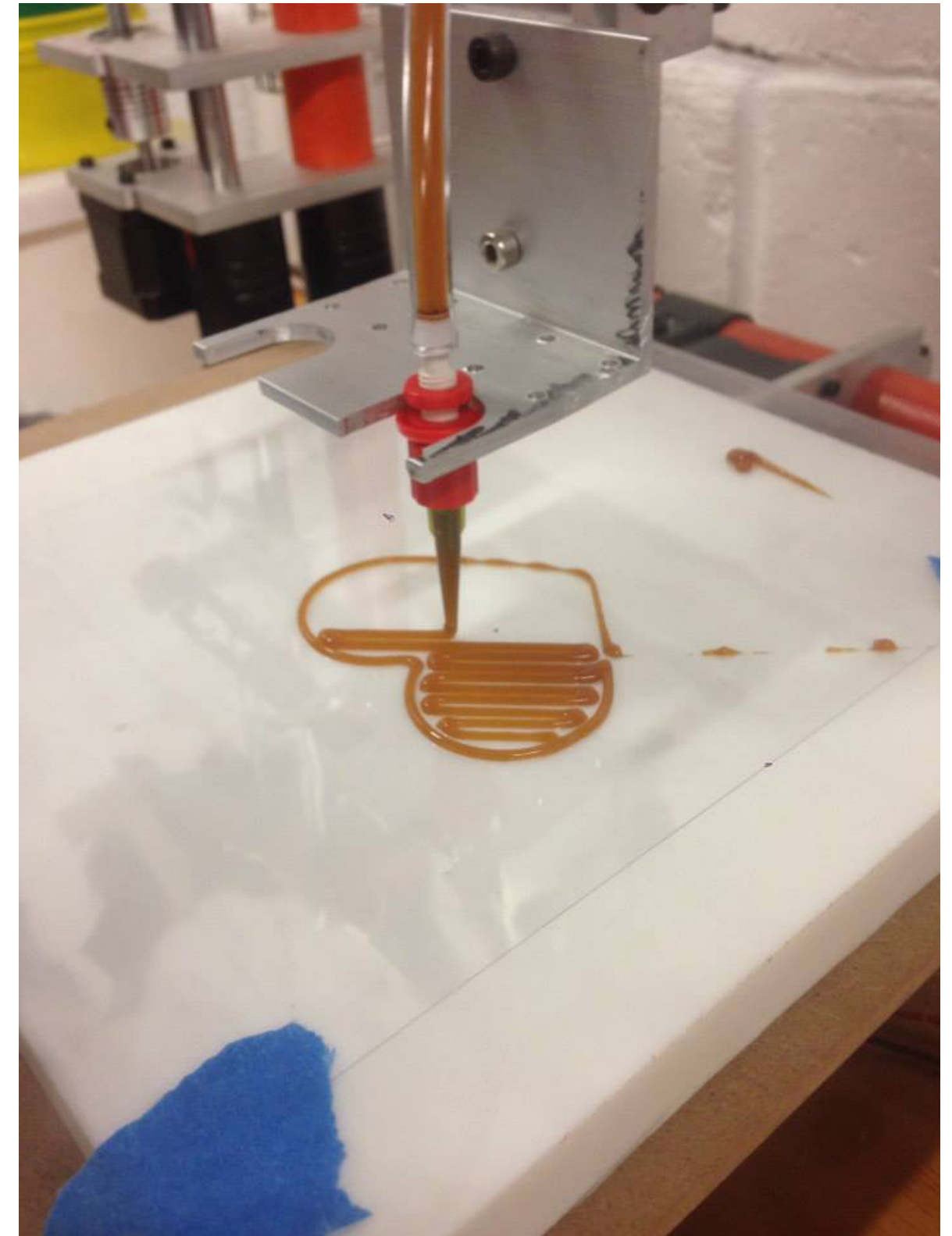
Discussions et solutions:

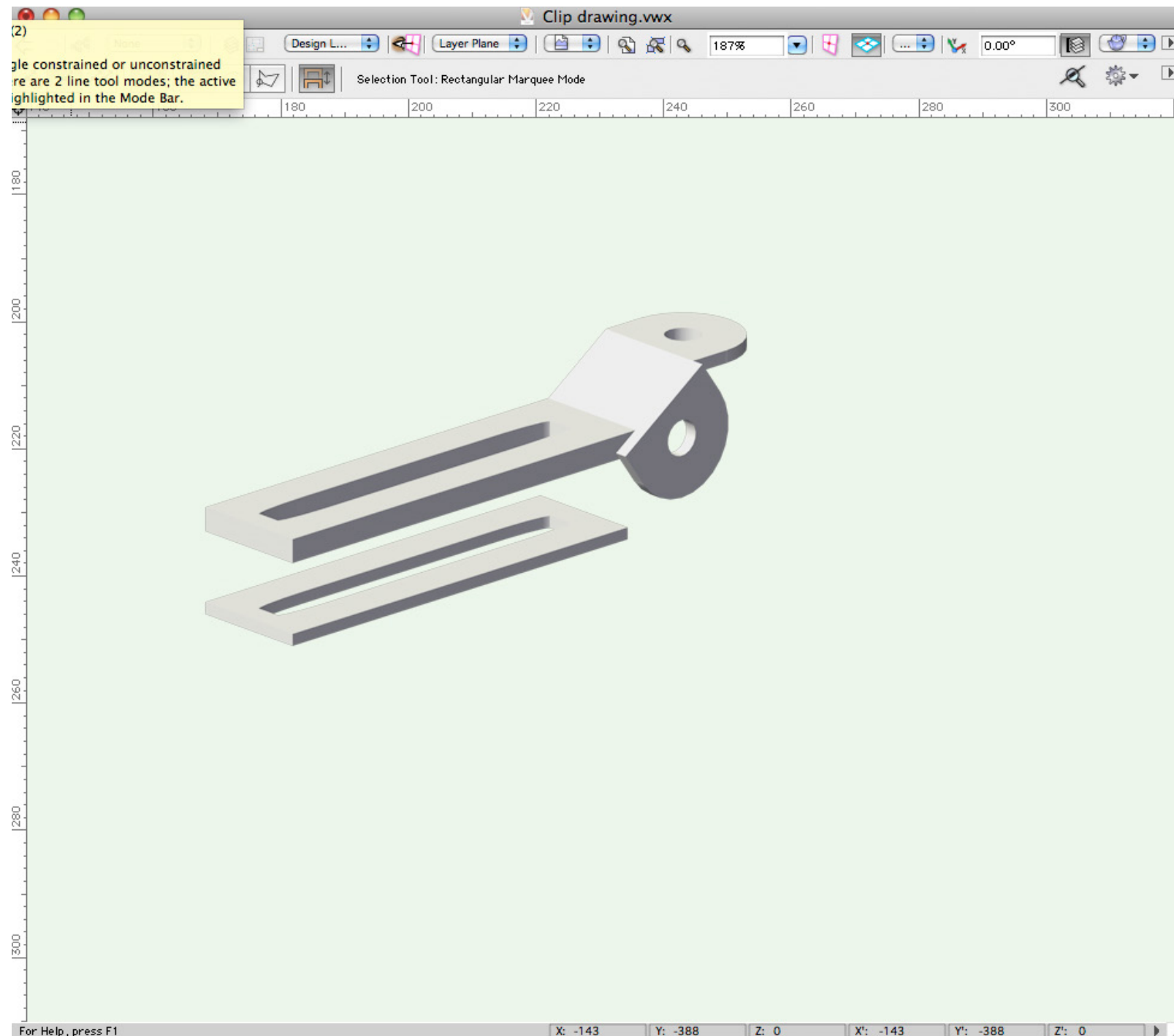
Juste pour vous rappeler d'essayer
d'avoir plusieurs (en boîte si possible)
tuyaux (et têtes d'embouts) afin de ne
pas interrompre les tests au besoin,
enchainer différentes matières les unes
derrières les autres etc..

De mon côté je regarde pour avoir
des feuilles d'acétate aux dimensions
du support carré (et trouver une/des
astuces pour pouvoir le stabiliser/coller
et décoller à souhait.. J'apporterai
aussi des feuilles quadrillés que l'on
placera dessous, et pouvoir disposer de
mesures..).

Aussi les graines d'avoine, il serait alors
bien d'avoir à disposition le micro-onde,
de plus je pourrai commencer la démo
de la seringue remplie de chocolat "prête
à l'emploi".

Je vais acheter un ou deux
thermomètres voir 3 (1 température
pièce, 1 température du chocolat et une
sonde contrôle température des graines
d'avoine..)





The product will only include the following.

- Cartridge of liquid or liquids. (food, or chemical.)
- Cartridge compresseur,
- Tubes

The 3d X Y table will not be included as part of the product selling to the public.

Nozzle check specs:

The machine needs to be able to work with several materials at a time.

This can include any combination:

- liquid materials,
- and or plastic materials.
- The nozzle must have the capability to mount several 3d prototyping devices.



21-10-2014
Christian Beaubien

Objectif :
Créer des bibliothèques informatiques :

-une thématique matière alimentaire (chocolat) Noël-un utilitaire pour la matière silicone

Quelques idées :
Sépare fil pour device électronique
-sous plats. Coins de table ou autre
-moules alimentaires Orthèses -semelles antidérapantes Tétines pour plaque de verre
-sépare-orteils

Problèmes et solutions :
Changer les vis de l'extrudeur de 24 traits 5/16"

Lubrifier les tiges de soutien
Problème de pression dans la sortie de l'embout donc, peut-être vérifier avec fournisseur autres grosseurs

Expérimentation avec une matière alimentaire caramélisée

Nous avons eu un succès avec une forme choisie un " cœur " puis le reproduire en caramel

Commentaires et discussions :

28-29-31 Oct 2014
Christian Beaubien

Objectif:
-Faire des test avec le silicone et le caramel
-Brainstormer sur des services et objets dans les deux matières exploratoires
-Optimiser la méthode de travail au labo

Observations:

-Le silicone est très difficile à extruder
-Le débit et la vitesse de sortie de la seringue
-Nous avons fait plusieurs tests avec des paramètres différents
-Les résultats sont pour l'instant limitatif

05-06-08 nov 2014

- Méthodologie pour la préparation du chocolat en seringue

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Résultats

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* fonctionne très bien
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manque de matière, écoulement fracturé, formes imprimées peu reconnaissables.

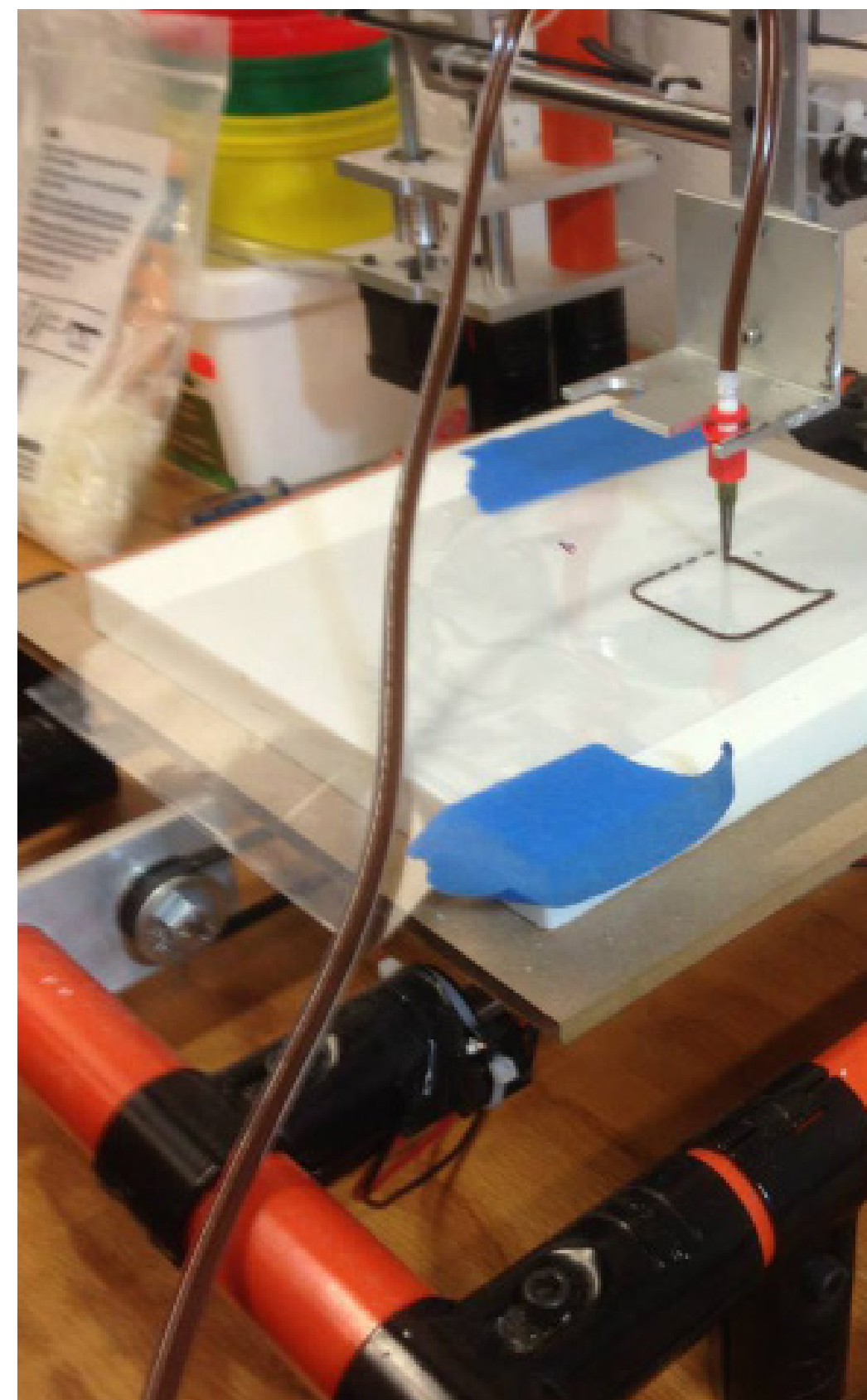
11-11-2014
Christian Beaubien

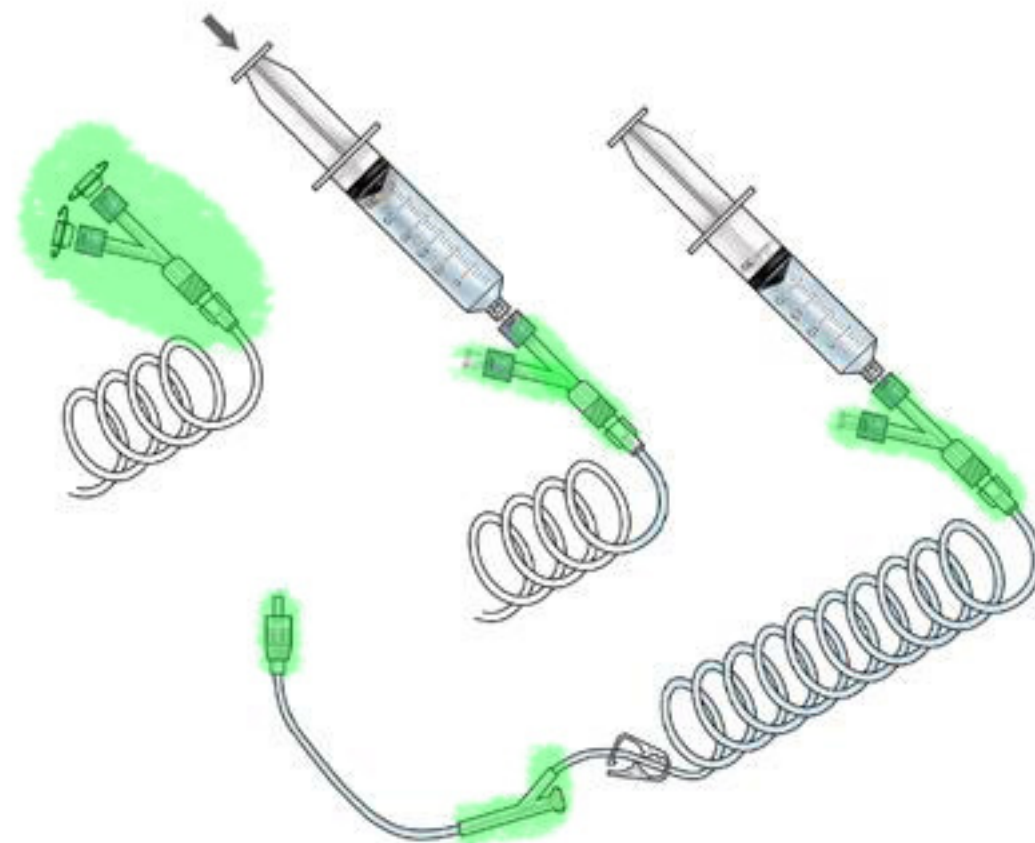
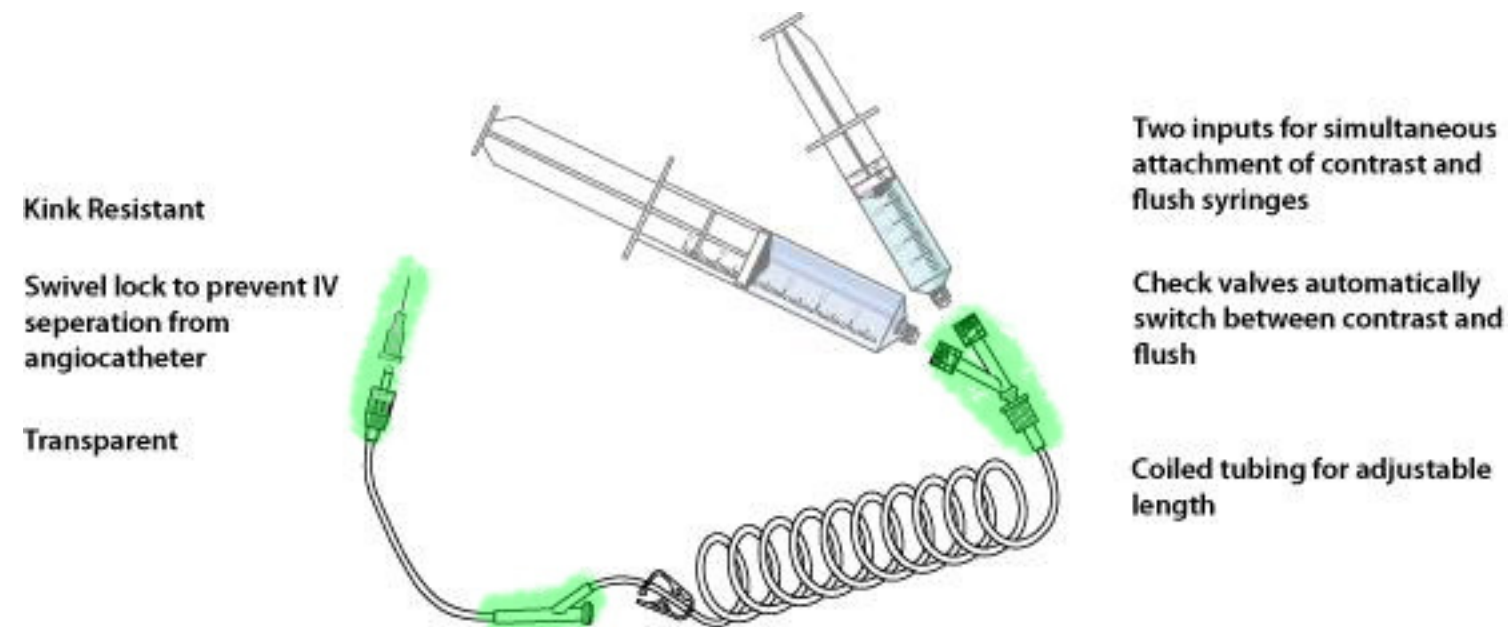
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bulles d'air,
manque de matière,
extruder coincé,
la matière ne coule pas bien;

- le remplissage de la seringue une fois utilisé ne fonctionne pas comme prévu donc beaucoup de paramètres à vérifier.





22-11-2014
Constantinos Papaconstantinou

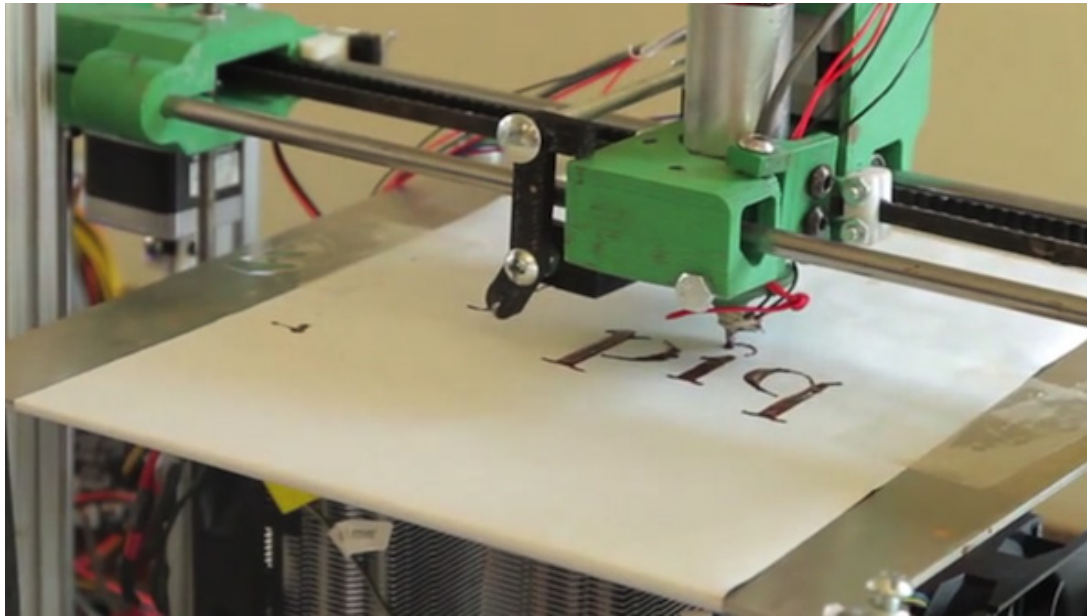
Various types of tube assemblies have been researched.

Based on testing combining tubes leads to more stress on the compressing machine and its engine. Removing parts such as the ones highlighted to the left, will lead to a smoother performance on the machine.

Problem:
Unfortunately this might also make the extrusion substance less detailed due to its large size and Radius.

If a substance is more liquid then the material will extrude at an easier rate, but the 3d extrusion will take more time.

Many silicone solutions will require two forms of material to help reduce the time for curing.



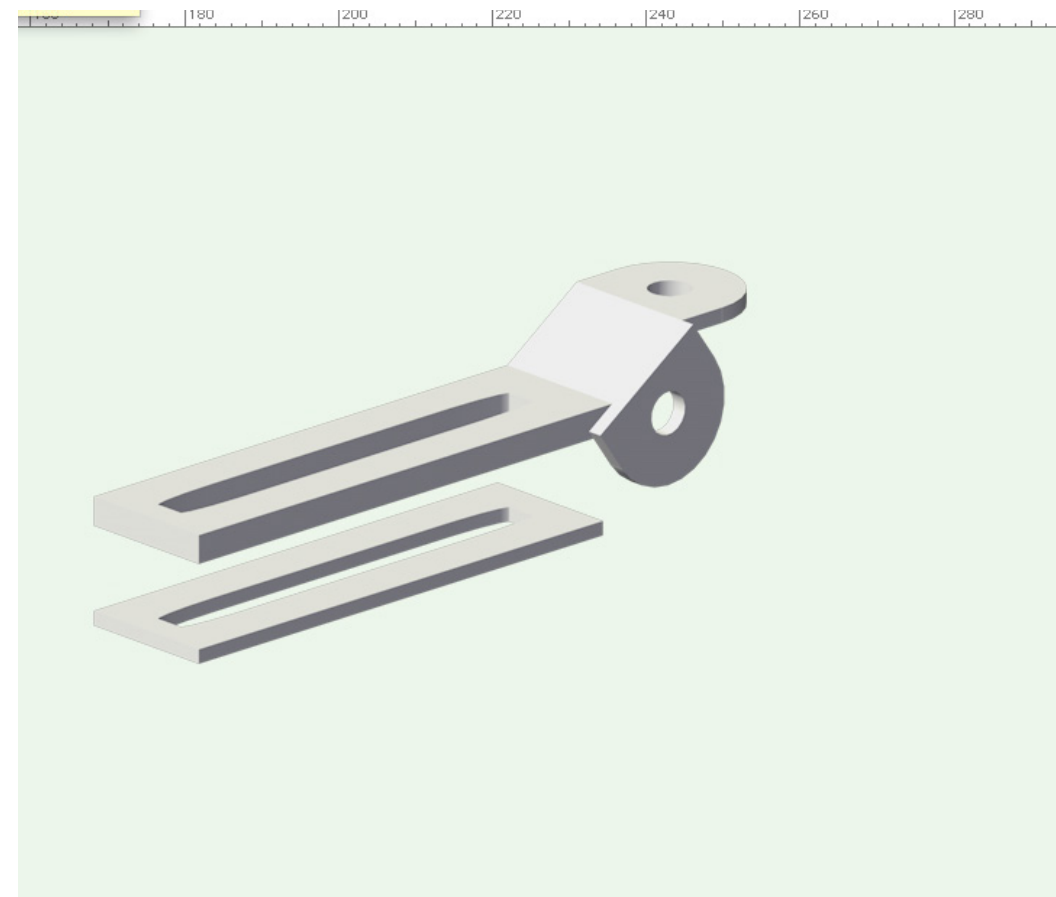
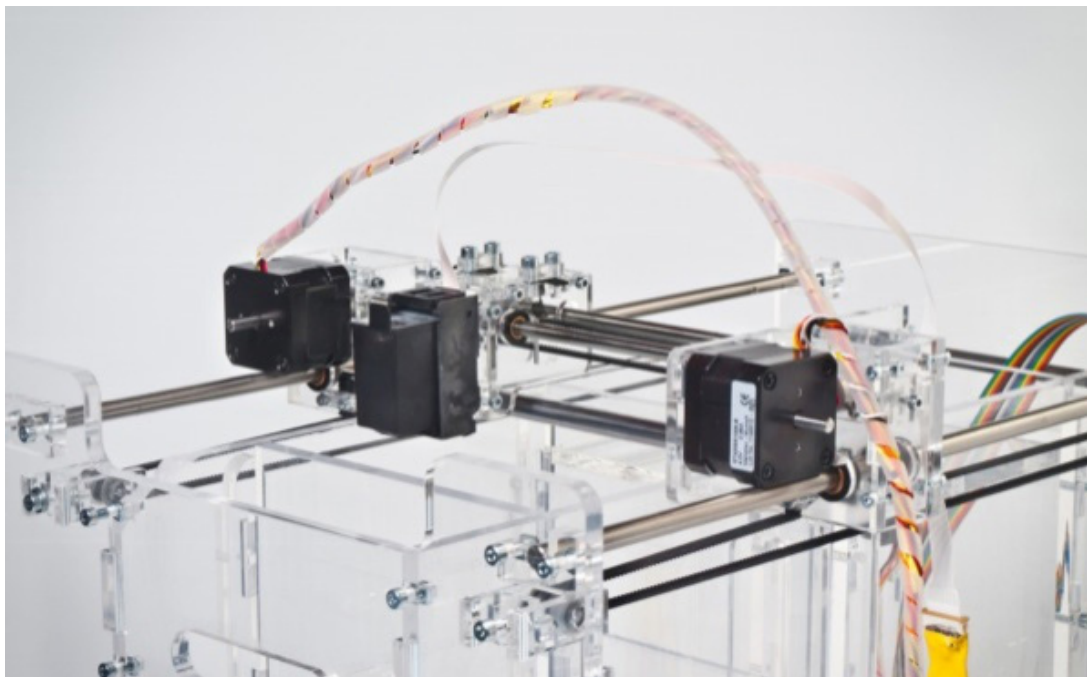
22-11-2014
Constantinos Papaconstantinou

Mounting the device on to a pre built 3D x y axis printer.
Most of the devices running for three dimensional printing have a X and Y horizontal bars to help calibrate adjust the cutting or extruding serfus of the machine.

You can see this on the images to your left.
In general this is how they function.

The development of the nozzle will help mount our tubes on to any ready built model. It must clamp , clip , or mount with precision and keep its 90 degree vertical alignment to properly extrude liquid.

Bellow you can see one of our first 3d model prototypes. This version was not printed.

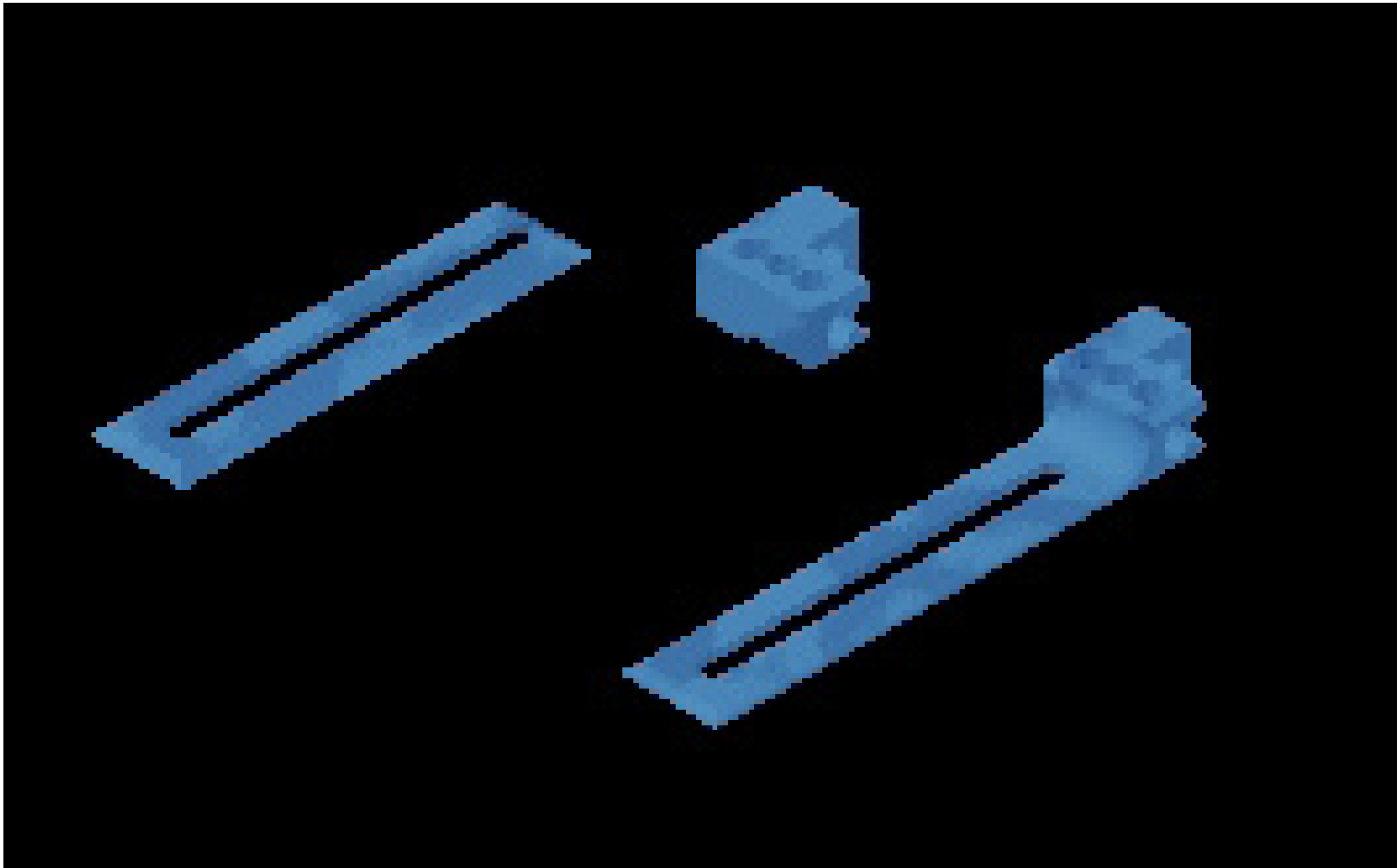


Mardi le 22-11-2014
Constantinos Papaconstantinou

This specific nozzle for the 3 Dimensional printer was designed to be mounted with two sets of bolts.

The slots are designed to move, and are adjustable to accommodate a vast variety of 3 dimensional printers.

This part is ment to be printed on an FDM plastic printer.



Branding Development

22-11-2014
Manu Maker

Name: **zedaxys solutions**

Thought behind:

- Allowing people to experiment with the 3rd axis
- There are the letters X, Y, and Z in the name

Website: www.zedaxys.com

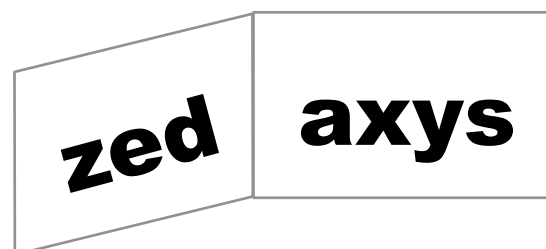


Option 2

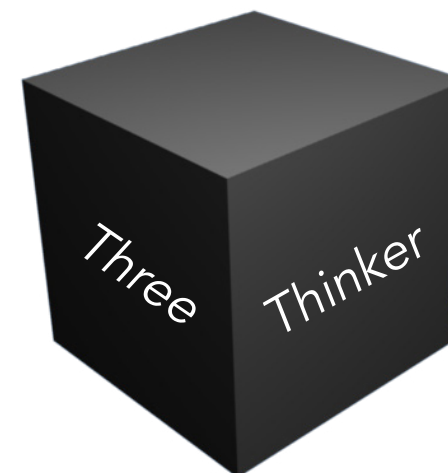
Name: **Three Thinker**

Thought behind:

- Comes from the term 'Free Thinker'
- Talks to free thinking makers



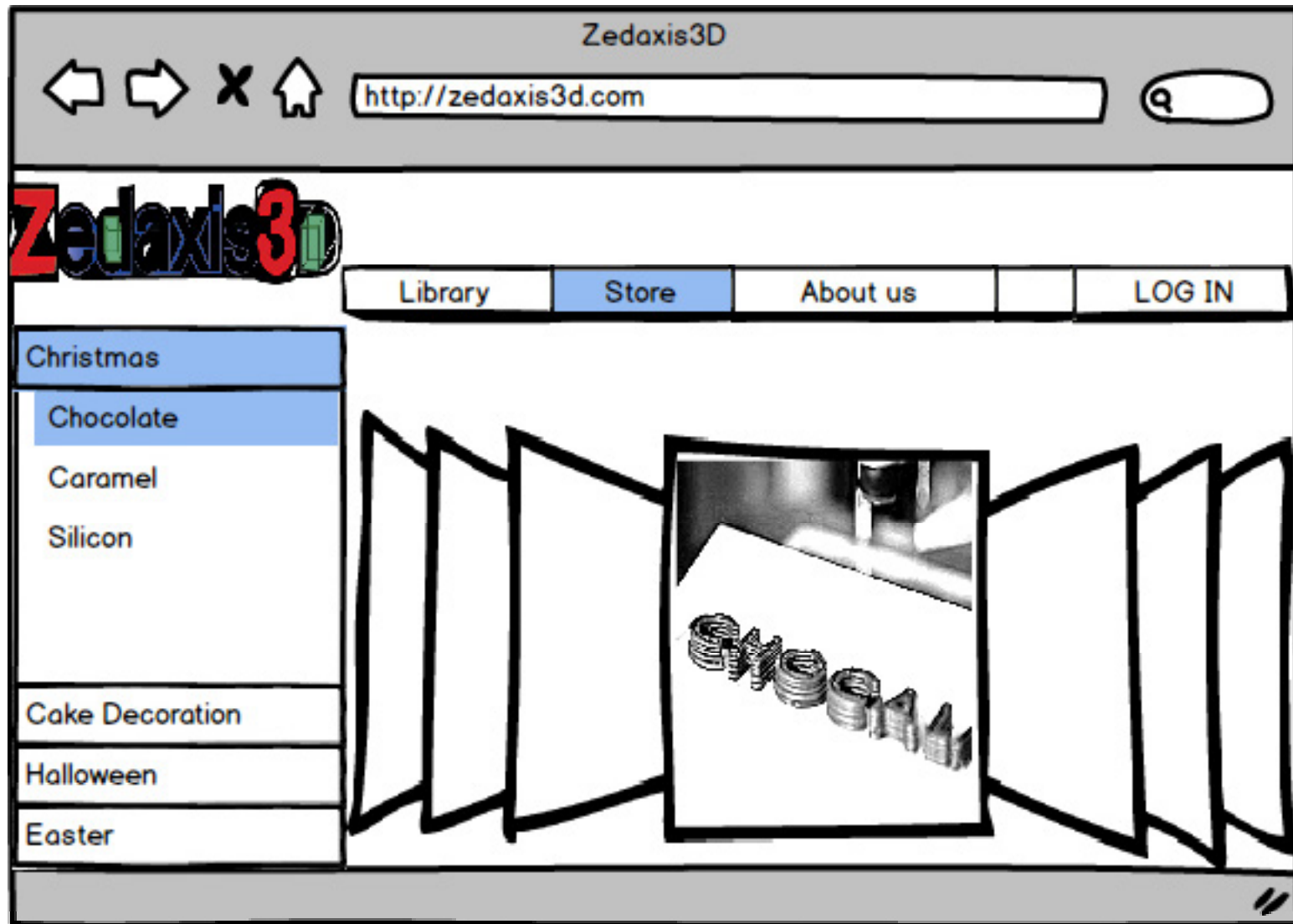
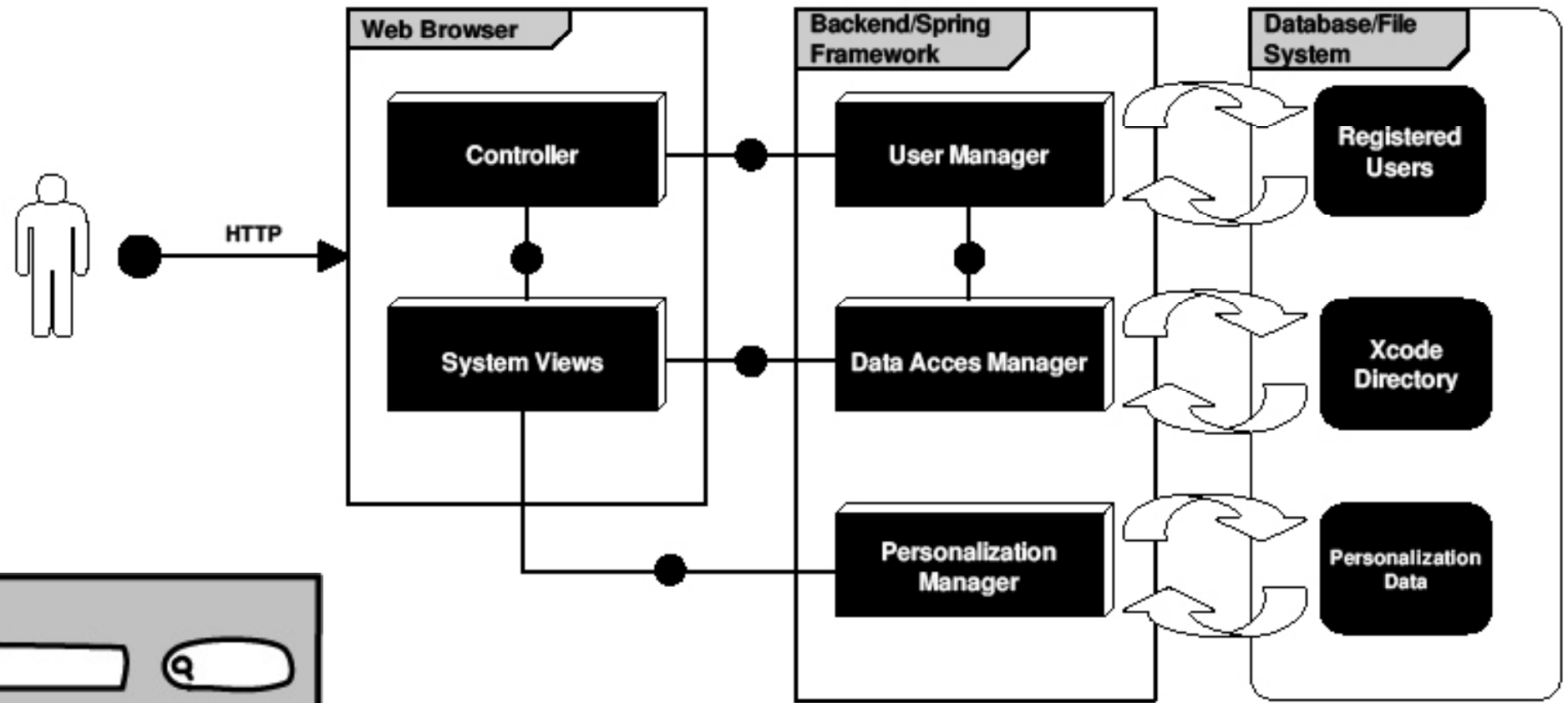
Logo:



Website: www.threethinker.com



Block Diagram - Sequence Diagram



BRANDING WORD BRAINSTORMING.

Zed
axys
Baking
Decor
Ornamentation
Recipiесе
Food
Desserts
Gateaux
Chocolate
Caramel
Fondue
cubed
3d

Materials:

silicone,
plastic,
wood,
plaster,



2 Target markets

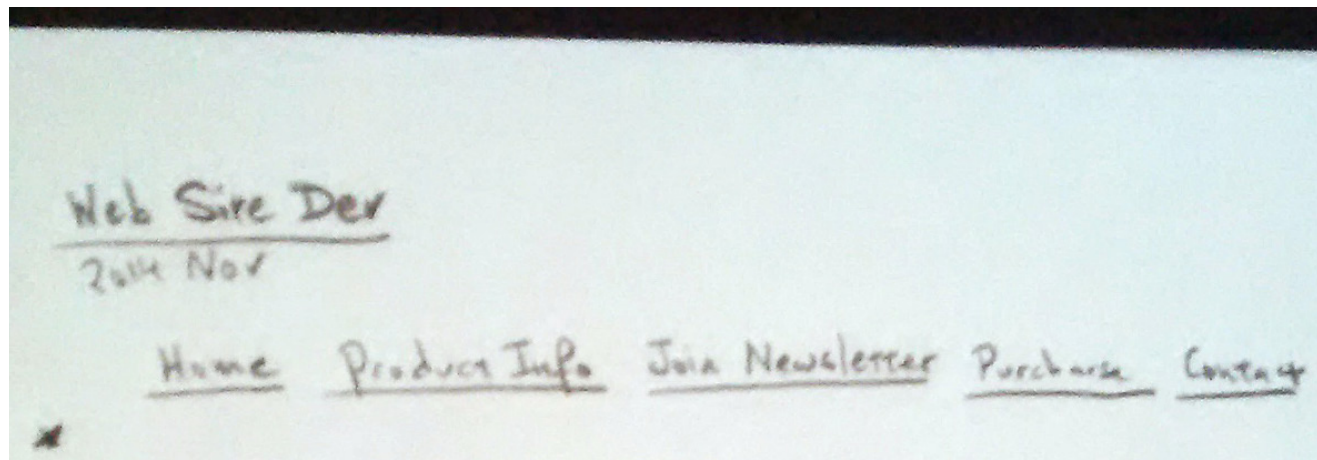
- * Food extruder
- * Material extruder
- * 3D Prototype downloads / uploads

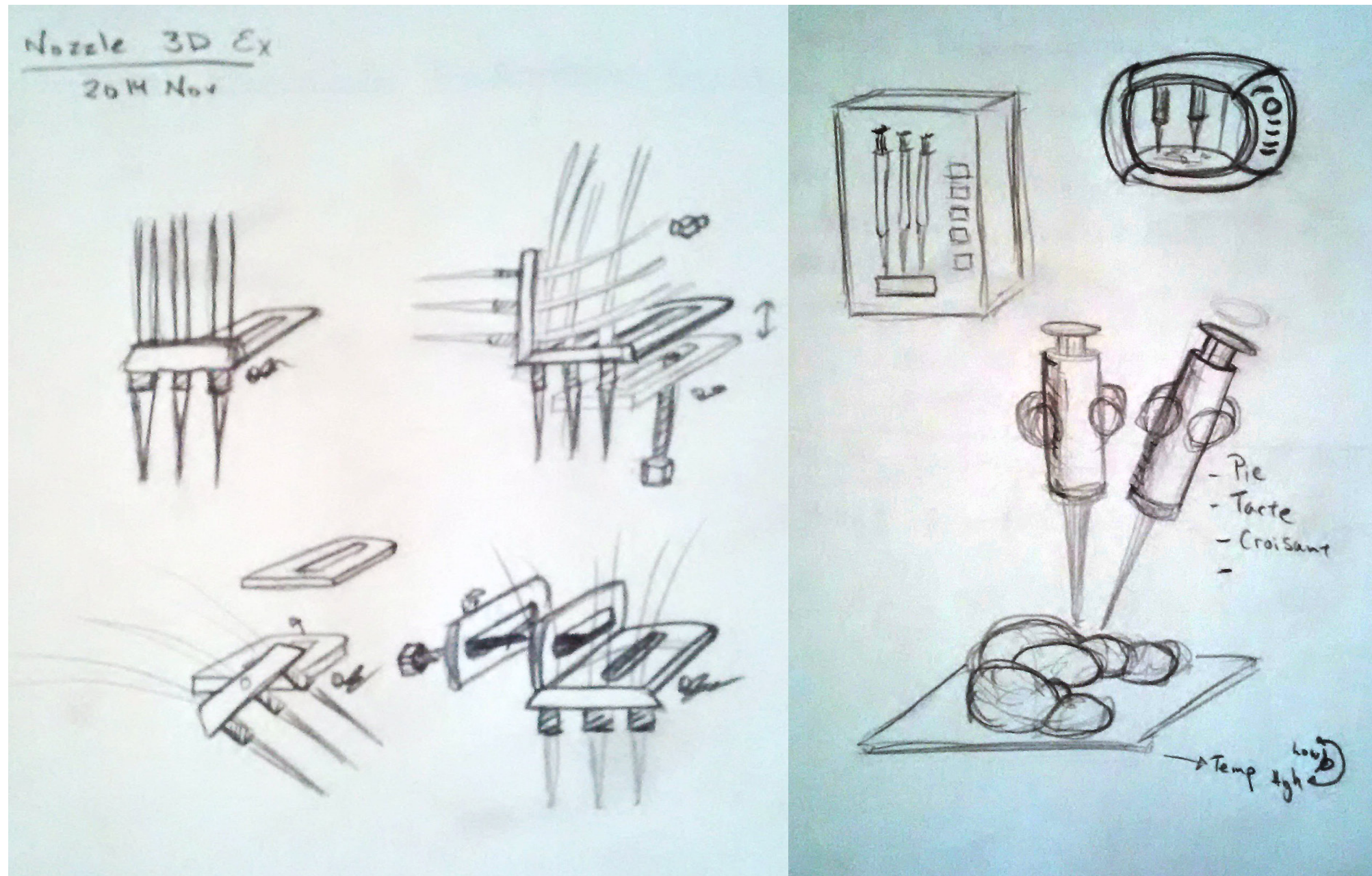
HOSTING and DATABASE

5\$ webhosting
15\$ URL yearly

Home page.

Home / Product info / Newsletter / Purchase / Contact





24-11-2014

CONSTANTINOS PAPACONSTANTINOU
Nozzle idea development:

- Multiple extrusion for baking.
- Dispenser for public places.
- Cooking oven unit for homes.
- Multiple nozzle extrusion.

794 Valve

Auger valve system for precise, consistent fluid application.

The 794 Series auger valve system is designed to make precise, repeatable deposits of solder paste.

By integrating screw feed technology with precise control of dispense time, syringe pressure and auger speed, the 794 Series system ensures consistent deposits without damage to the metal alloy particles in the solder paste.

794 Series Auger Valves

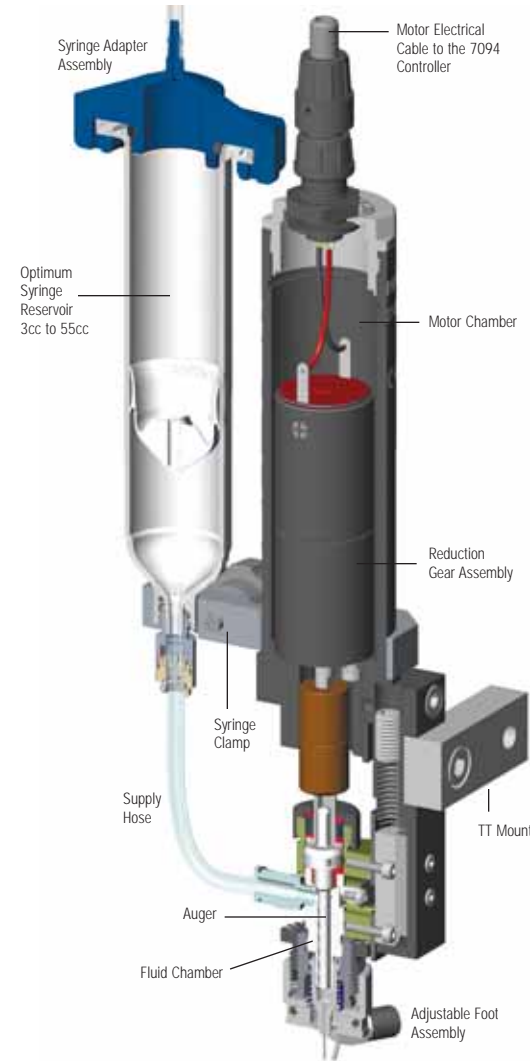
The 794 Series auger valves are designed for use with the 7094BL and 7094DC controllers or XYZ dispensing robots like the EFD TT automation system.

During operation, air pressure applied to the syringe of solder moves paste into the path of the auger. As the auger rotates, solder paste moves along the threads and out the dispensing tip.

The 7094BL and 7094DC controllers regulate feed pressure so that there is enough pressure to keep the valve primed with solder without forcing it past the auger, and controls dispense time and auger speed.

Features and Benefits

- Accurate, consistent output
- Adjustable flow rate
- I/O interface
- Adjustable auger speed
- 8 pitch or 16 pitch auger
- Two motor-styles – brush or brushless
- Low-maintenance design
- Fast, tool-free latch release of wetted parts
- Sliding head/footed tip components for surface irregularities and to maintain consistent dispense gap height.
- Fixed head version for lines and stripes



794 Valve

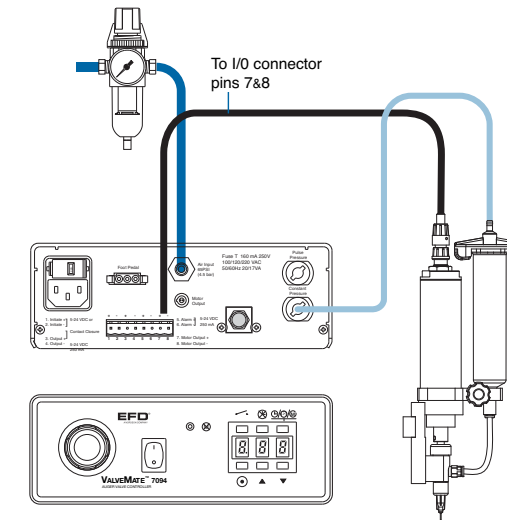
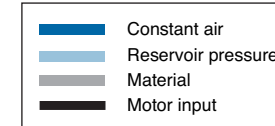
Auger valve systems

The 794 Series auger valves are available in brush and brushless motor configurations. Either configuration can be used with XYZ dispensing robots like EFD's TT automation system.

NOTE:

For Brushless Motor style 794 Auger Valves, use 7094BL controller.

For Brush Motor style 794 Auger Valves, use 7094DC controller.



ValveMate 7094BL and 7094DC Controllers

The ValveMate 7094 controller series regulate solder feed pressure, dispense time and auger speed. It provides motor startup acceleration limits and maximum current overload protection for extended motor life. The precision air pressure regulator ensures that consistent pressure is applied to the material in the syringe barrel.

- Easy deposit size control
- On-the-fly adjustability
- Motor voltage range of 10-24 VDC
- Digital time, pressure, voltage display
- Motor overload/fault detection

Automation: XYZ & XYZR Robot Dispensing Systems

Nordson EFD offers a wide selection of XYZ and XYZR robot systems that are fully compatible with ValveMate valve controller systems. Consistent, accurate, repeatable and complex dispensing applications can be easily performed with EFD robots, with working envelopes that range from 200 x 200 x 50mm to 510 x 510 x 100mm. Scara robot systems are also available for larger, heavier products or inline dispensing applications.

Solder Paste Reservoirs

The 794 Series auger valve can be supplied with solder paste from prefilled syringe barrels or cartridges. Contact EFD's Solder Paste Group for details: www.efdsolder.com.

Dispense Tips

Tip selection is critical to achieve optimum valve performance. In general, use the shortest and least restrictive tip possible to provide the best paste flow.

794 Series valves are packaged with a dispensing tip kit for maximum fluid control. The kit includes smooth-flow tapered tips in sizes from 14 to 22 gauge and 6.35 mm (1/4") precision stainless steel tips in sizes from 14 to 30 gauge, and tip caps.



Size: 237.4 mm x 31.7 mm diameter
(9.35" length x 1.25")
Weight: 544 grams (19.2 oz)
Fluid chamber: Type 440C hardened stainless steel
Auger: Type 440C hardened stainless steel
"U" cup: Filled PTFE, spring energized
Liquid feed fitting: Type 304SS #10-32x5/32" (push-in optional: polypro)
Auger speed: 250-400 RPM based on voltage input
Auger pitch: 8 and 16 pitch auger
Input Voltage: 12-24 VDC (<10% ripple)
Input Air: 0-30 psi (0-2.07 bar) clean and dry
Maximum Acceleration: 2g

All stainless steel parts are passivated.



For Nordson EFD LLC sales and service in over 30 countries, contact Nordson EFD or go to www.nordsonefd.com

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Singapore: +65 6796 9522
sin-mal@nordsonefd.com

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Mohamid Razi: Tonight we learned how to define single layer or multiple layers, and how to choose the best path to have less internal fast intersections.
P.S.: Go hats Go!





Tonight's progress:

- How to set separate shapes at one shot without extra thin connection lines.
- control fill density to make the infill smoothness. (The layers inside the letters are 3, but you see no borders between perimeter and infill)
- Sami and me made a good connection between softwares of "inkscape", "AutoCAD" and "Sketchup" with no loss in data while transmitting the files.

Future works:

- Designing more layers on one design while controlling the height of design (that depends on nozzle output diameter simultaneously)
- P.S. It's cold here in the workshop! we have serious problems working with chocolate.



DESIGN STANDARDS

A summary of the response message of “Canadian Food Inspection Agency”, once the list of selected materials, we will file an application for assessment to obtain a certificate of no objection from Health Canada.

Also response of MAPAQuebec, design and materials must:

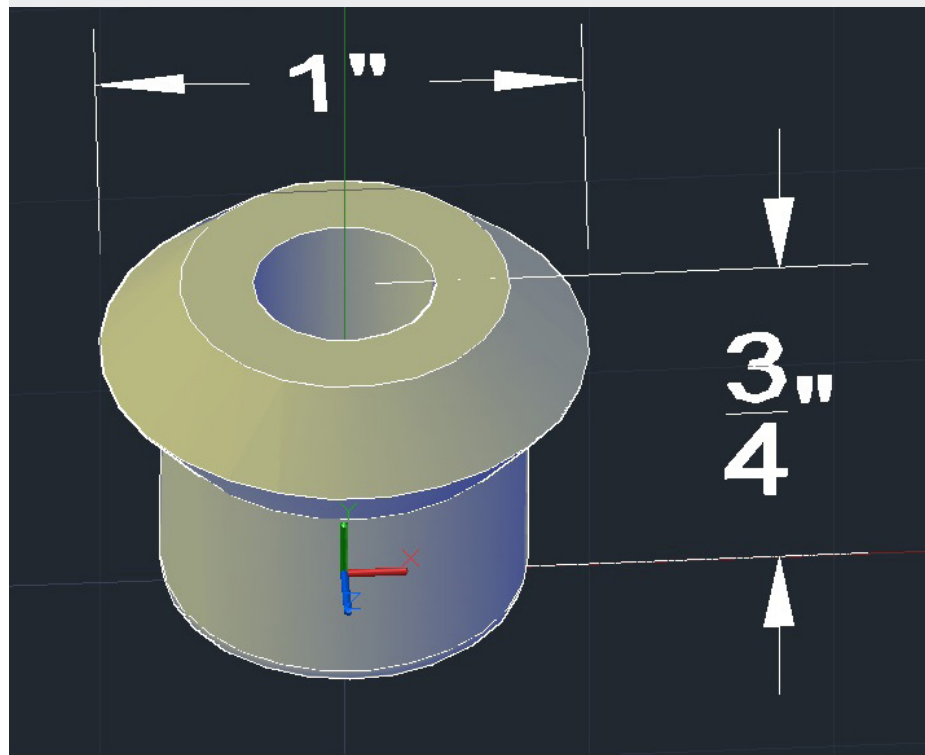
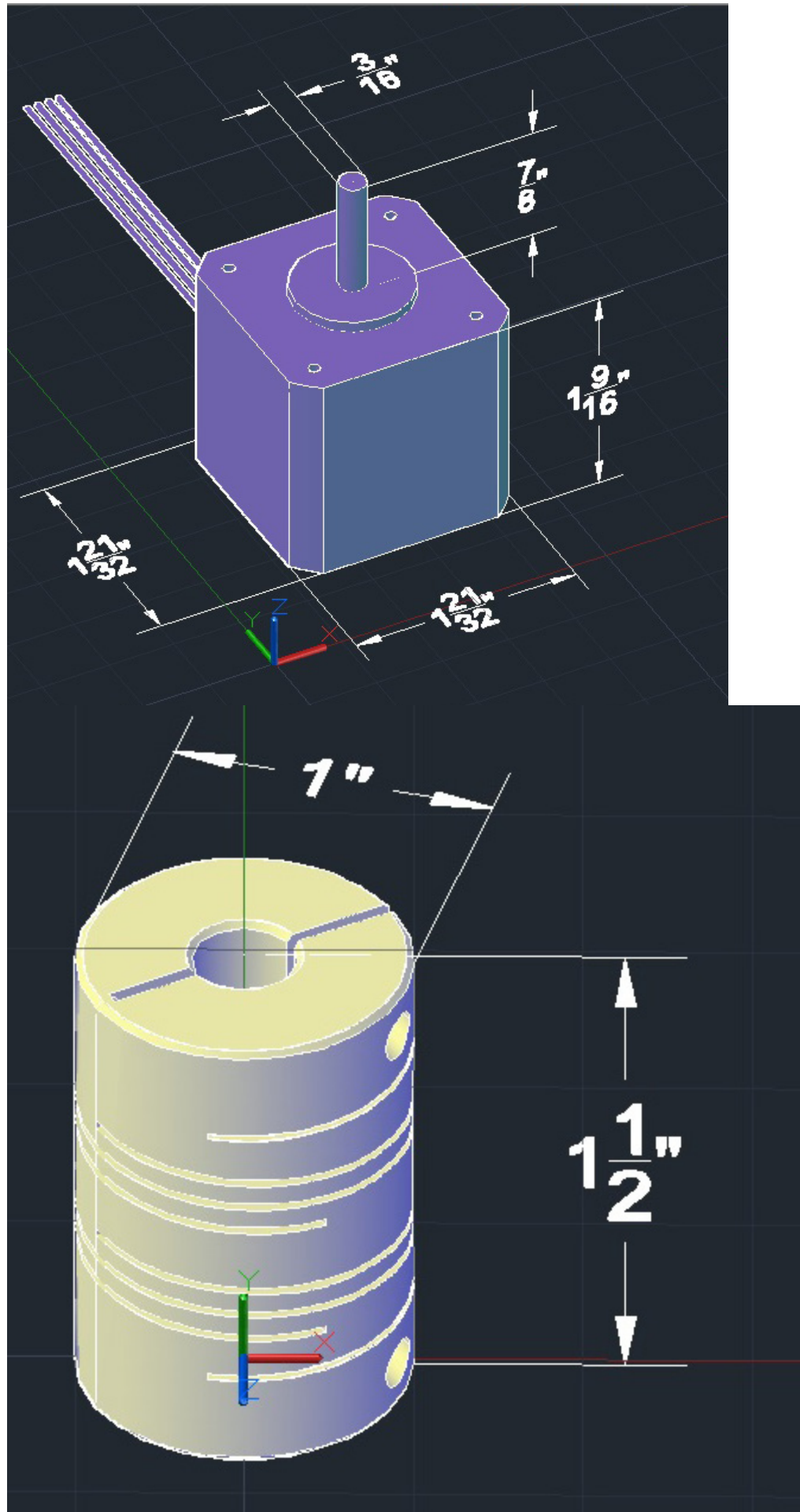
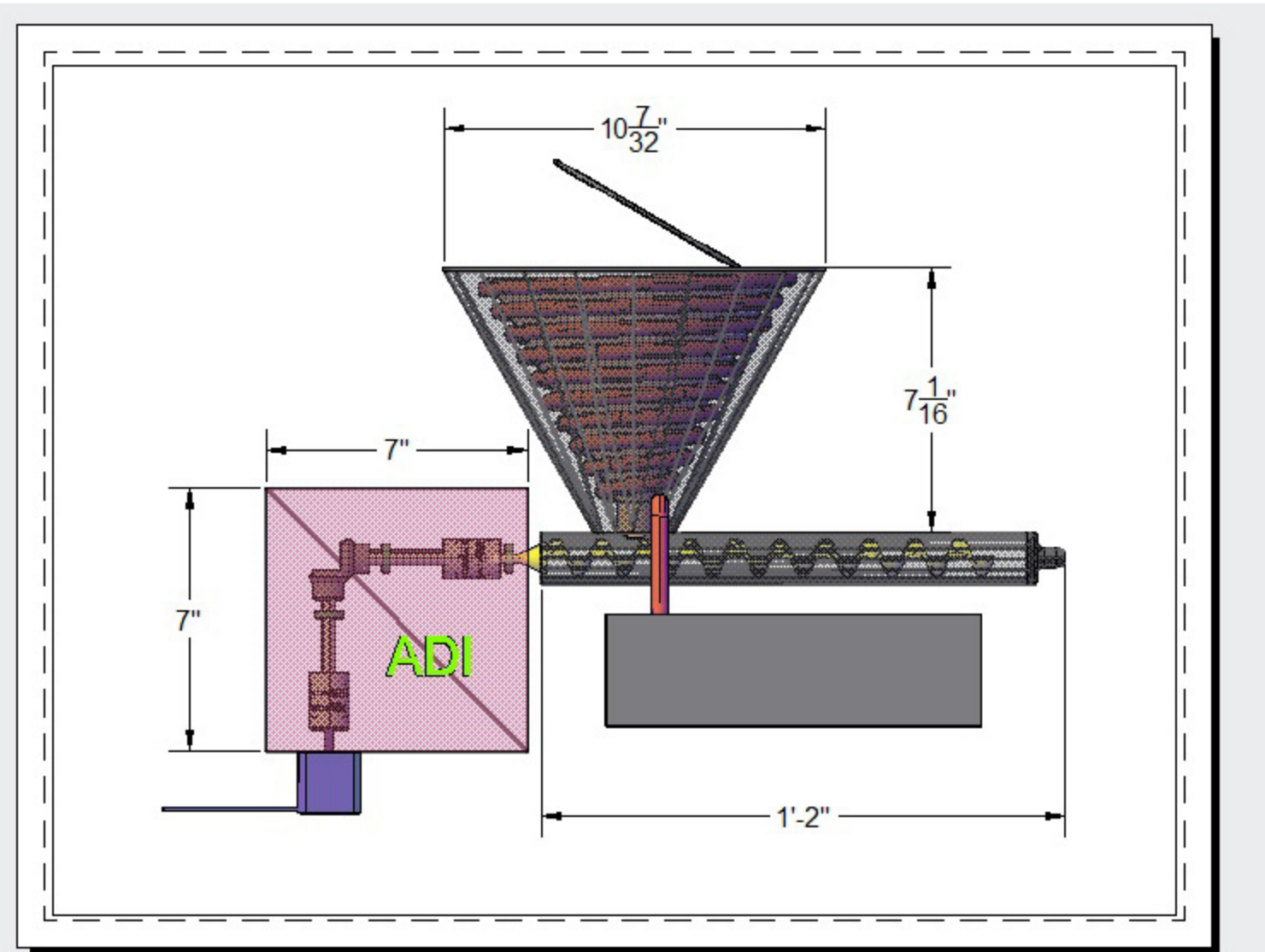
- 1 that can not be corroded;
- 2 withstands washing, cleaning or disinfecting;
3. Non-toxic and not state or in the process of decay;
4. nonabsorbent and waterproof;
5. unaffected by the products and manufactured not to alter the products.

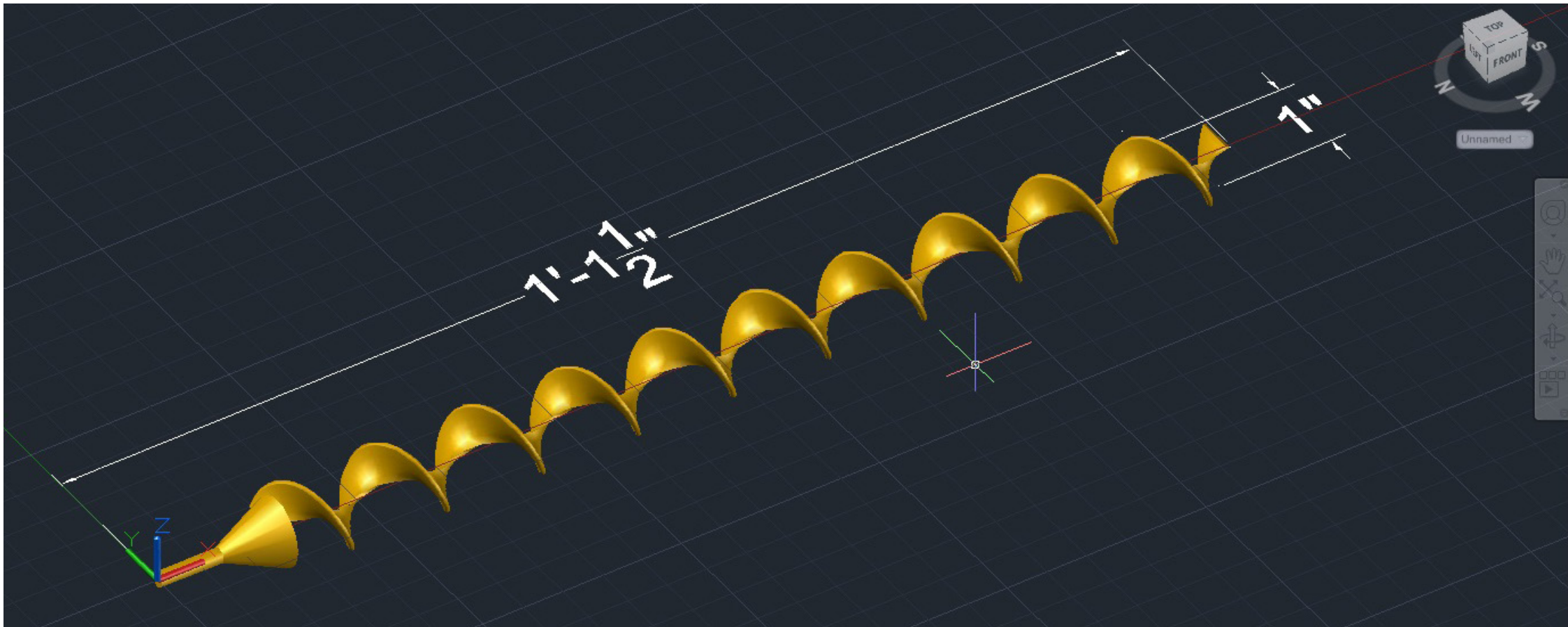
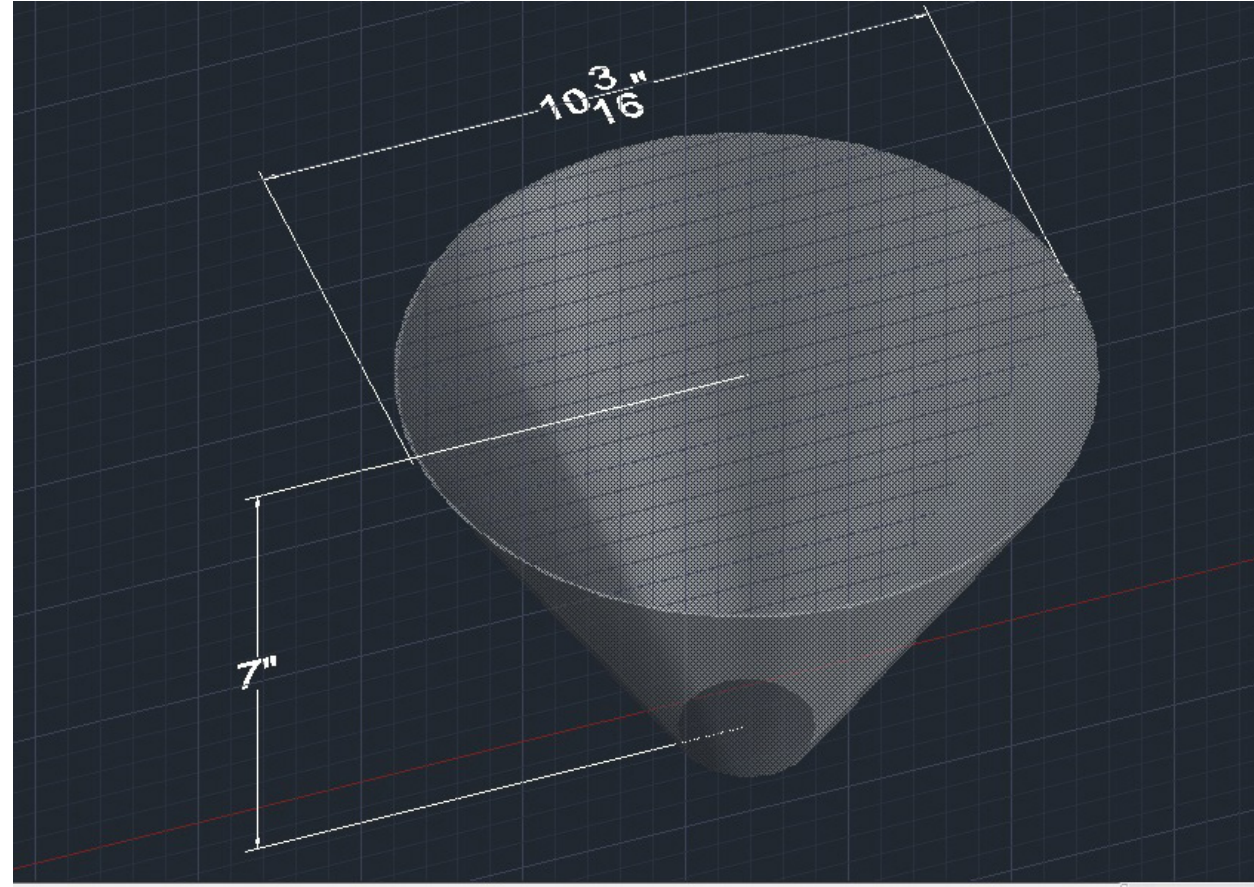
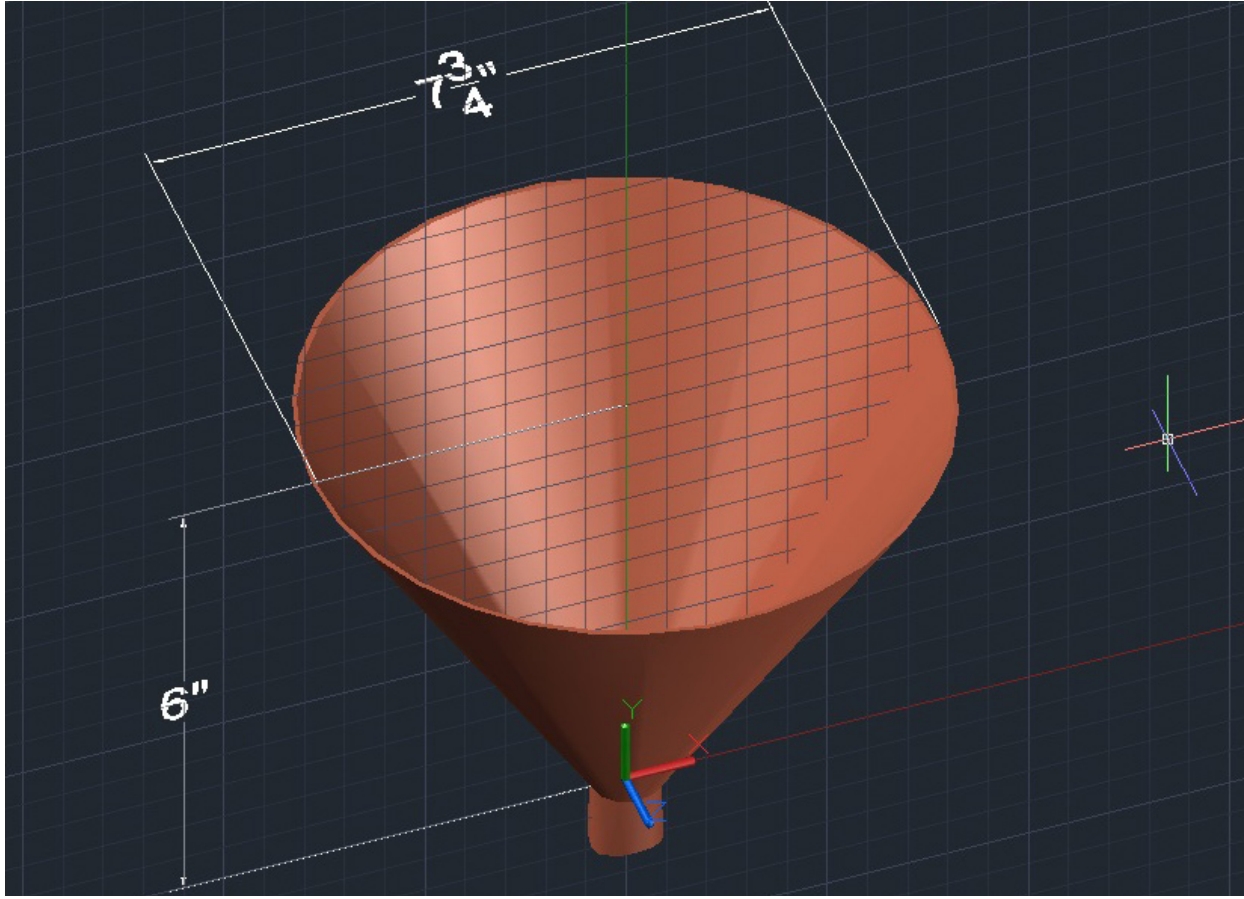
These surfaces must be free of loose particles, bumps or cracks to prevent residue build-up inside them. In addition, the materials and equipment manufactured by assembly other than by welding or impermeable seal must be detachable and each element must be accessible so as to allow washing, cleaning, disinfection and inspection.

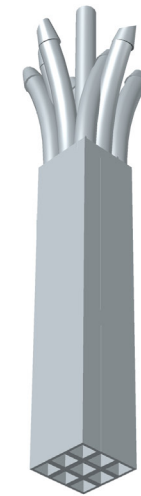
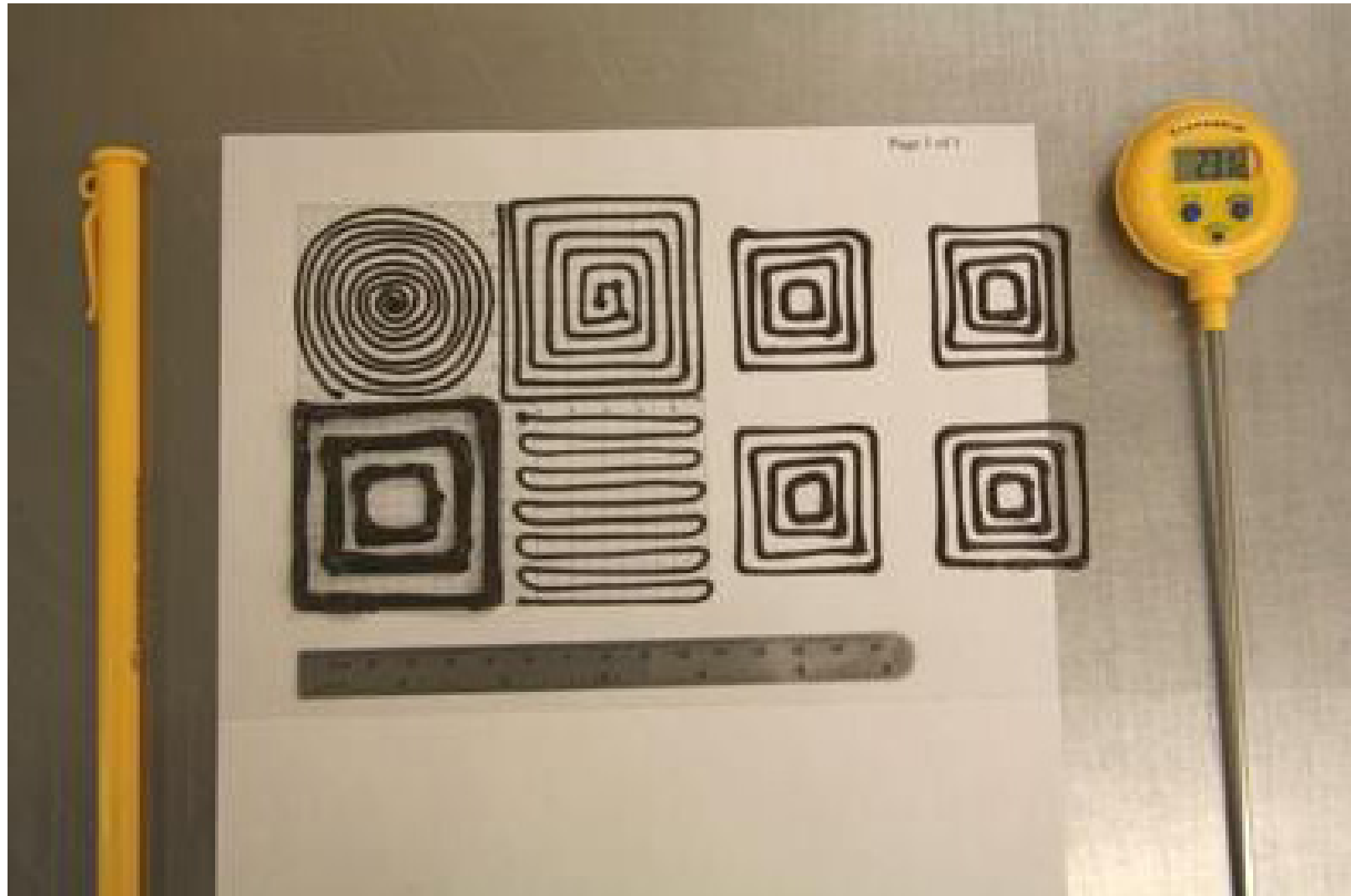
See you tomorrow

Sami









Tonight resume:

Proto base will be made of wood, then once validated one will be molded using Smoot-on onyx urethane who has a nice finish.

Proto water heater will use hacked parts from a Canadian Tire Cordless Electric Kettle.

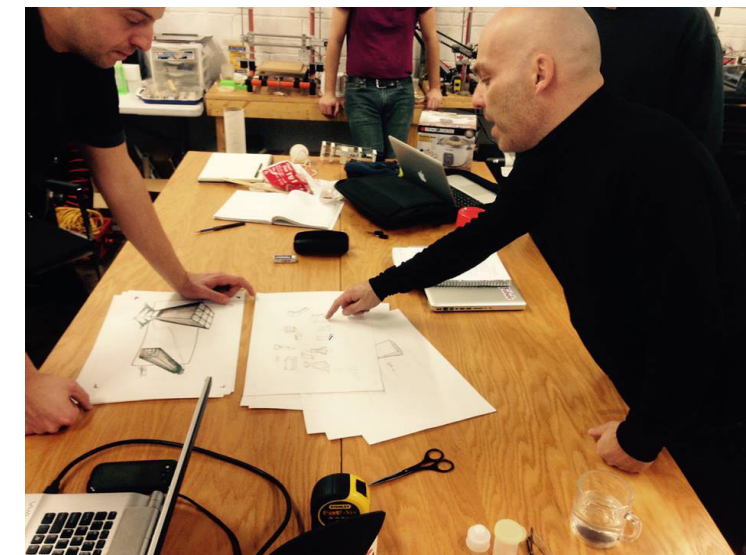
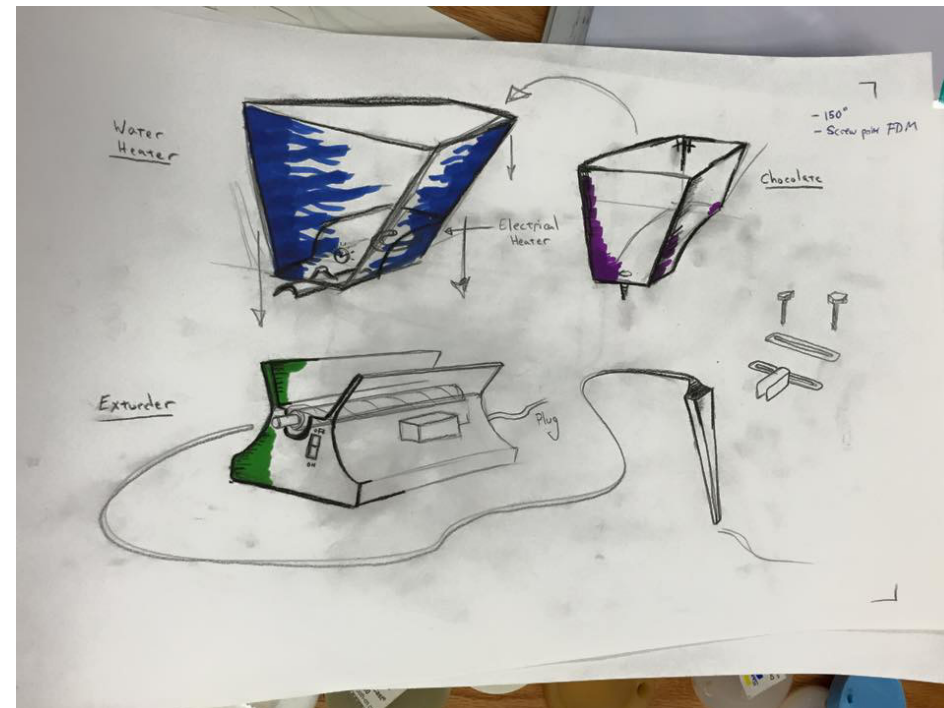
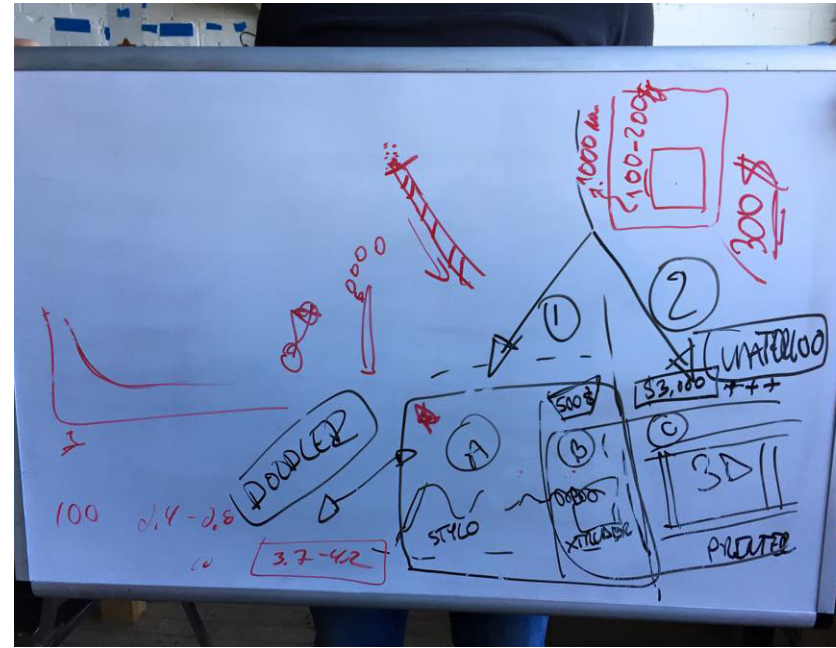
Mohammad will complete the BOM and send the specs to Dino for sizing of the base

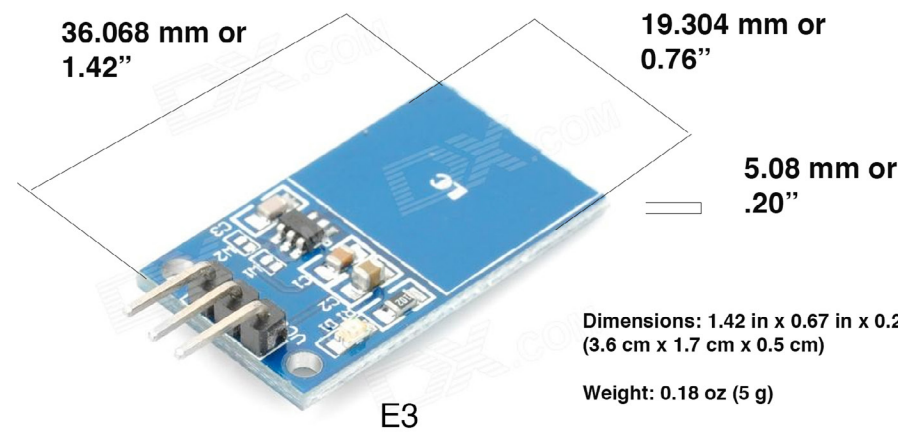
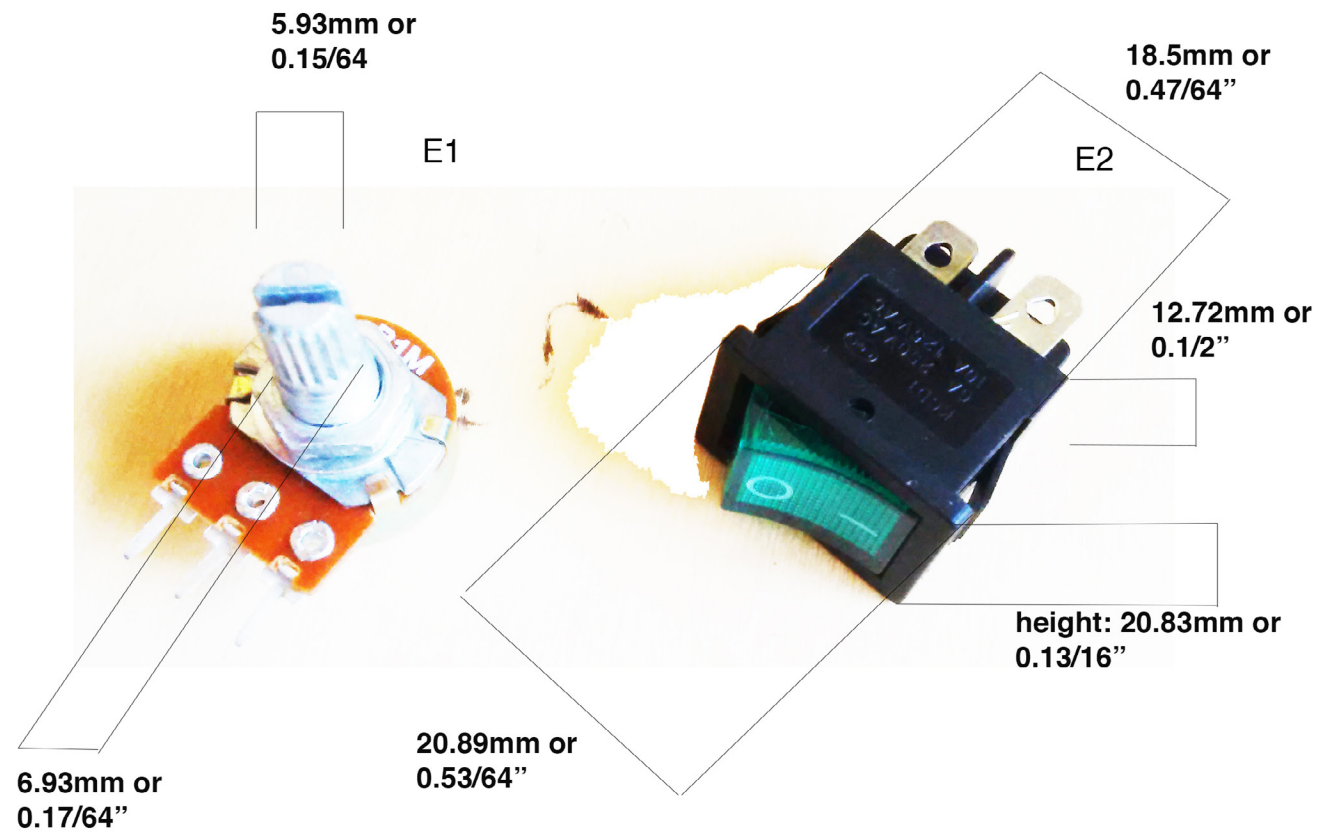
Mohammad will design the screw, Stephane will look to print one and have a mold made.

The design has to be made to reduce cost for production of the first run, since it will have to be done locally first, to reduce time to production.

Group will meet tomorrow night.

Manu was sick, he's gonna work on the kickstarter plan.





Dimensions: 1.42 in x 0.67 in x 0.20 in
(3.6 cm x 1.7 cm x 0.5 cm)

Weight: 0.18 oz (5 g)

	Material	Amount and Dimensions
E 2	On Off Switch	X 1
E1	Speed Control knob	X1
E3	Pen Touch Switch	X1

Designer: Constantinos Papaconstantinou
Engineer: Mohammad Razi
Construction Guide for Drill Extruder Part A
02 / 16 / 2015
Unit: mm & inches
Scale: 1.25 :1



Astable Standard 555 astable circuit

In astable mode, the 555 timer puts out a continuous stream of rectangular pulses having a specified frequency. Resistor R1 is connected between VCC and the discharge pin (pin 7) and another resistor (R2) is connected between the discharge pin (pin 7), and the trigger (pin 2) and threshold (pin 6) pins that share a common node. Hence the capacitor is charged through R1 and R2, and discharged only through R2, since pin 7 has low impedance to ground during output low intervals of the cycle, therefore discharging the capacitor.

In the astable mode, the frequency of the pulse stream depends on the values of R1, R2 and C:

$$f = \frac{1}{\ln(2) \cdot C \cdot (R_1 + 2R_2)} [8]$$

The high time from each pulse is given by:

$$\text{high} = \ln(2) \cdot (R_1 + R_2) \cdot C$$

and the low time from each pulse is given by:

$$\text{low} = \ln(2) \cdot R_2 \cdot C$$

where R1 and R2 are the values of the resistors in ohms and C is the value of the capacitor in farads.

The power capability of R1 must be greater than $\frac{V_{cc}^2}{R_1}$.

Particularly with bipolar 555s, low values of R1 must be avoided so that the output stays saturated near zero volts during discharge, as assumed by the above equation. Otherwise the output low time will be greater than calculated above. The first cycle will take appreciably longer than the calculated time, as the capacitor must charge from 0V to 2/3 of VCC from power-up, but only from 1/3 of VCC to 2/3 of VCC on subsequent cycles.

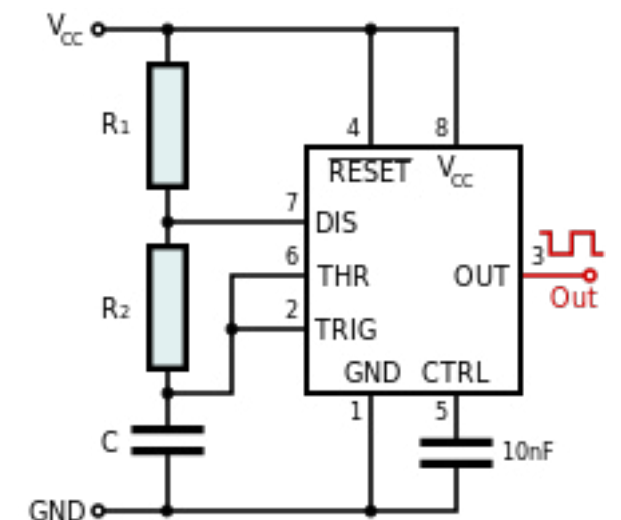
To achieve a duty cycle of less than 50% a small diode (that is fast enough for the application) can be placed in parallel with R2, with the cathode on the capacitor side. This bypasses R2 during the high part of the cycle so that

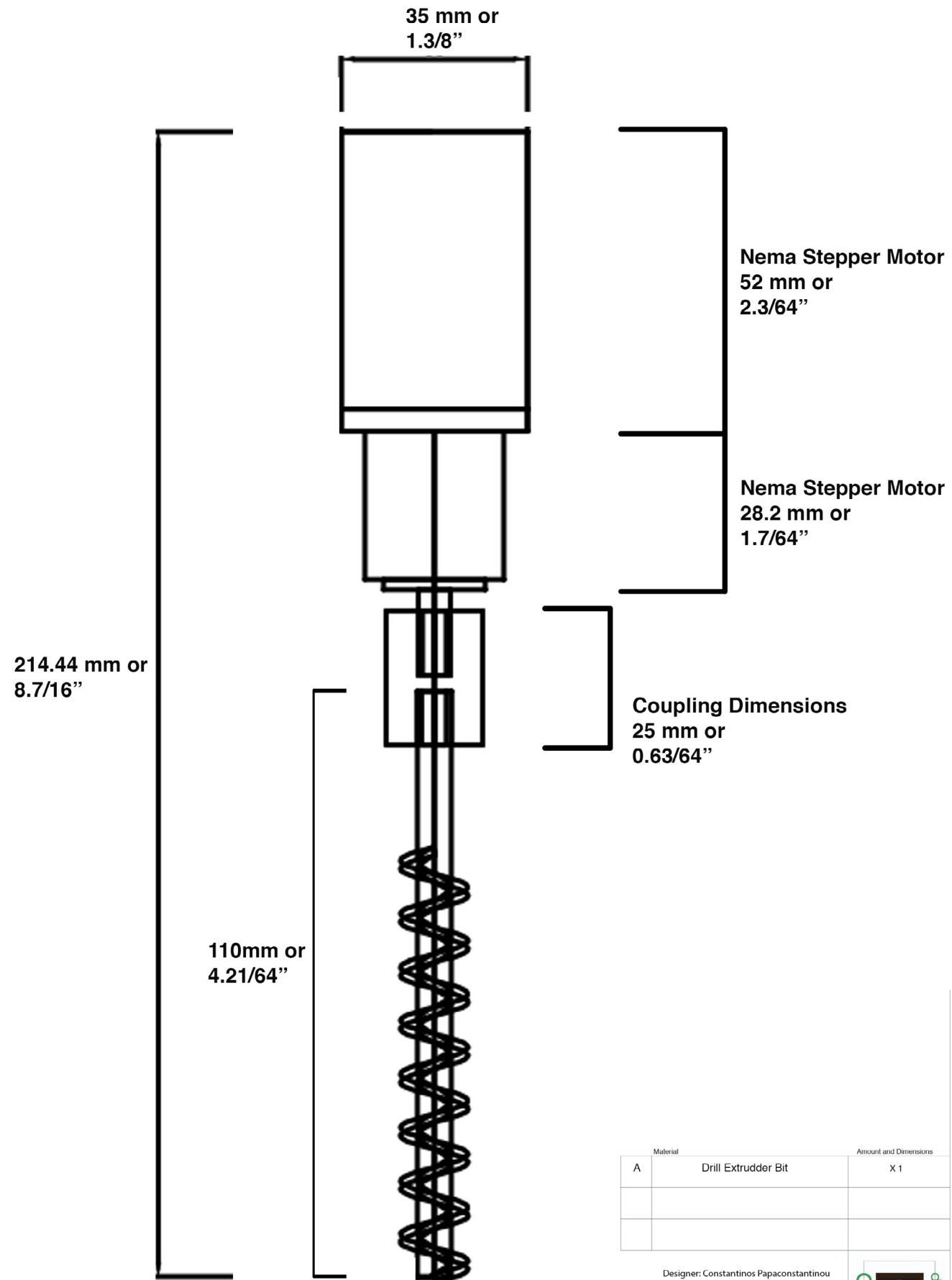
the high interval depends approximately only on R1 and C. The presence of the diode is a voltage drop that slows charging on the capacitor so that the high time is longer than the expected and often-cited $\ln(2) \cdot R_1 C = 0.693 R_1 C$. The low time will be the same as without the diode as shown above. With a diode, the high time is

$$\text{high} = R_1 C \cdot \ln\left(\frac{2V_{cc} - 3V_{\text{diode}}}{V_{cc} - 3V_{\text{diode}}}\right)$$

where Vdiode is when the diode has a current of 1/2 of Vcc/R1 which can be determined from its datasheet or by testing. As an extreme example, when Vcc= 5 and Vdiode= 0.7, high time = 1.00 R1C which is 45% longer than the "expected" 0.693 R1C. At the other extreme, when Vcc= 15 and Vdiode= 0.3, the high time = 0.725 R1C which is closer to the expected 0.693 R1C. The equation reduces to the expected 0.693 R1C if Vdiode= 0.

The operation of RESET in this mode is not well defined, some manufacturers' parts will hold the output state to what it was when RESET is taken low, others will send the output either high or low.

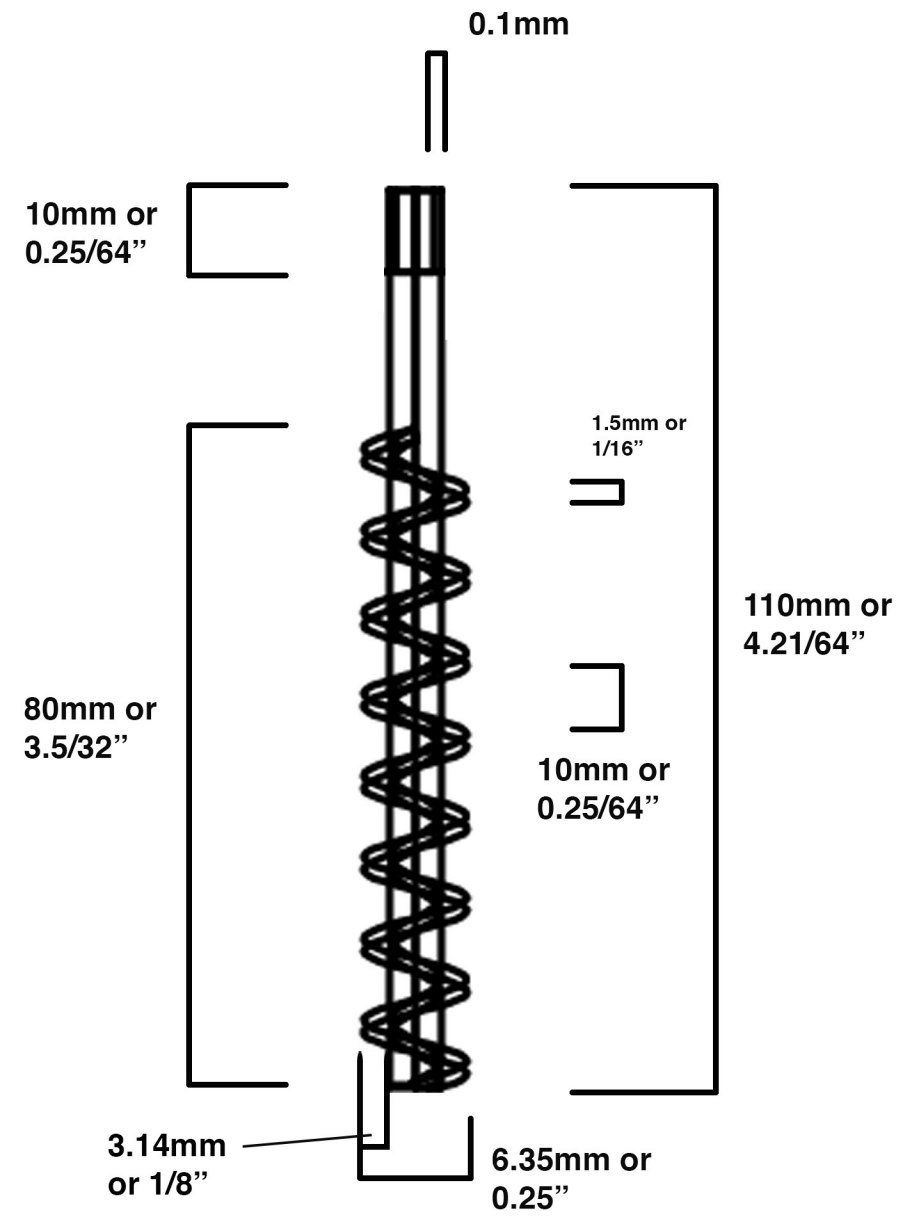




Material	Amount and Dimensions
A Drill Extruder Bit	X 1

Designer: Constantinos Papaconstantinou
 Engineer: Mohammad Razi
 Construction Guide for Drill Extruder Part A
 02 / 16 / 2015
 Unit: mm & inches
 Scale: 1:25:1





Material	Amount and Dimensions
A Drill Extruder Bit	X 1

Designer: Constantinos Papaconstantinou
 Engineer: Mohammad Razi
 Construction Guide for Drill Extruder Part A
 02 / 16 / 2015
 Unit: mm & inches
 Scale: 1.25 :1



CALLEBAUT

Spécification Article

BARRY CALLEBAUT CANADA INC.

2950 NELSON STREET
CDN-J2S 1Y7 ST. HYACINTHE
Canada

Article : 823NV-132

Dénomination légale : Chocolat de couverture au lait

Tarif Douanier : 1806.2010

Composition typique (Données inappropriées pour la demande des restitutions)

Sucre 42.0 % ; Beurre de cacao (5) 24.0 % ; Poudre de lait entier 22.5 % ; Pâte de cacao (5) 11.5 % ; Émulsifiant: lécithine de soja ; Arôme naturel de vanille (5) Growing Great Chocolate

Les produits ayant une DLUO allant jusqu'à 12/11/2013 ne contiennent pas de cocoa durable (GGC programme).

Conditionnement : 5x5kg bloc emballé individuellement, carton, palette perdue (1000 kg)

Critères chimiques

HUMIDITÉ	max 1.00 %				IOCCCI(1952)
MATIÈRE GRASSE	36.2 %	+/-1,5			IOCCCI4(1972)

Critères physiques

VISCOSITÉ LINÉAIRE	1,291 - 1,540 mPa.s				IOCCC10(1973)
Granulométrie : max. 3 % de la matière sèche et dégraissée > 30 microns					IOCCC38(1990)

Critères microbiologiques

	n	c	m	M	Réf.Méthode
GERMES TOTAUX	5	2	1000/g	5000/g	ISO4833
LEVURES	5	2	10/g	50/g	ISO7954
MOISSISSURES	5	2	10/g	50/g	ISO7954
ENTEROBACTÉRIACEAE	5	2	0/g	10/g	ISO21528-2
COLIFORMES	5	2	0/g	10/g	ISO4832
E.COLI	5	0	0/g	0/g	ISO16649-2
SALMONELLES	15	0	0/25g	0/25g	ISO6579

Dimensions standard

Pas spécifié

Date limite d'utilisation optimale (DLUO) et recommandations de stockage

18 mois après date de production

Température de stockage : 12 - 20 °C

Entreposer le produit dans un local propre, sec (humidité relative max.70 %) et sans odeur.

Informations nutritionnelles pour 100 g (valeurs calculées d'après les données bibliographiques)

VALEUR ÉNERGÉTIQUE	563 kcal	MATIÈRE GRASSE TOTALE	36.2 g
PROTÉINES TOTALES	7.0 g	ACIDES GRAS SATURÉS	22.9 g

Article : 823NV-132

Barry Callebaut Belgium nv - AALSTERSESTRAAT 122
9280 LEBBEKE-WIEZE - BELGIQUE -
Tel : 053/730211 Fax : 053/780463

Client : 2923

Type : EU - Limited nutri -PRD

12/09/2012 p 1 / 3

07 JAN. 2015

LR

Sami Pean:

I never find the same logo like in your board: Viscosity Vacuum. pdf, from my research or from my suppliers responding...

(...)The unit of viscosity is Pascal second (Pa.s), while, in practice, milli-Pascal second (mPa.s) is often used. One Pa.s = 1000 mPa.s. The unit of yield value is Pascal (Pa.)

The average values of liquid chocolate for (solid moulded) bars are:

viscosity: between 1 and 20 Pa.s;

yield value: between 10 and 200 Pa. (...)

(we'll use like this (solid moulded bars) for our extruder application, chocolate around 55% cocoa (between 50% and 64% (.more it will be thick, heavy). And for using around between 30 and 34 celsius degrees.

<http://www.cacaochocolade.nl/main.php?lng=1&p=inhoud&h=5&g=1&s=7&z=0&sp=>
For more informations read all page ;)

Also chocolate viscosity unit Poise
<http://en.wikipedia.org/wiki/Poise>



Les produits ayant une DLUO allant jusqu'à 12/11/2013 ne contiennent

Conditionnement : 5x5kg bloc emballé individuellement, carton, palett

Critères chimiques

HUMIDITÉ	max 1.00 %
MATIÈRE GRASSE	36.2 %

Critères physiques

VISCOSITÉ LINÉAIRE 1,291 - 1,540 mPa.s

Granulométrie : max. 3 % de la matière sèche et dégraissée > 30 microns.

Critères microbiologiques

	n	c
GERMES TOTAUX	5	2
LEVURES	5	2
MOISSURES	5	2
ENTEROBACTÉRIACEAE	5	2

	Liquid: 4 weeks at max. 45 °C under continuous stirring		
Colour:	dunkelbraun / dark brown		

2. Composition according to Kakao-VO (EC legislation)

All values correspond to the chocolate compounds, the sum of that will be set to 100.

Chocolate content:	approx 98,49 %	Total fat content:	approx 38,17 %
Cocoa content:	min. 64,68 %	Milk content:	min. 1,02 %
Cocoa fat:	approx 37,15 %	Milk fat:	approx 1,02 %
Fat free cocoa dry mass:	approx 27,52 %	Fat free milk dry mass:	approx 0,00 %
		vegetable fat (not cocoa fat):	approx %
Sucrose:	approx 35,32 %	Sugars:	approx 35,32 %

3. Chemical and physical Data

The content is the analytical value related to 100 gram product.

	Method	Minimum	Maximum	
Cocoa content:		63,70		%
Milk content:		1,00		%
Total fat content:	(NIR spectroscopic)	approx 37,90		%
Water content:	(NIR spectroscopic)		1,00	%
Residue calc. on fat free mass	(sieve with µm-sieve)	-	8,00	% >30 µm
				% >75 µm
Viscosity (Casson) :	(IOCCC 10/1973:2000)	0,80 -	1,10	Pa*s
Yield limit (Casson):	(IOCCC 10/1973:2000)	5,00 -	9,00	Pa
Remarks:	The measurement for viscosity is done by a Haake Rotationsviskosimeter at 40,0 +/- 0,1 °C			

Approximate Viscosities of Common Liquids

The viscosity of a fluid is the measure of its resistance to a shearing force. This condition is found when initiating and sustaining flow. As an example, higher viscosity fluids require a greater force to flow than do lower viscosity fluids. Some fluids display differing viscosity characteristics. Newtonian (N) fluids have constant viscosity at a given temperature regardless of fluid flow rate. Water and most oils are Newtonian. Thixotropic (T) fluids decrease in viscosity as the rate of shear increases. Initiating flow is difficult with thixotropic fluids but eases once flow commences. Liquids such as adhesives, greases, waxes, and latex are thixotropic.

LiquidType	Specific Gravity at 60°F	Absolute Viscosity cp	Temperature °F	Viscosity Type	LiquidType	Specific Gravity at 60°F	Absolute Viscosity cp	Temperature °F	Viscosity Type
Dairy Products					Food Products Continued				
Butter Fat	1.0	42	110	N	Custard	1.6	1500	185-195	T
Butter Fat	1.0	20	150	N	Edible Oil	0.9	65	70	N
Butter Deodorized	1.0	45	120	N	Emulsifier	—	20	70	T
Cottage Cheese	—	30,000	65	T	Gelatin 37% Solids	—	1190	110	T
Cocoa Butter	0.92	50	140	N	Glucose	1.3	4300-8600	75-85	T
Cocoa Butter	0.87	0.5	210	N	Gravy Slurry	1.0	11	175	T
Condensed Milk	—	40-80	100-120	N	Fruit Juice	1.04	55-75	65	N
Condensed Milk, 75% Solids	1.3	2160	70	T	Honey	1.5	1500	100	—
Cream 30% Fat	1.0	14	60	N	Hot Fudge	1.1	36,000	120	T
Cream 40% Fat	0.99	48	60	N	Jam Garnish	—	8440	60	T
Cream 50% Fat	0.98	112	60	N	Malt Extract 80%	—	9500	65	T
Cream 50% Fat	—	55	90	N	Malt Extract	1.4	3000	140	T
Milk	1.02-1.05	2.0	65	N	Mashed Potato	1.0	20,000	100	T
Milk	1.02-1.05	1.0	120	N	Mayonnaise	1.0	20,000	70	T
Milk Whey 48% Sugar	—	800-1500	100	T	Mincemeat	—	100,000	85	T
Process Cheese	—	6500	175	T	Molasses	1.5	1400-13,000	100	—
Process Cheese	—	30,000	65	T	Mousse Mix	—	1200	40	T
Whole Egg	0.5	150	40	T	Pablum	—	4,500	100	T
Yoghurt	1.15	152	105	T	Pear Pulp	—	4,000	160	T
Food Products					Food Products Continued				
Batter	1.0	29,500	85	T	Pectin	—	345	80	N
Baby Food	—	1400	200	T	Pet Food	1.0	11,000	40	T
Beer	1.0	1.1	40	N	Prune Juice	1.0	60	120	T
Beet Sauce	—	1950	170	T	Orange Juice Concentrate (30 Brix)	—	630	70	N
Brewers Yeast	—	368	65	T	Orange Juice Concentrate (30 Brix)	—	91	175	N
Brewers Yeast, 80% Solids	—	16,000	40	T	Orange Juice Concentrate (50 Brix)	—	2410	70	N
Broth Mix	—	430	65	T	Orange Juice Concentrate (30 Brix)	—	330	175	N
Cake Frosting	1.0	10,000	70	T	Rice Pudding	—	10,000	210	T
Caramel	1.2	400	140	—	Salad Cream	—	1300-2600	65	T
Carob Bean Sauce	—	1500	85	T	Sauce-Apple	1.1	500	175	T
Chocolate	1.1	17,000	120	T	Sorbitol	1.29	200	70	N
Chocolate Milk	—	280	120	T	Soybean Slurry	—	5000-10,000	120-195	T
Citrus Fruit Pulp	1.27	600	70	T	Tapioca Pudding	0.7	1000	235	T
Coffee 30-40% Liquor	—	10-100	70	T	Toffee	1.2	87,000	100	T
Condensed Milk, 77% Sweetened	1.3	10,000	70	N	Tomato Catsup	1.2	1000	85	T
Cookie Cream Premix	—	29,200	65	T	Tomato Paste 30%	1.1	195	65	T
Corn Starch	1.2	300	85	T	Vinegar	—	12-15	70	N
Corn Syrup	1.5	12,000	130	—	Yeast Slurry	—	20	65	T
Cream Style Corn	—	130	190	T					



CHO 21020



Contact:
Pro Gourmet Foods LCC
3643 Beach Drive E
Port Orchard, WA 983
Tel: (360) 769 7420
Fax: (360) 871 6539

Product – specification

article	Stuttgart Dark 64%				
Version No.	0.02 from	Origin:	Equador		
Sample Status:	J/Y	Status J/Y – the specification is provisionally.			
Article / German trade name:	# 3468 Superior Dark Chocolate according to Kakao-VO 15.12.2003 (EC legislation)				
Declaration Kakao-VO (EC legislation):	64,68 cocoa content / 35,32 sucrose / 37,90 fat content analytical				
certified:	Org EU:	Org NOP:	Org Suisse:	Fairtrade:	Rainforest Alliance:
	N	N	N	N	N

1. product description

Shelf life:	Solid: 18 months at 15 - 20 °C, relative humidity < 60 % Liquid: 4 weeks at max. 45 °C under continuous stirring
Colour:	dunkelbraun / dark brown

2. Composition according to Kakao-VO (EC legislation)

All values correspond to the chocolate compounds, the sum of that will be set to 100.

Chocolate content:	approx 98,49 %	Total fat content:	approx 38,17 %
Cocoa content:	min. 64,68 %	Milk content:	min. 1,02 %
Cocoa fat:	approx 37,15 %	Milk fat:	approx 1,02 %
Fat free cocoa dry mass:	approx 27,52 %	Fat free milk dry mass:	approx 0,00 %
		vegetable fat (not cocoa fat):	approx %
Sucrose:	approx 35,32 %	Sugars:	approx 35,32 %

3. Chemical and physical Data

The content is the analytical value related to 100 gram product.

	Method	Minimum	Maximum	
Cocoa content:		63,70		%
Milk content:		1,00		%
Total fat content:	(NIR spectroscopic)	approx 37,90		%
Water content:	(NIR spectroscopic)		1,00	%
Residue calc. on fat free mass	(sieve with µm-sieve)		8,00	% >30 µm
				% >75 µm
Viscosity (Casson) :	(IOCCC 10/1973:2000)	0,80 -	1,10	Pa*s
Yield limit (Casson):	(IOCCC 10/1973:2000)	5,00 -	9,00	Pa
Remarks:	The measurement for viscosity is done by a Haake Rotationsviskosimeter at 40,0 +/- 0,1 °C			



CH021018
 Chocolat blanc
 Bloc.

5kg

Contact:
 Pro Gourmet Foods LCC
 3643 Beach Drive E
 Port Orchard, WA 983
 Tel: (360) 769 7420
 Fax: (360) 871 6539

Product – specification

article	Bavarian White				
Version No.	1.00 from 11.08.2010	Origin:	keine		
Sample Status:	N	Status J/Y – the specification is provisionally.			
Article / German trade name:	# 2979 White Chocolate according to Kakao-VO 15.12.2003 (EC legislation)				
Declaration Kakao-VO (EC legislation):	29,85 cocoa content / 46,53 sucrose / 36,12 fat content analytical				
certified:	Org EU: N	Org NOP: N	Org Suisse: N	Fairtrade: N	Rainforest Alliance: N

1. product description

Shelf life:	Solid: 12 months at 15 - 20 °C, relative humidity < 60 % Liquid: 4 weeks at max. 45 °C under continuous stirring
Colour:	weiss / white

2. Composition according to Kakao-VO (EC legislation)

All values correspond to the chocolate compounds, the sum of that will be set to 100.

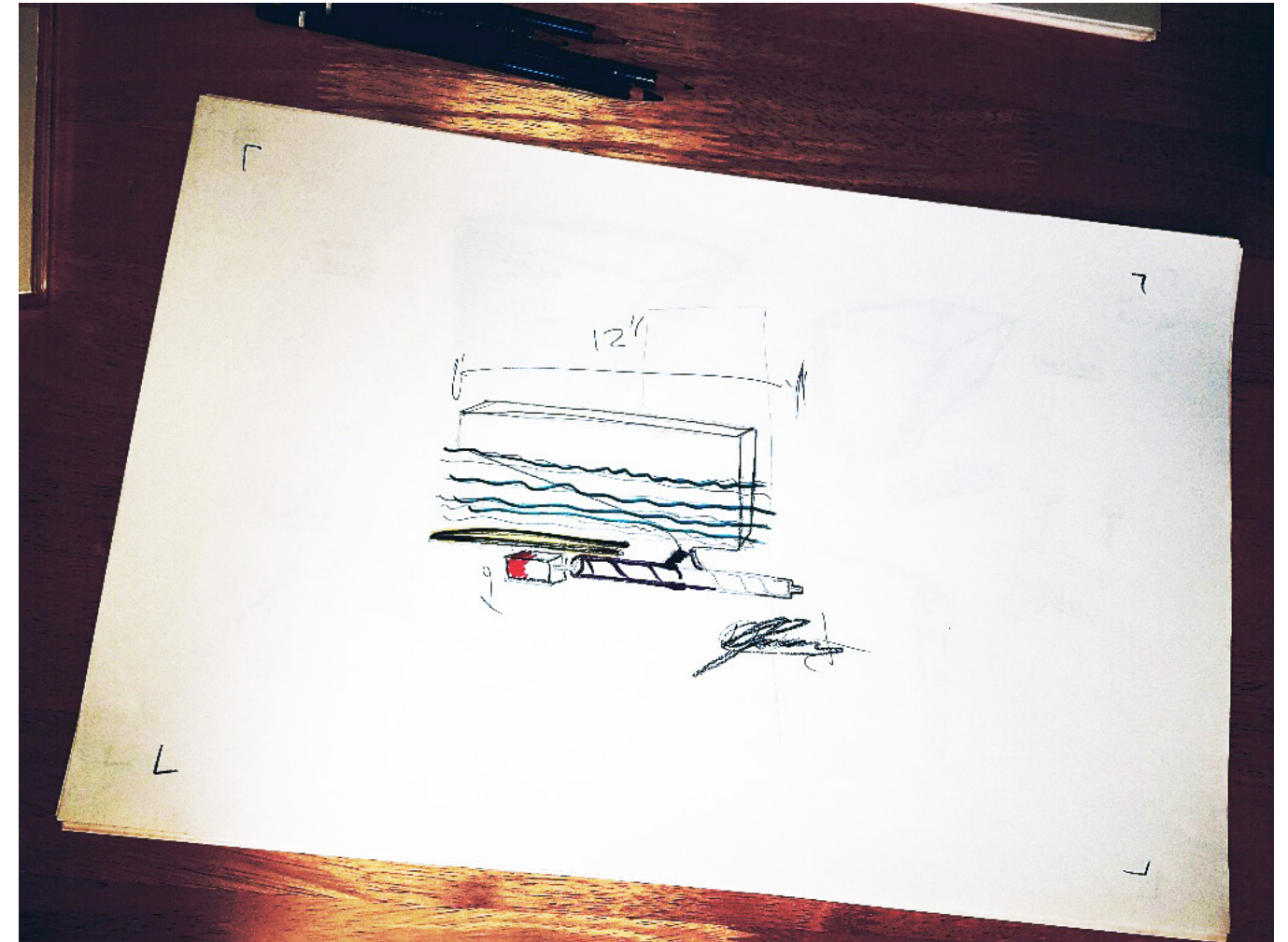
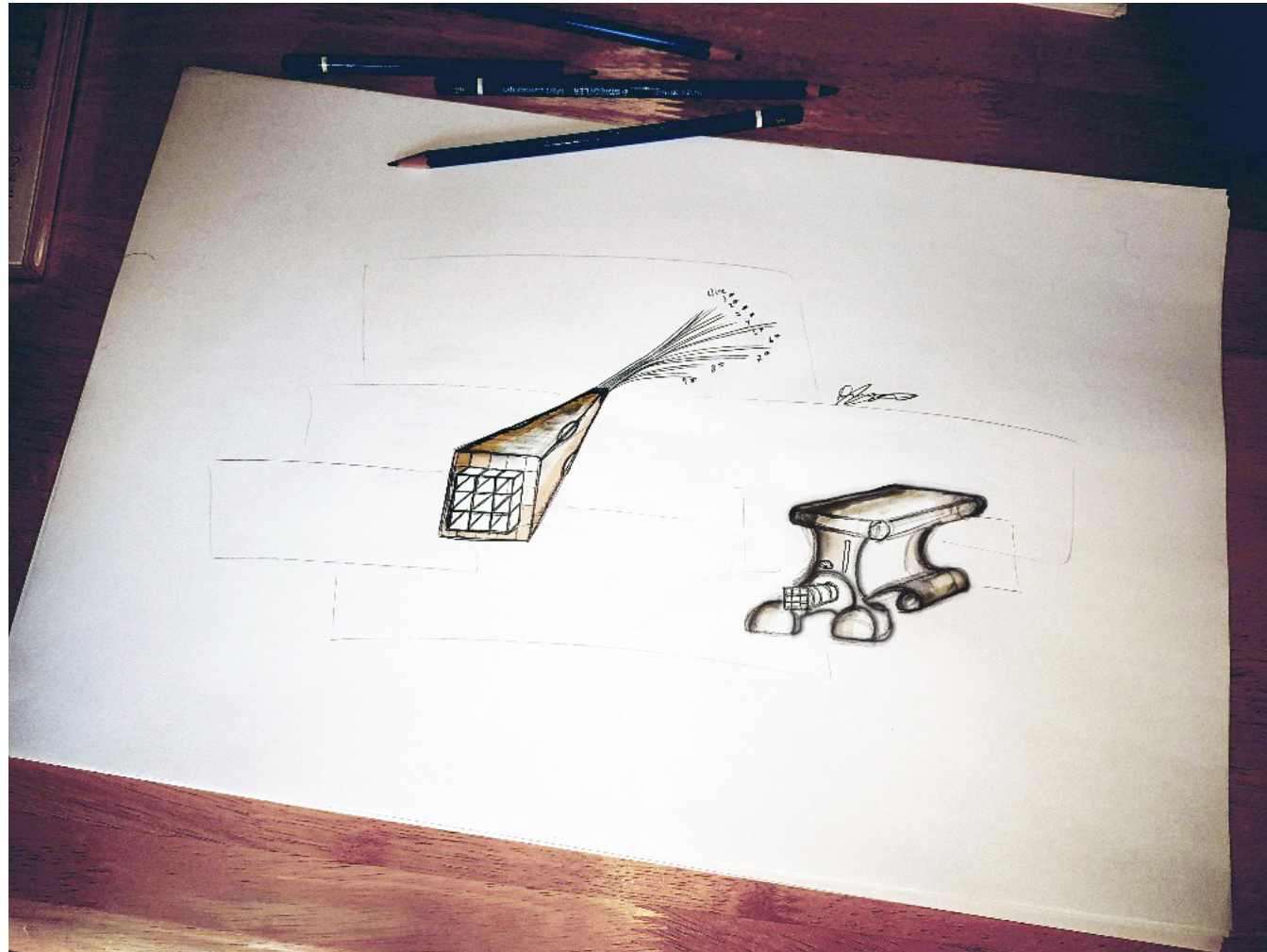
Chocolate content:	approx 99,50 %	Total fat content:	approx 35,99 %
Cocoa content:	min. 29,85 %	Milk content:	min. 23,62 %
Cocoa fat:	approx 29,85 %	Milk fat:	approx 6,14 %
Fat free cocoa dry mass:	approx %	Fat free milk dry mass:	approx 17,48 %
Sucrose:	approx 46,53 %	vegetable fat (not cocoa fat):	approx %
		Sugars:	approx 46,53 %

3. Chemical and physical Data

The content is the analytical value related to 100 gram product.

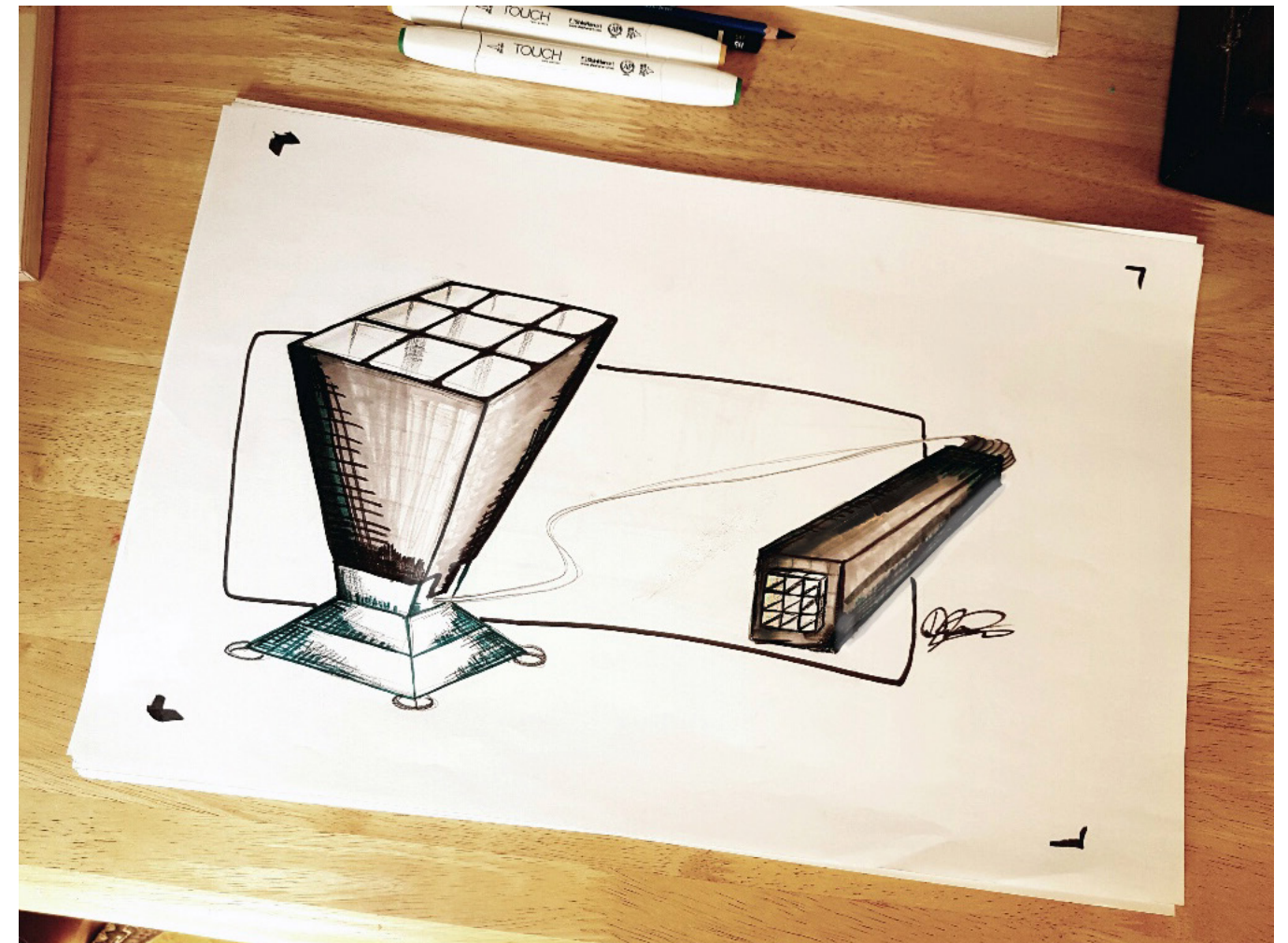
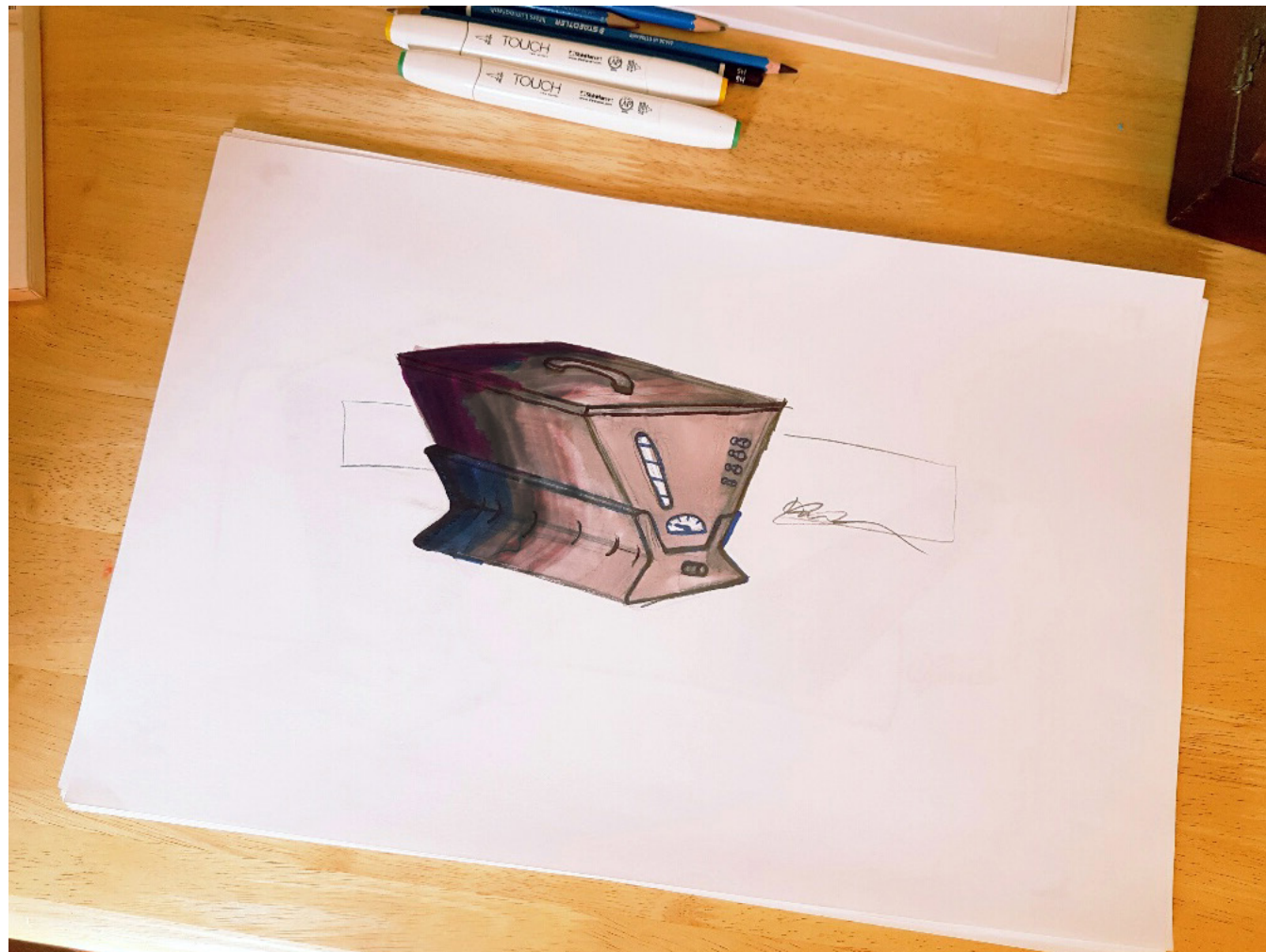
	Method	Minimum	Maximum	
Cocoa content:		29,70		%
Milk content:		23,50		%
Total fat content:	(NIR spectroscopic)	approx 36,12		%
Water content:	(NIR spectroscopic)		1,00	%
Residue calc. on fat free mass	(sieve with µm-sieves)	-	8,00	% > 30 µm
Viscosity (Casson) :	(IOCCC 10/1973:2000)	1,00 -	1,60	% > 75 µm
Yield limit (Casson):	(IOCCC 10/1973:2000)	6,00 -	9,00	Pa*s
Remarks:	The measurement for viscosity is done by a Haake Rotationsviskosimeter at 40,0 +/- 0,1 °C			





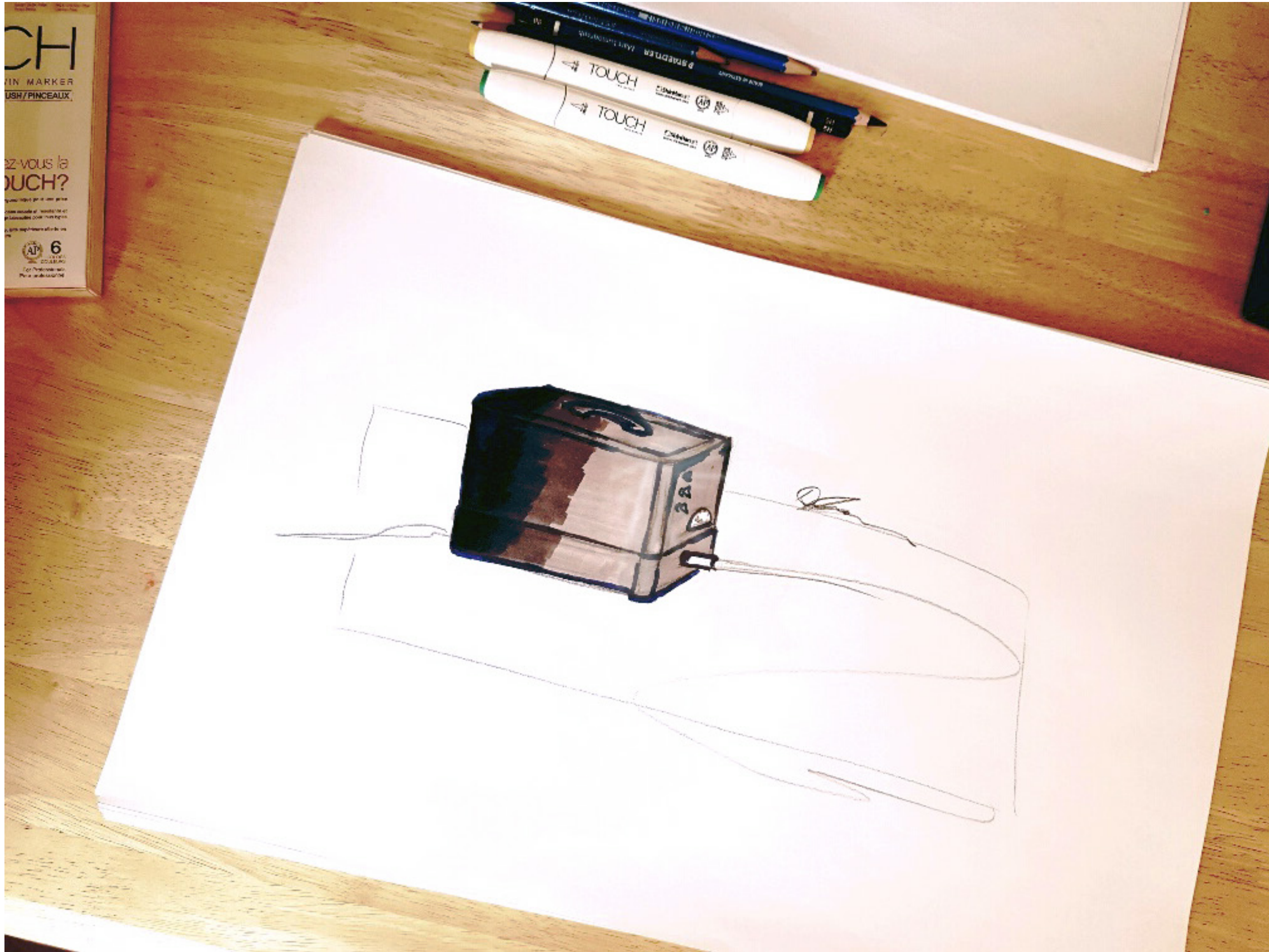
Project Drawings
Constantinos Papaconstantinou

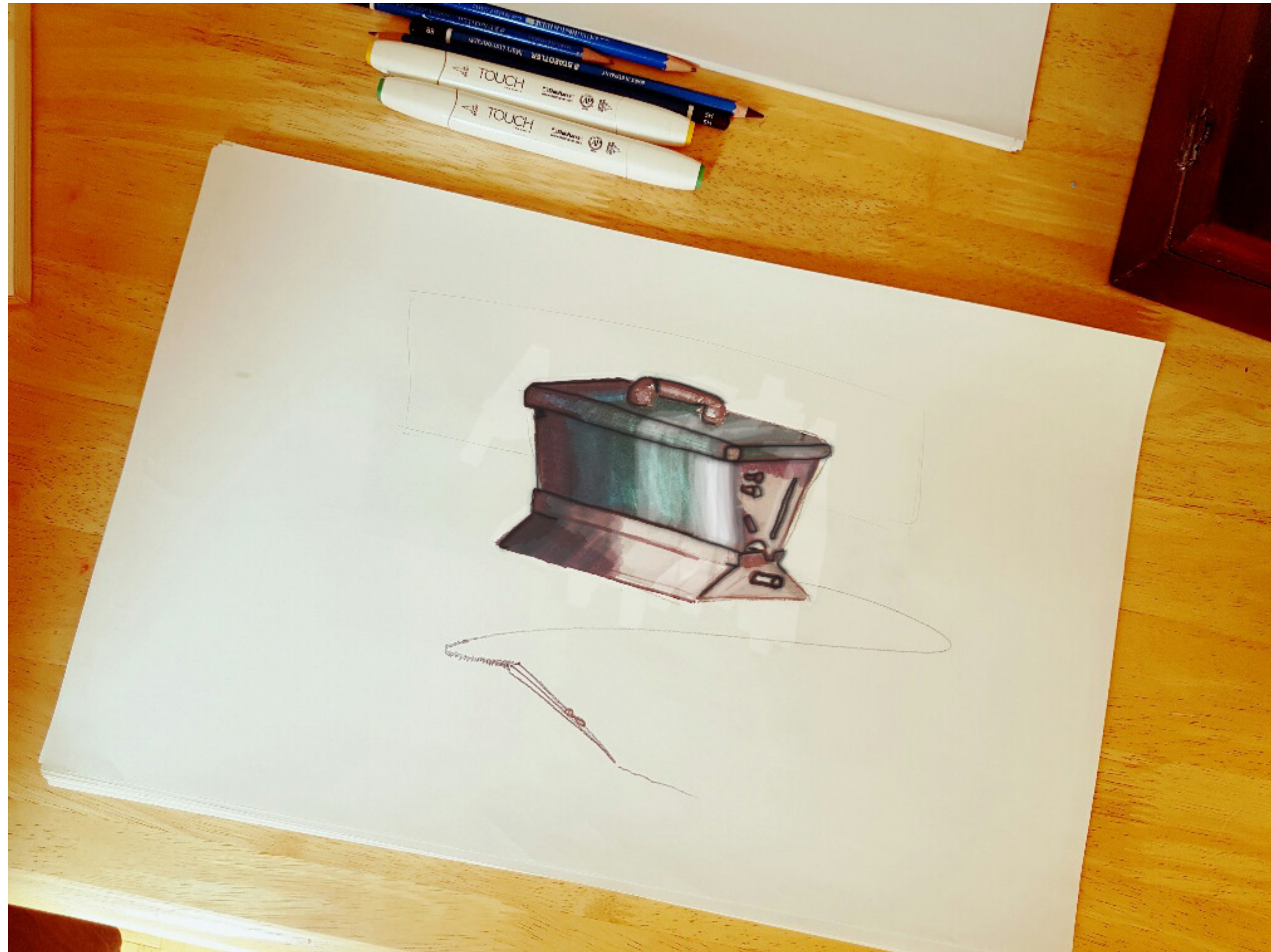


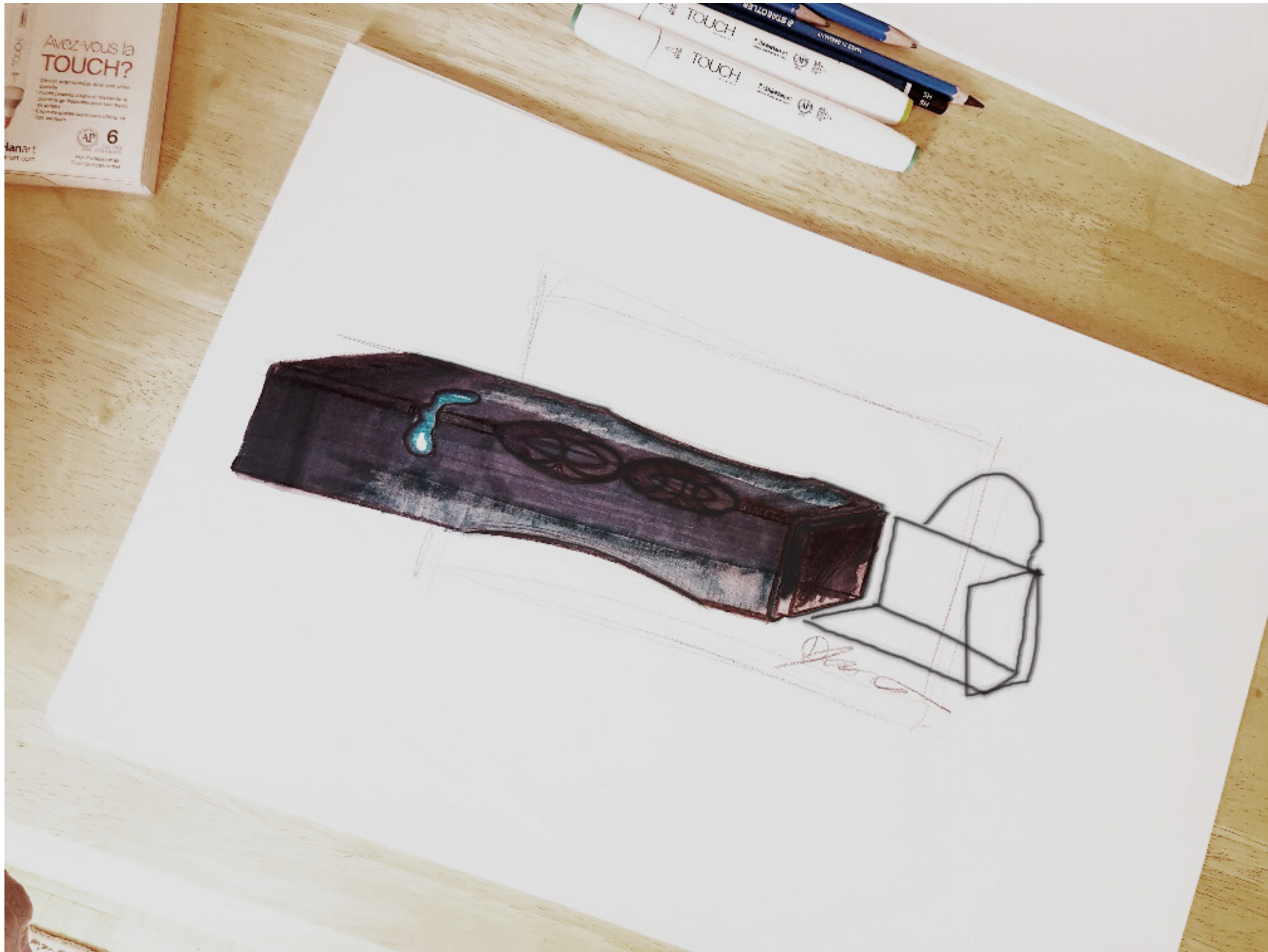


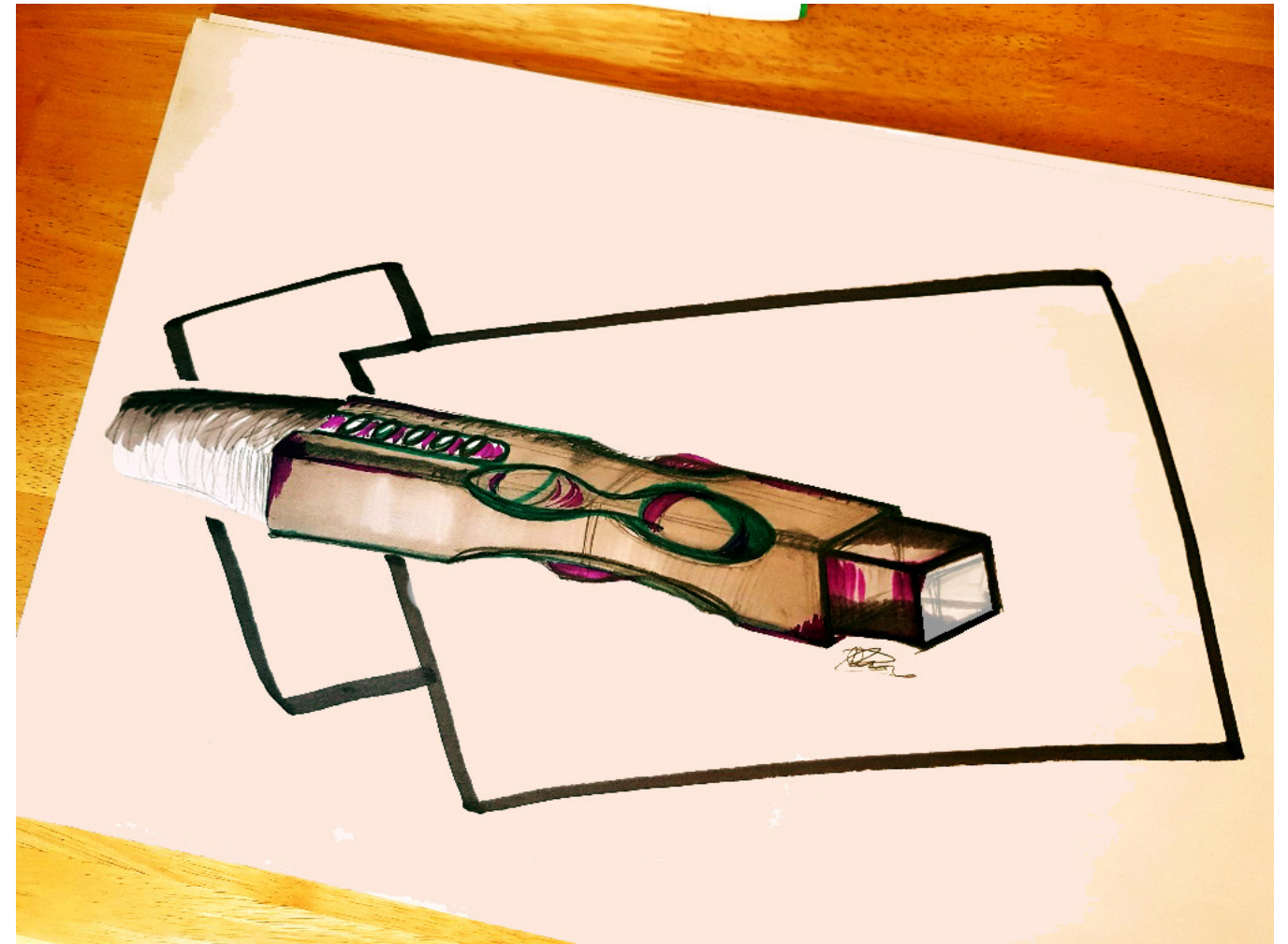
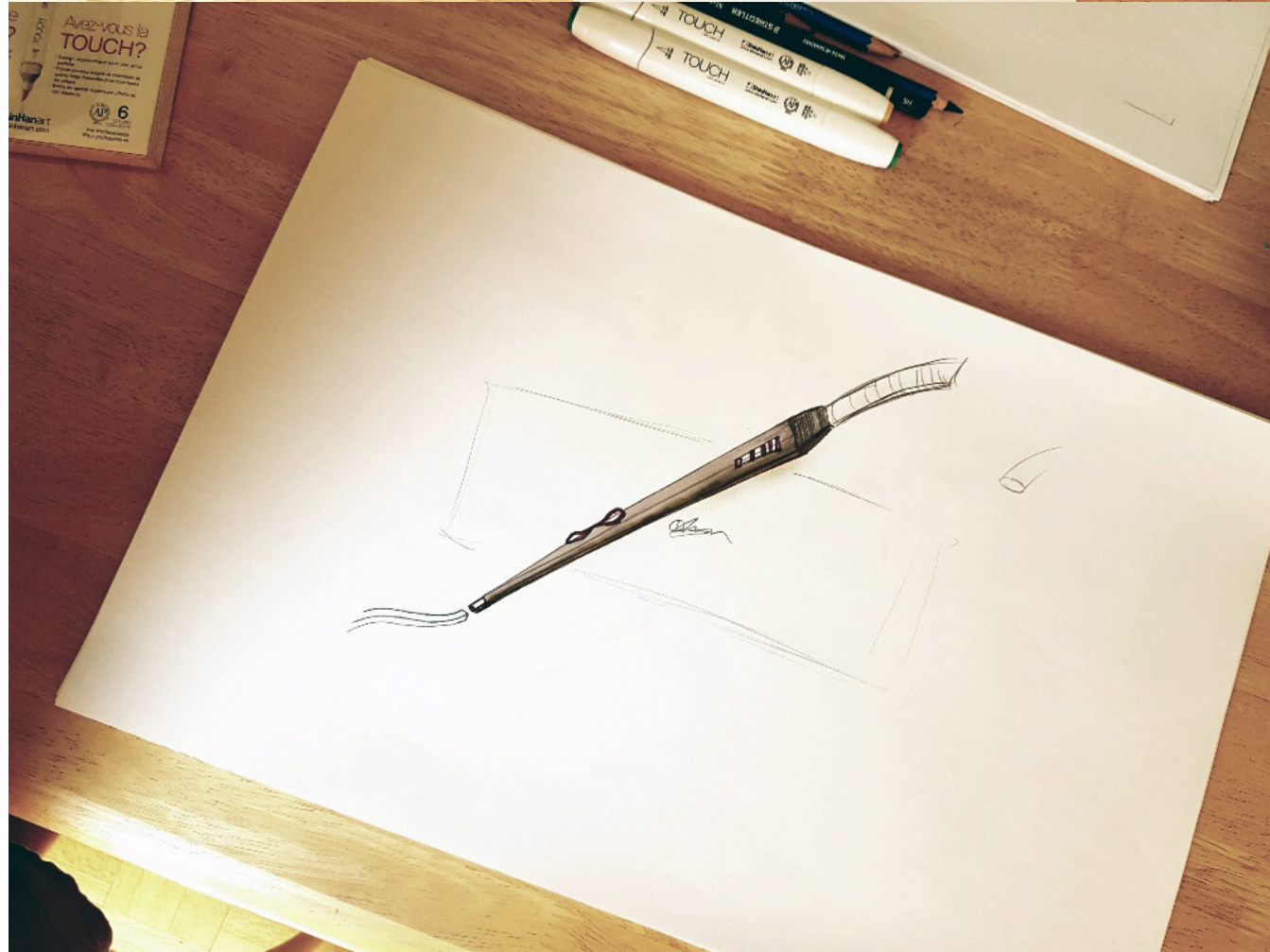
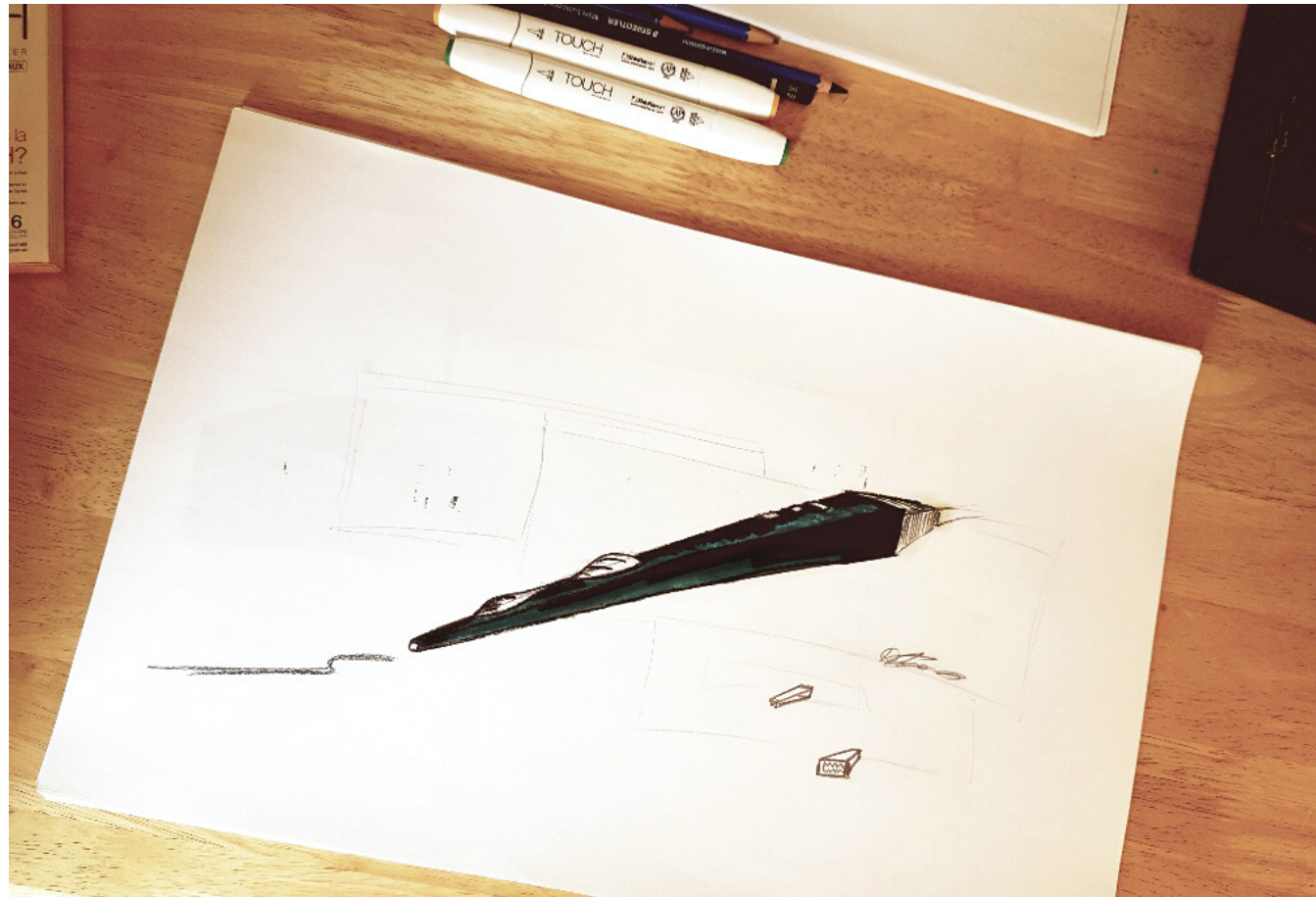
Project Drawings
Constantinos Papaconstantinou





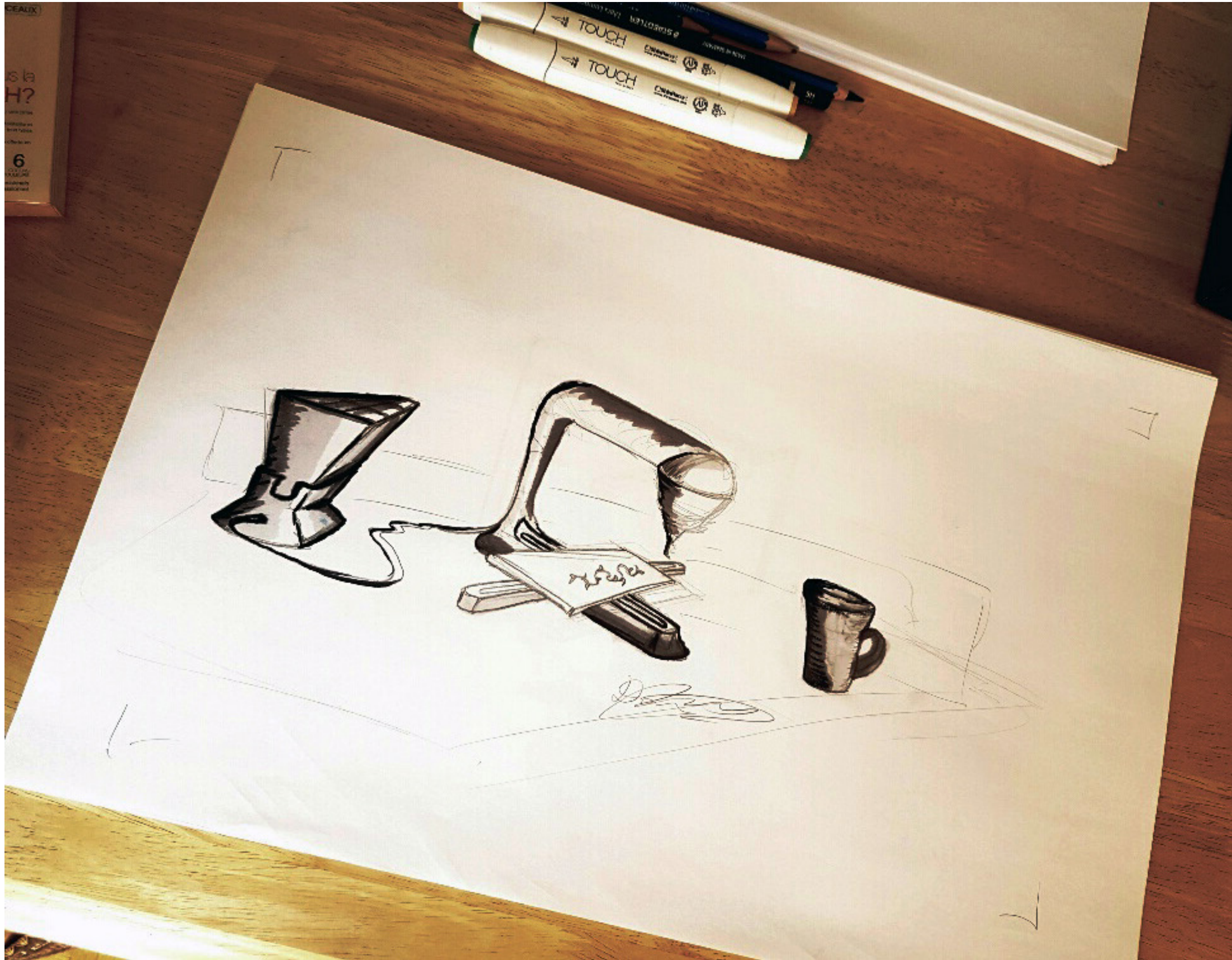


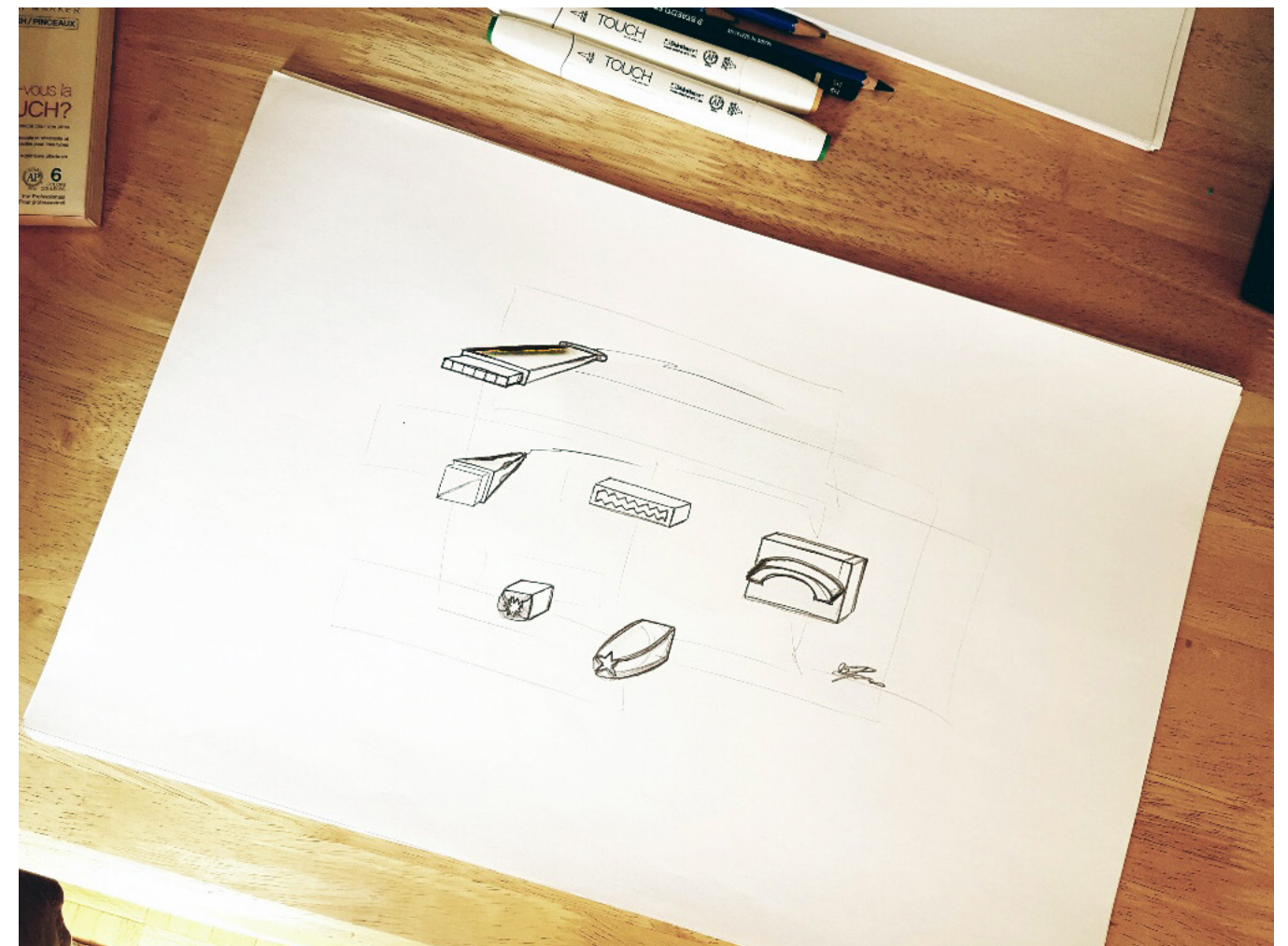
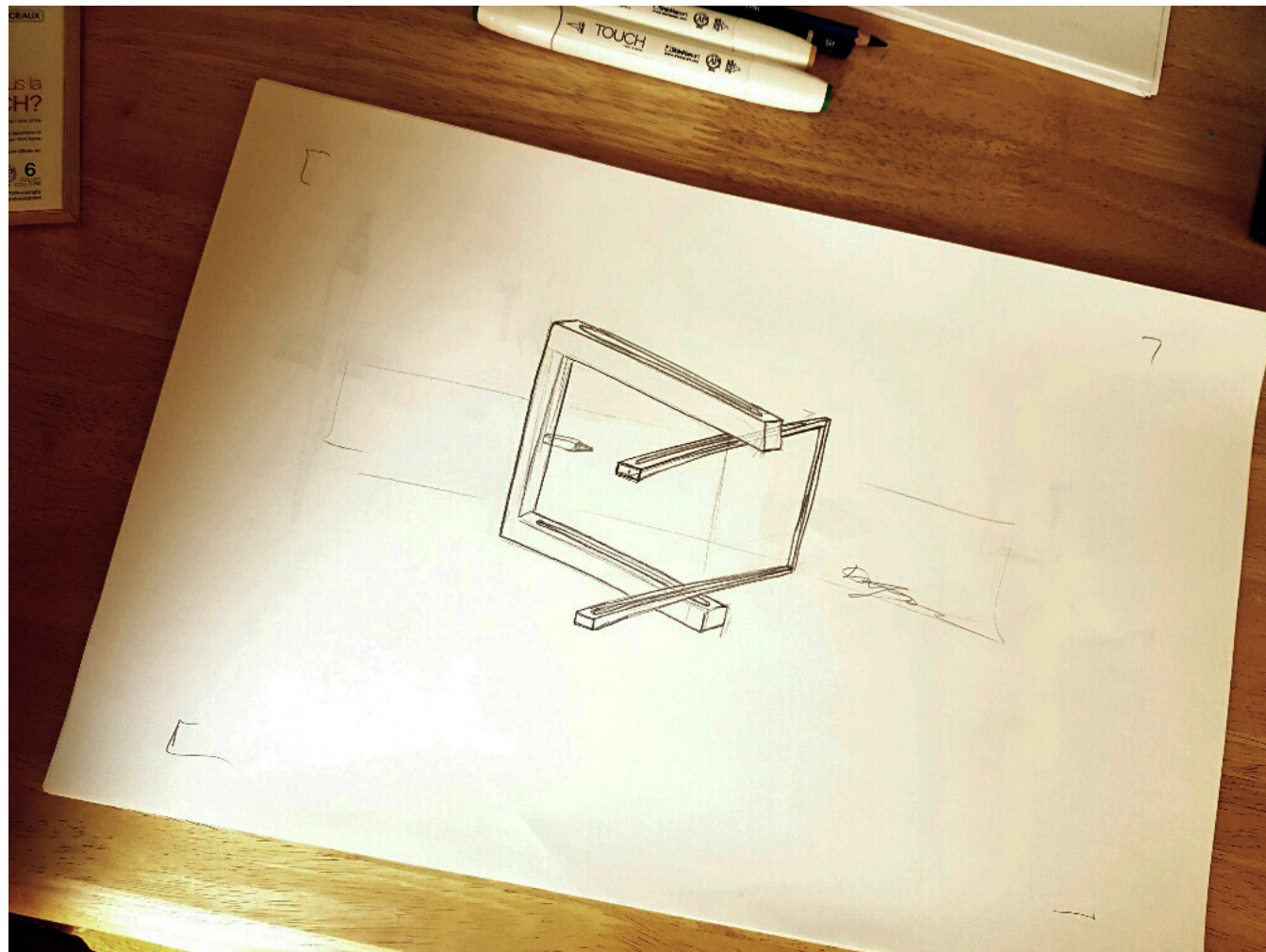




Project Drawings
Constantinos Papaconstantinou

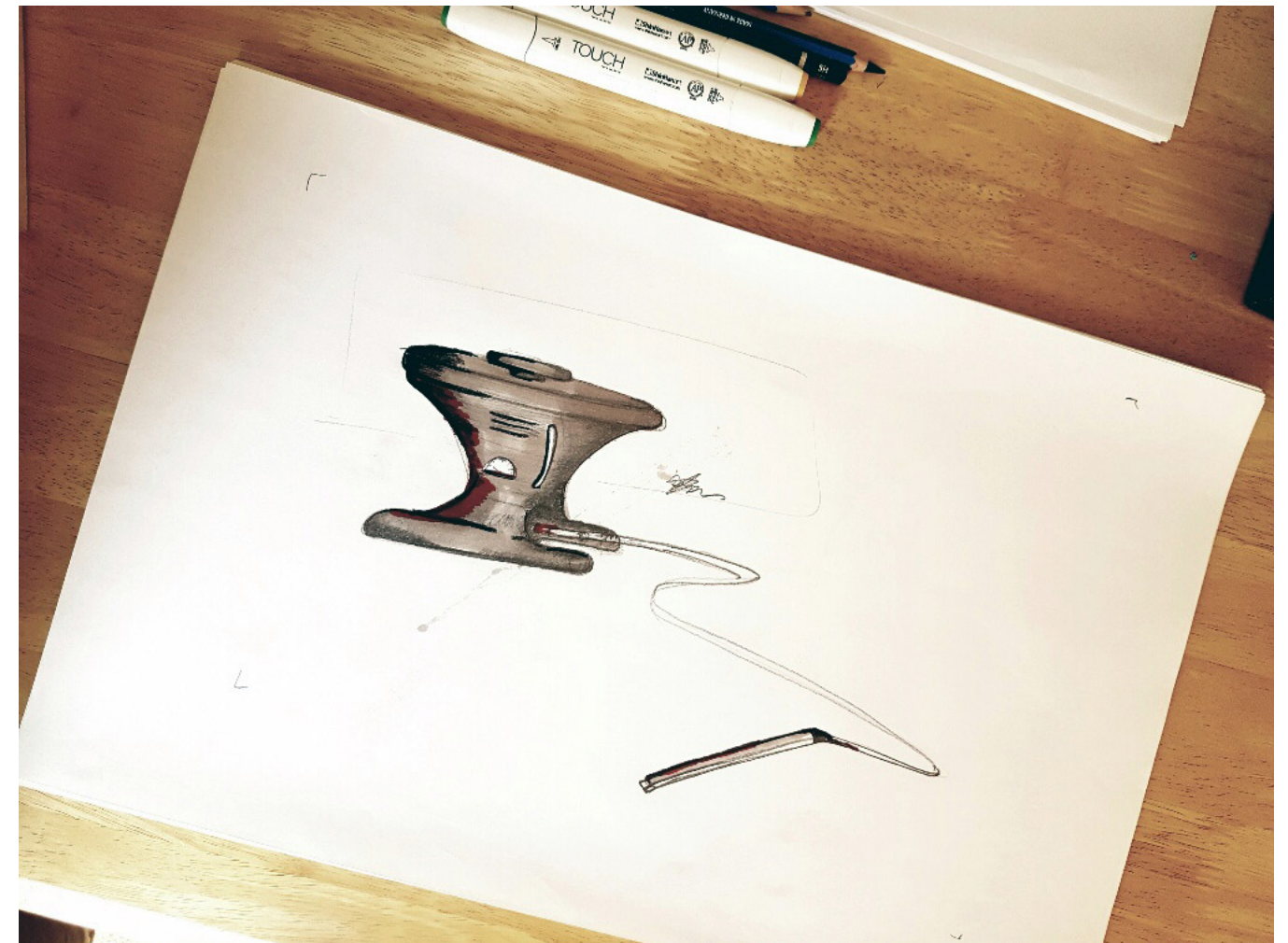
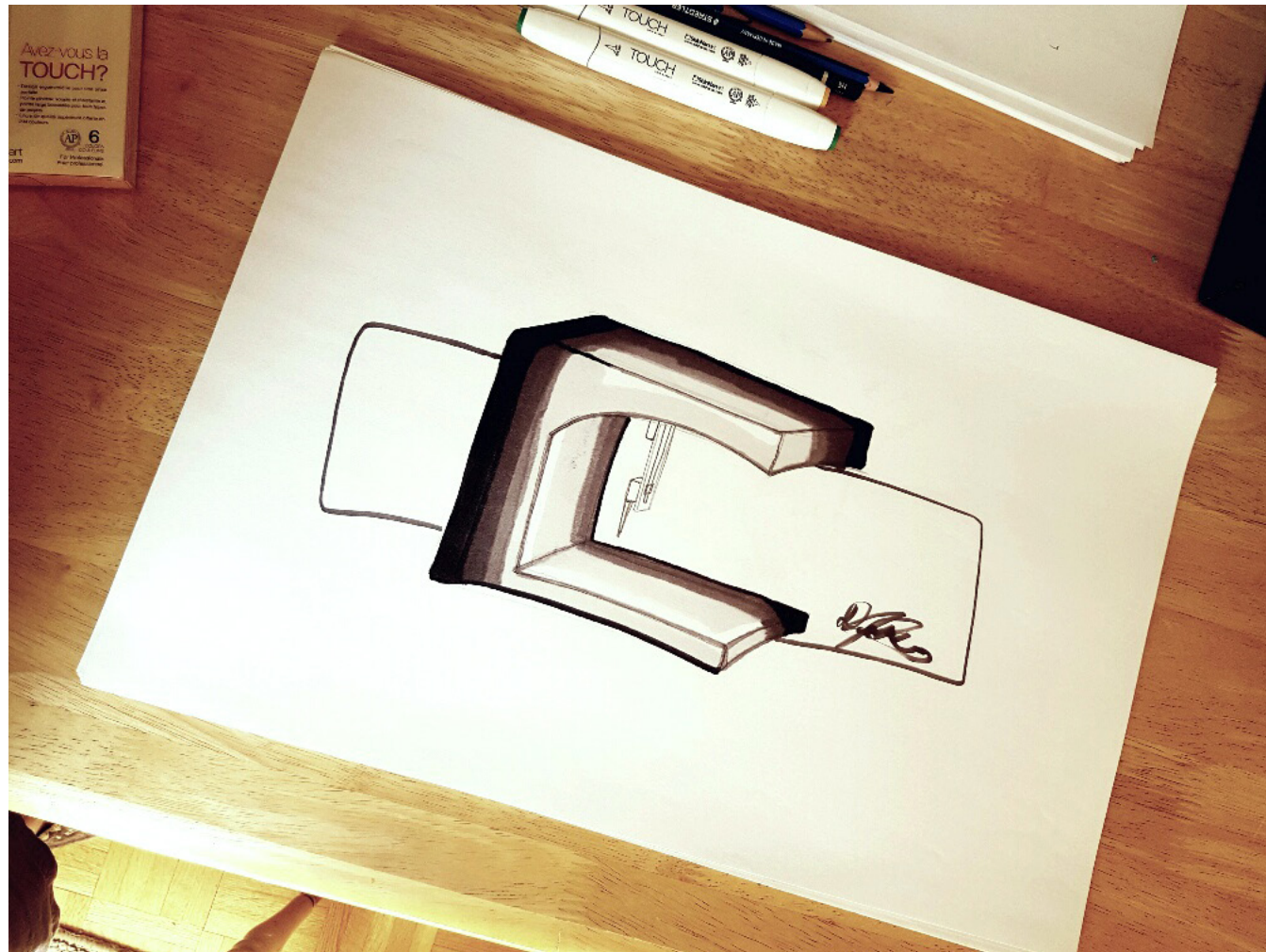






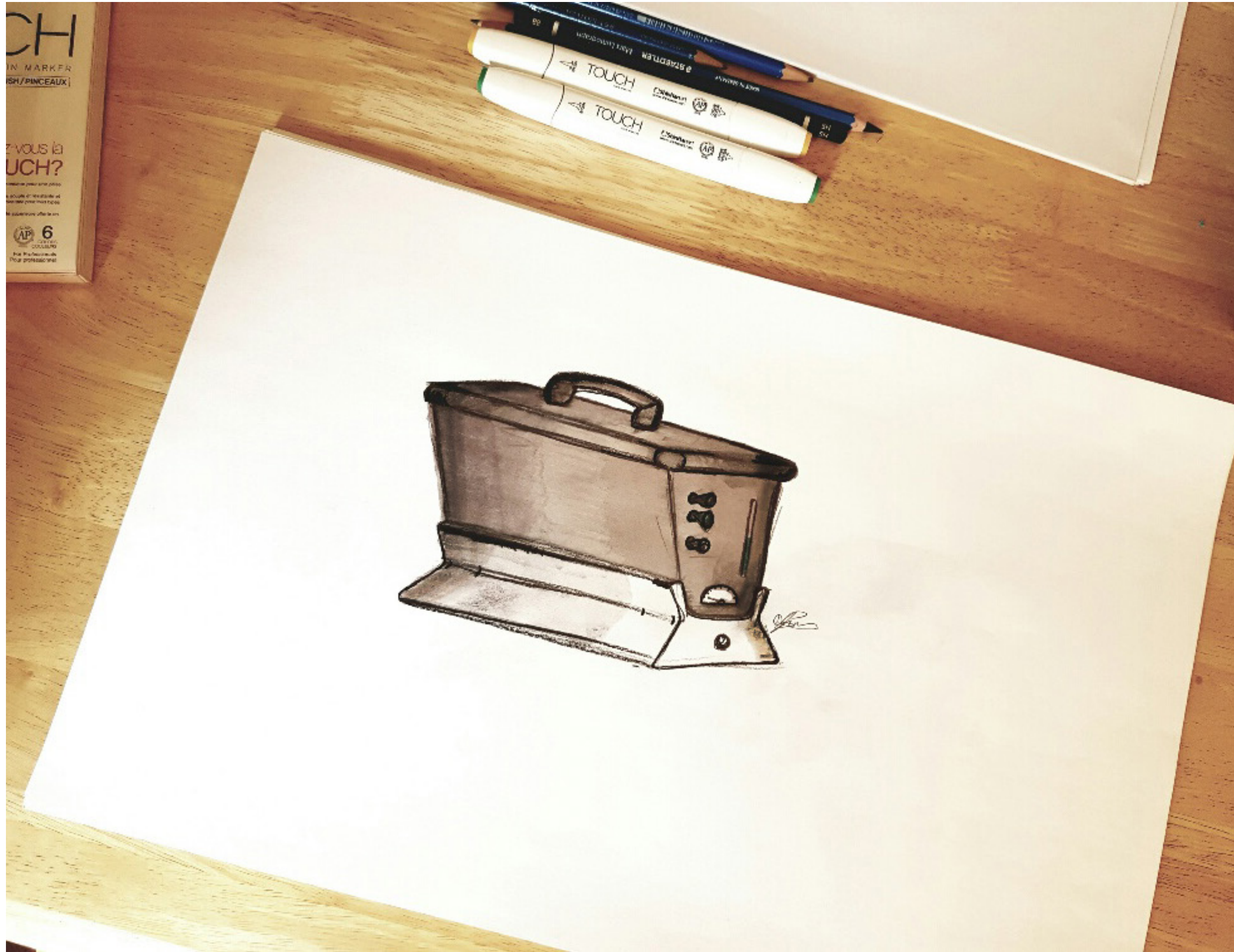
Project Drawings
Constantinos Papaconstantinou

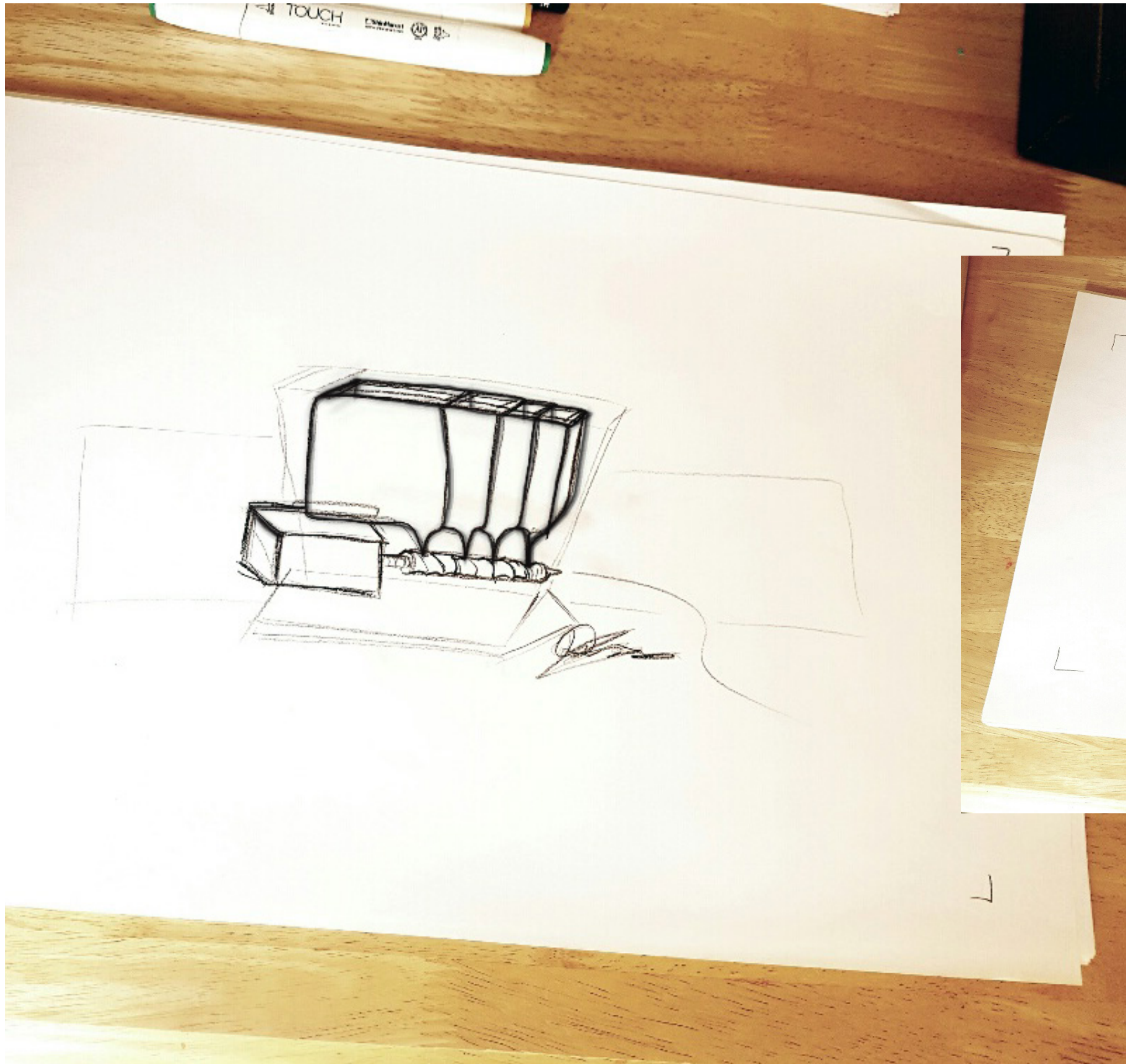


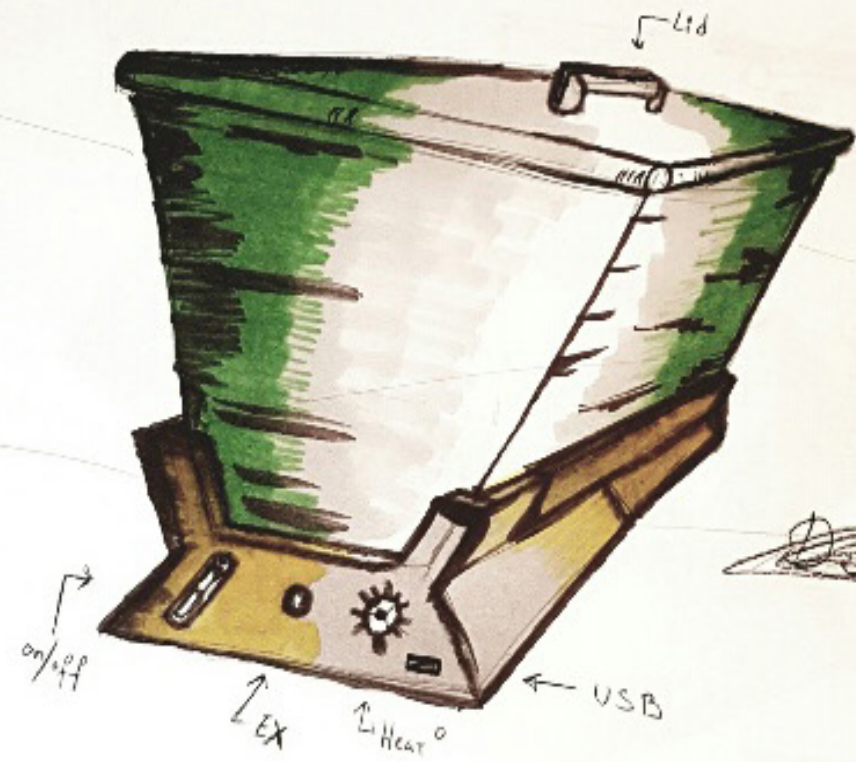


Project Drawings
Constantinos Papaconstantinou









Water Heater

Electrical Heater

Chocolate

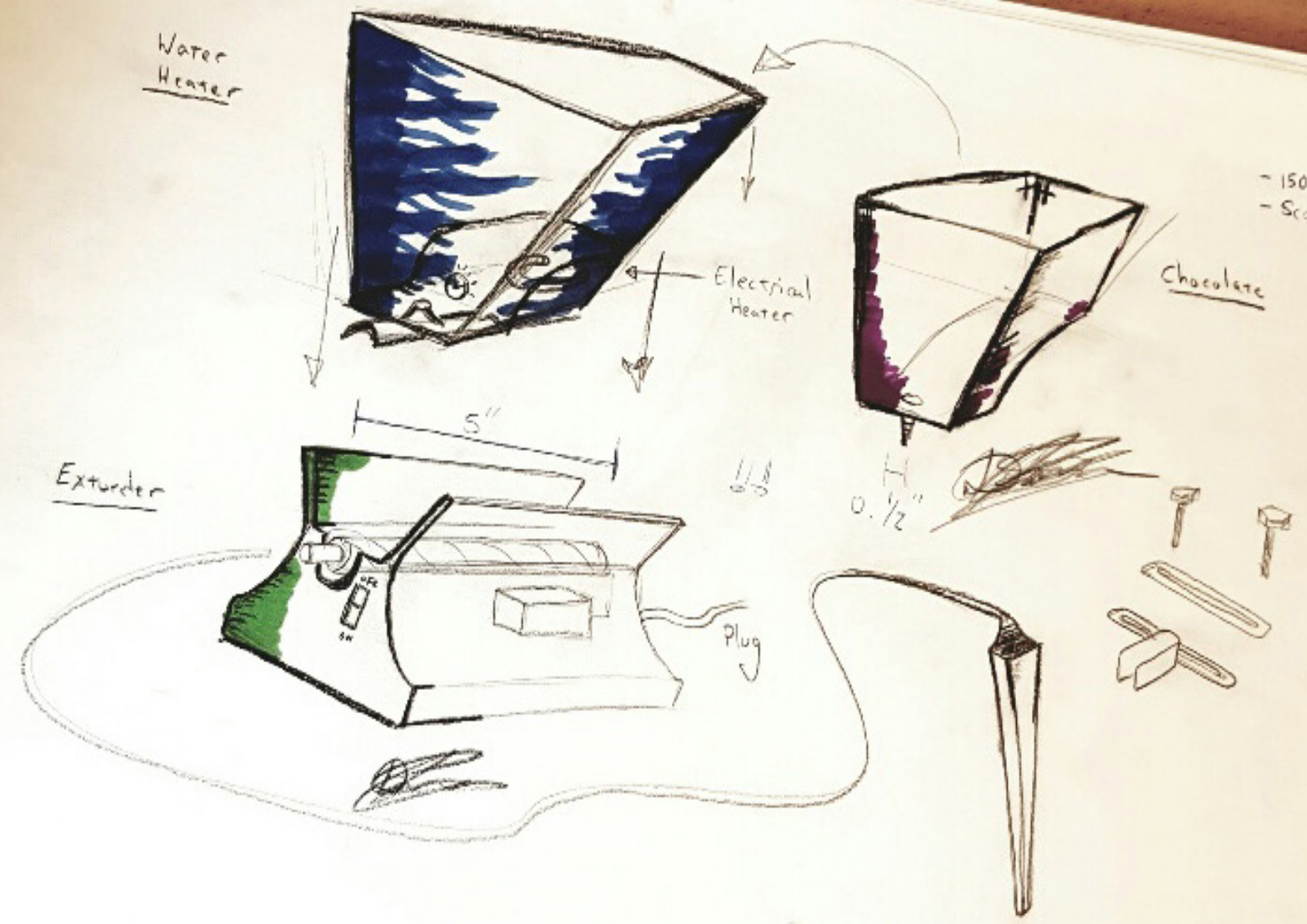
Extruder

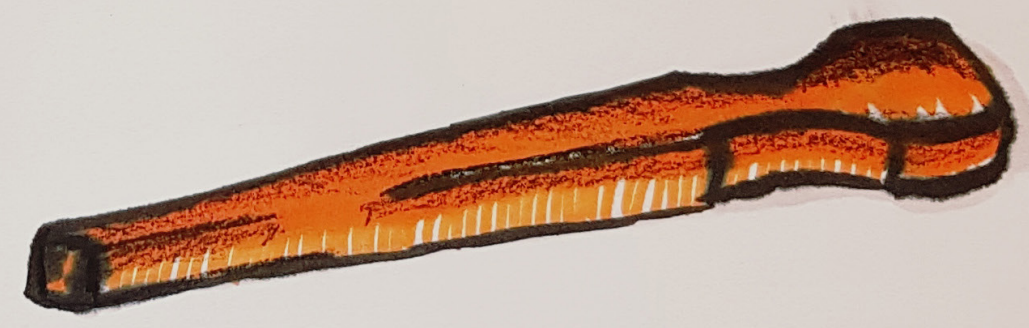
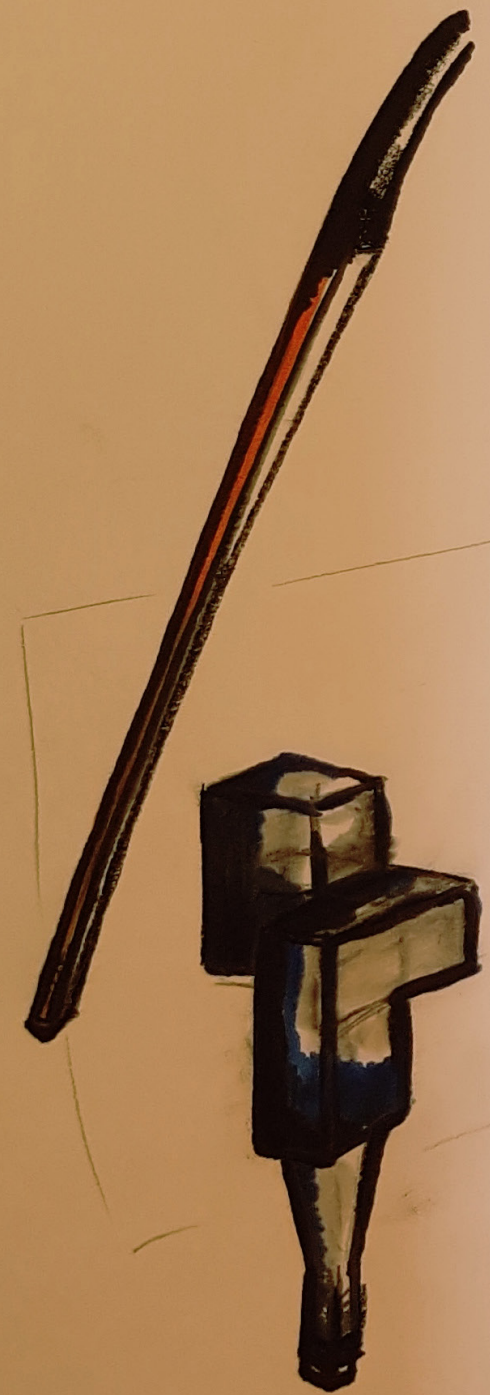
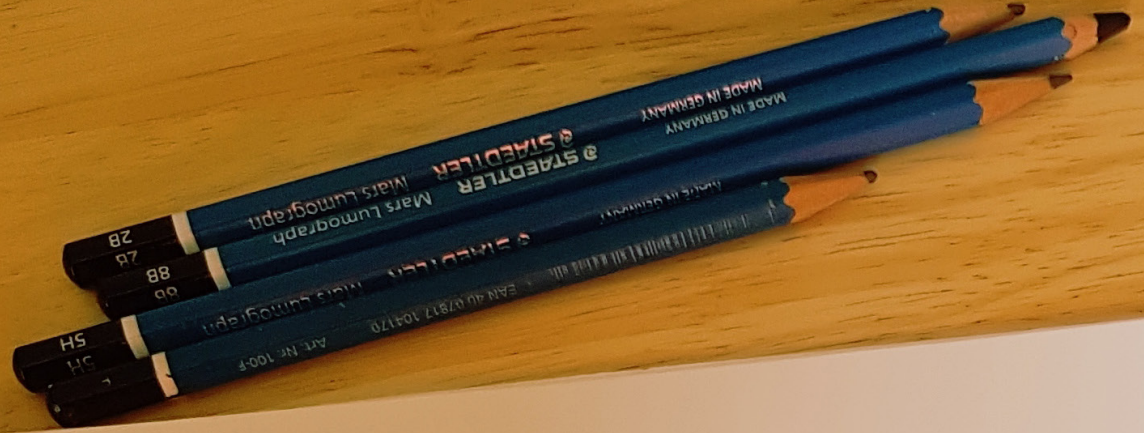
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0.1/2

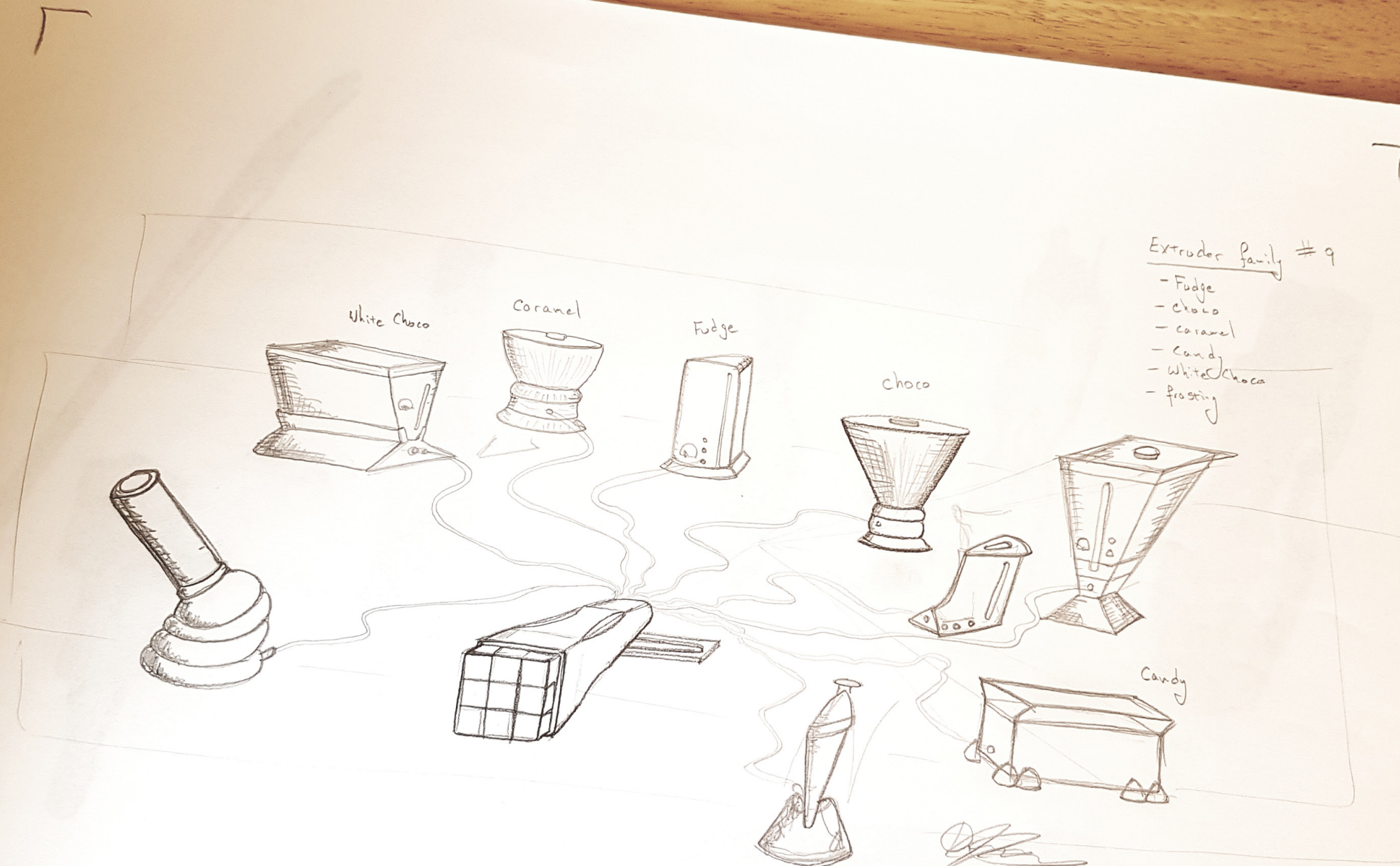
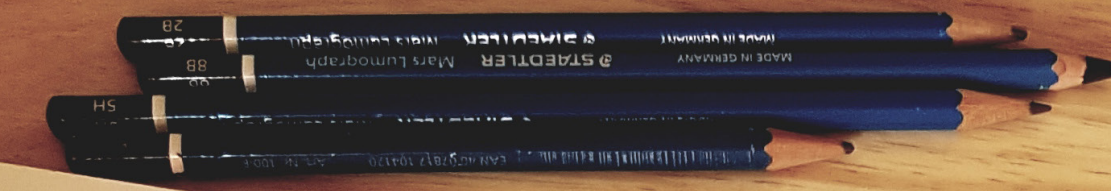
Plug

- 150°
- Screw pin FDM





[Handwritten signature]



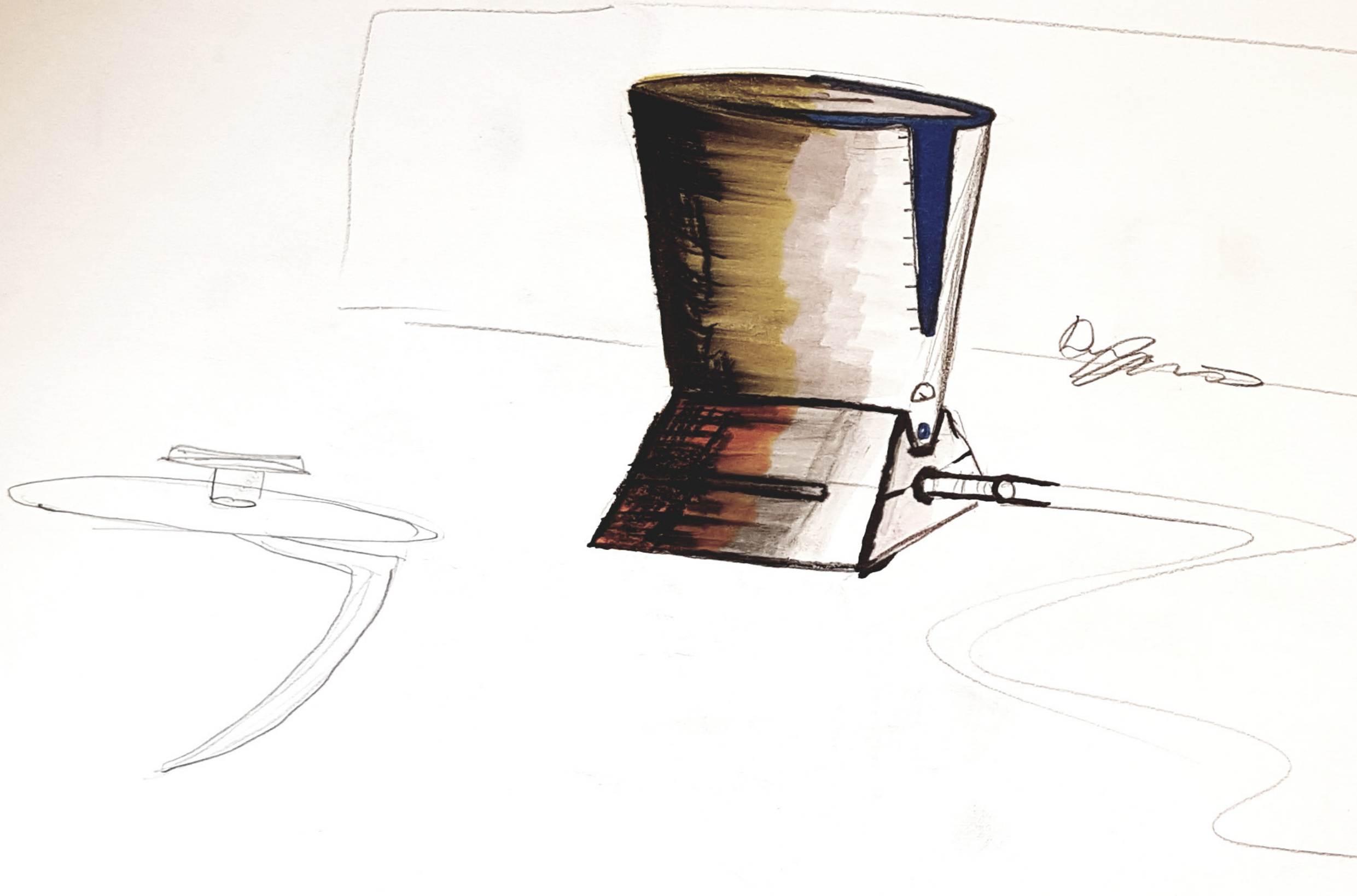
Extruder family # 9

- Fudge
- choco
- coramel
- candy
- white choco
- frosting

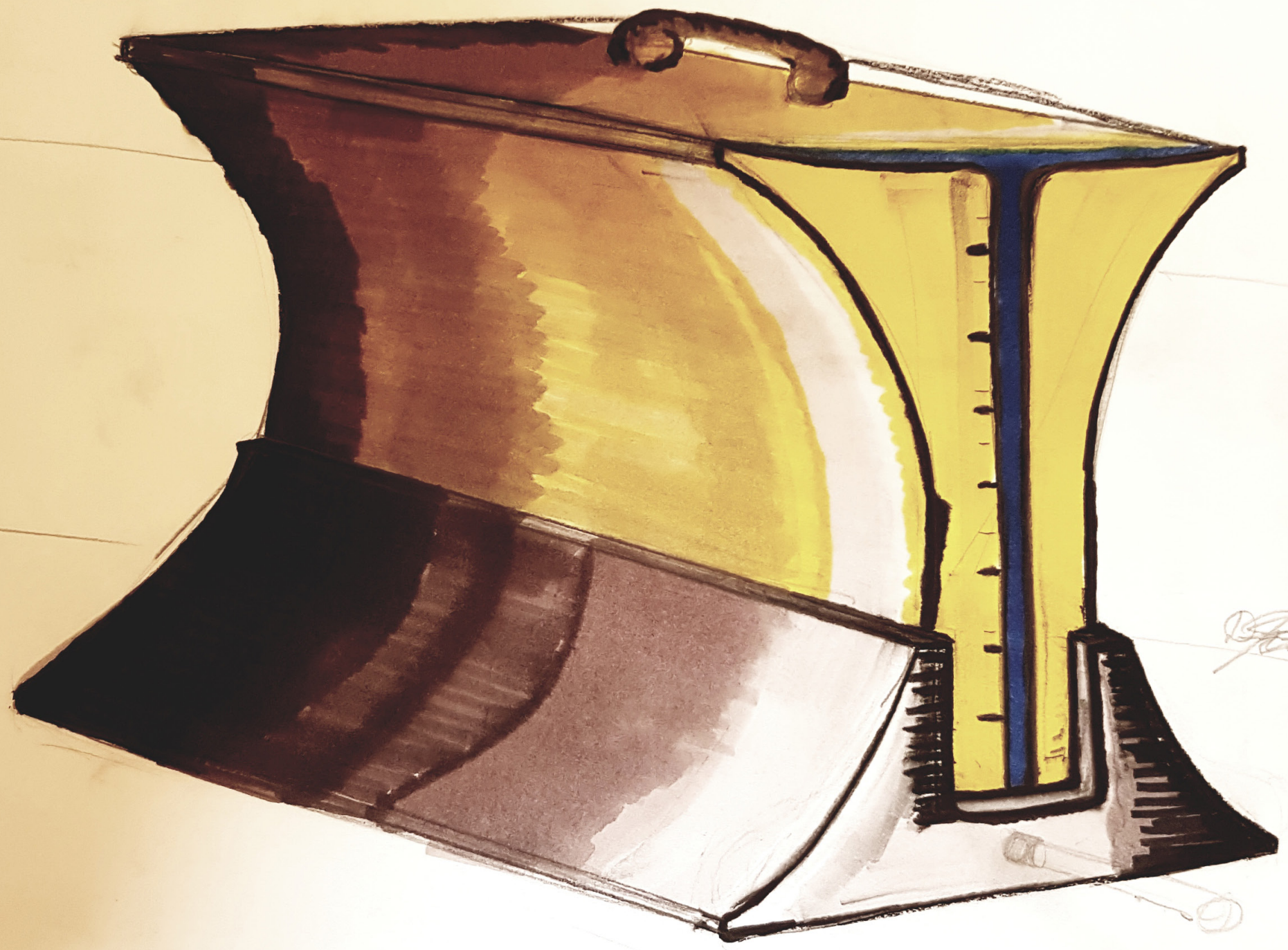
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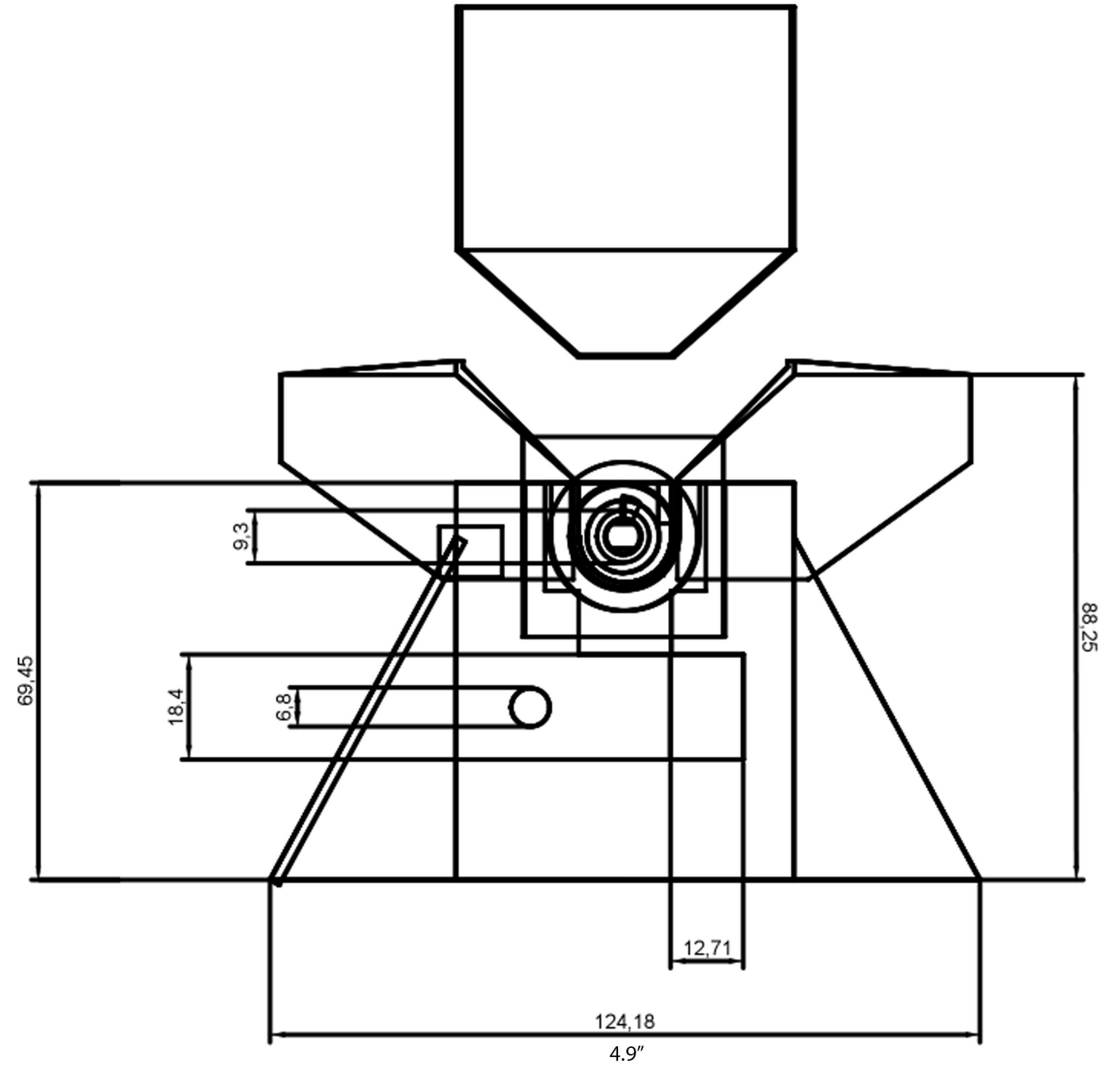
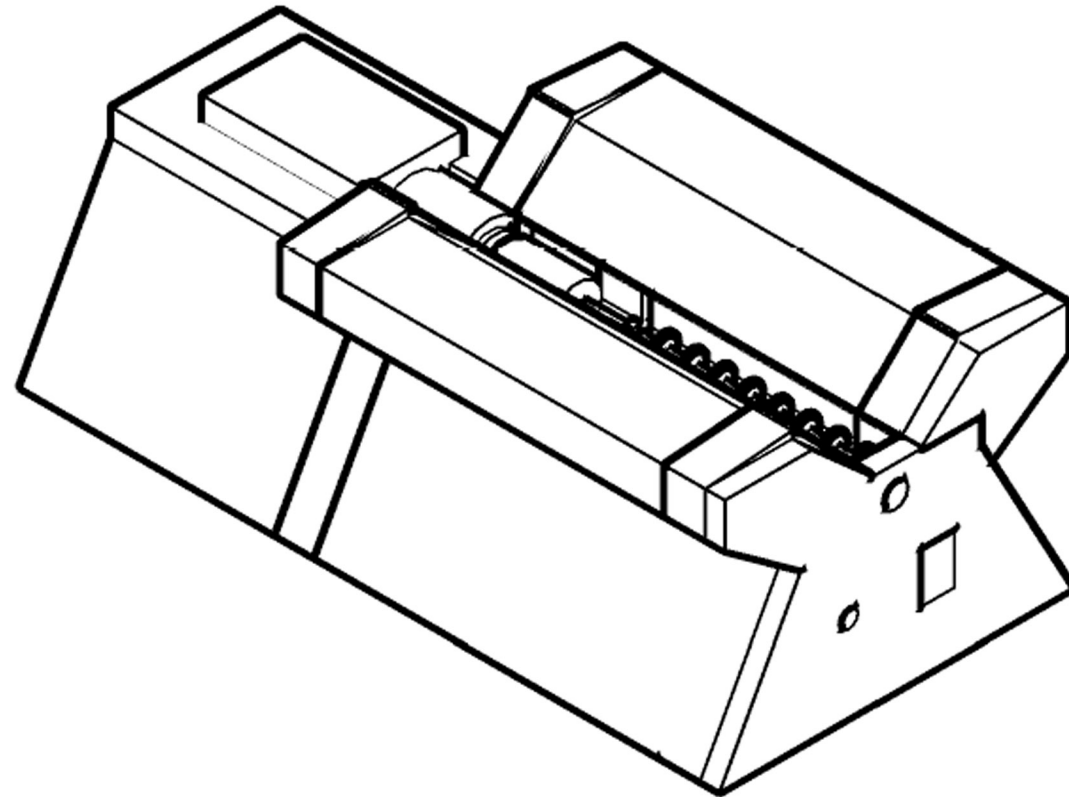
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MADE IN GERMANY
STREITLER
Wass. Lumogriff



Plan



Material	Amount and Dimensions
A Unidentified	X 1

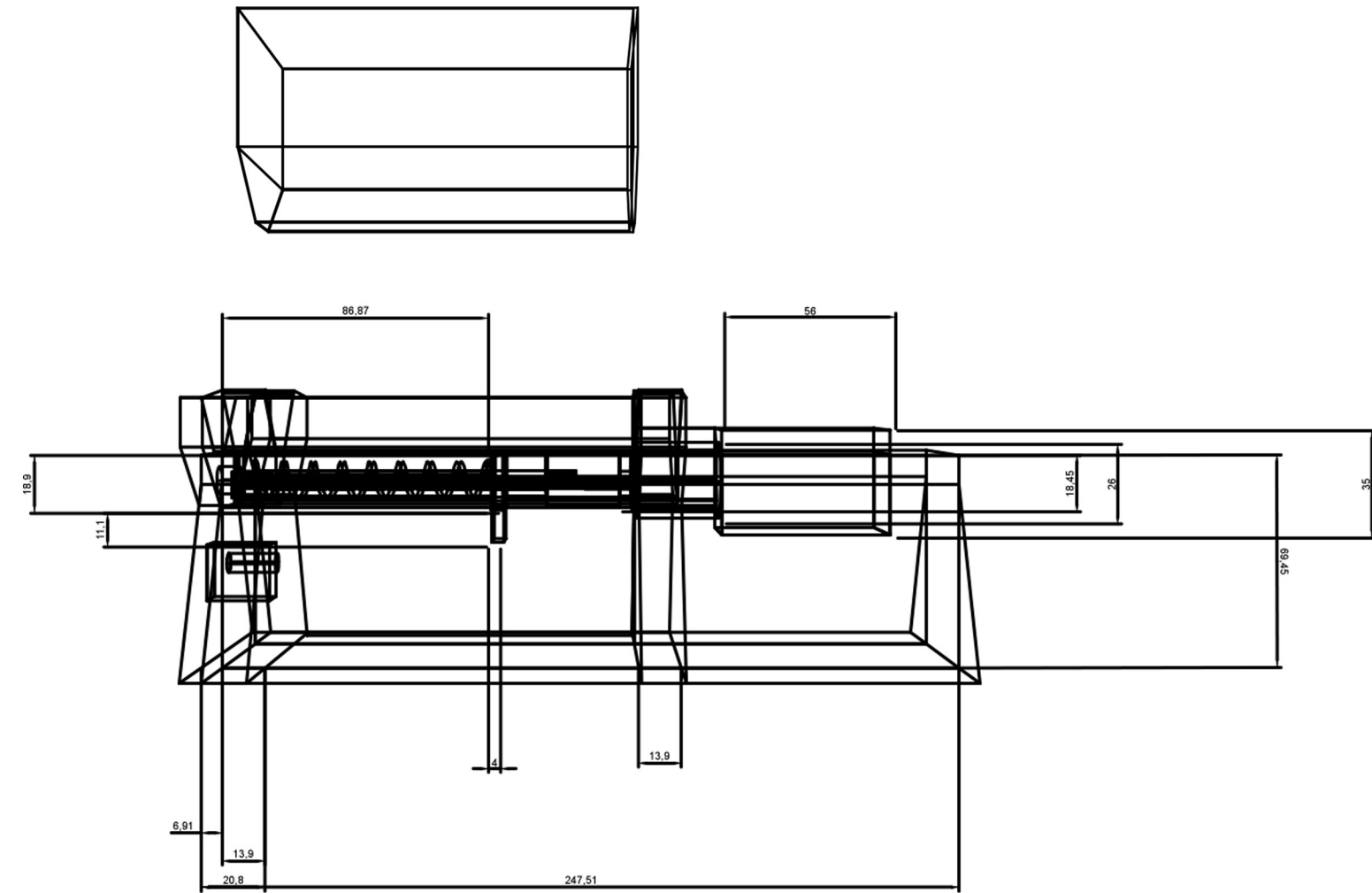
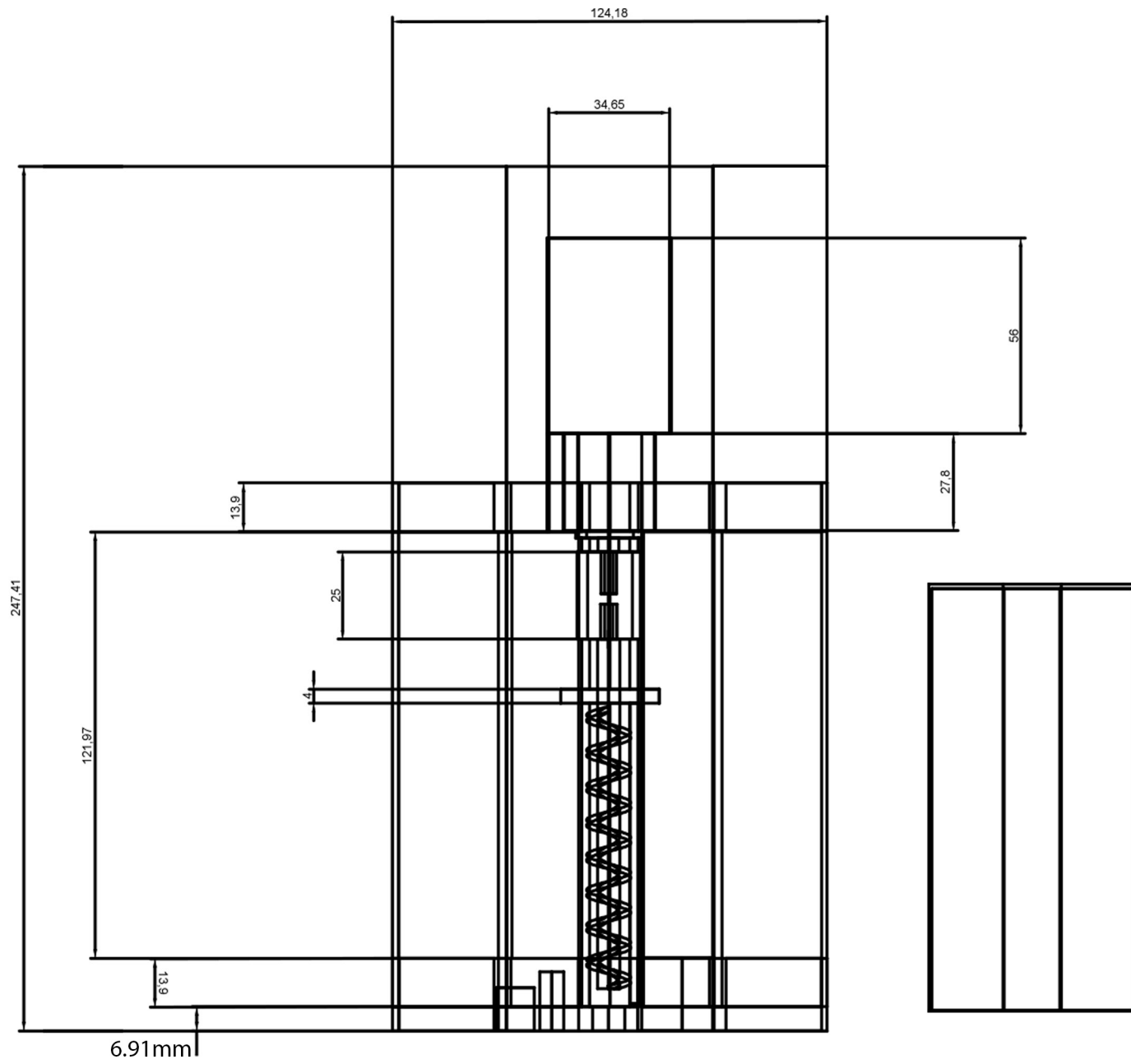
Industrial Designer: Constantinos Papaconstantinou
 Mechanical Engineer: Mohammad Razi
 Chocolate Extruder Design
 02 / 23 / 2015
 Unit: mm
 Scale: 1:2



Material	Amount and Dimensions
A Unidentified	X 1

Designer: Constantinos Papaconstantinou
 Engineer: Mohammad Razi
 Chocolate Extruder Design
 02 / 23 / 2015
 Unit: mm & inches
 Scale: 1 : 1





Material	Amount and Dimensions
A Unidentified	X 1

Designer: Constantinos Papaconstantinou
 Engineer: Mohammad Razi
 Chocolate Extruder Design
 02 / 23 / 2015
 Unit: mm
 Scale: 1/2



Material	Amount and Dimensions
A Unidentified	X 1

Designer: Constantinos Papaconstantinou
 Engineer: Mohammad Razi
 Chocolate Extruder Design
 02 / 23 / 2015
 Unit: mm
 Scale: 1:2



