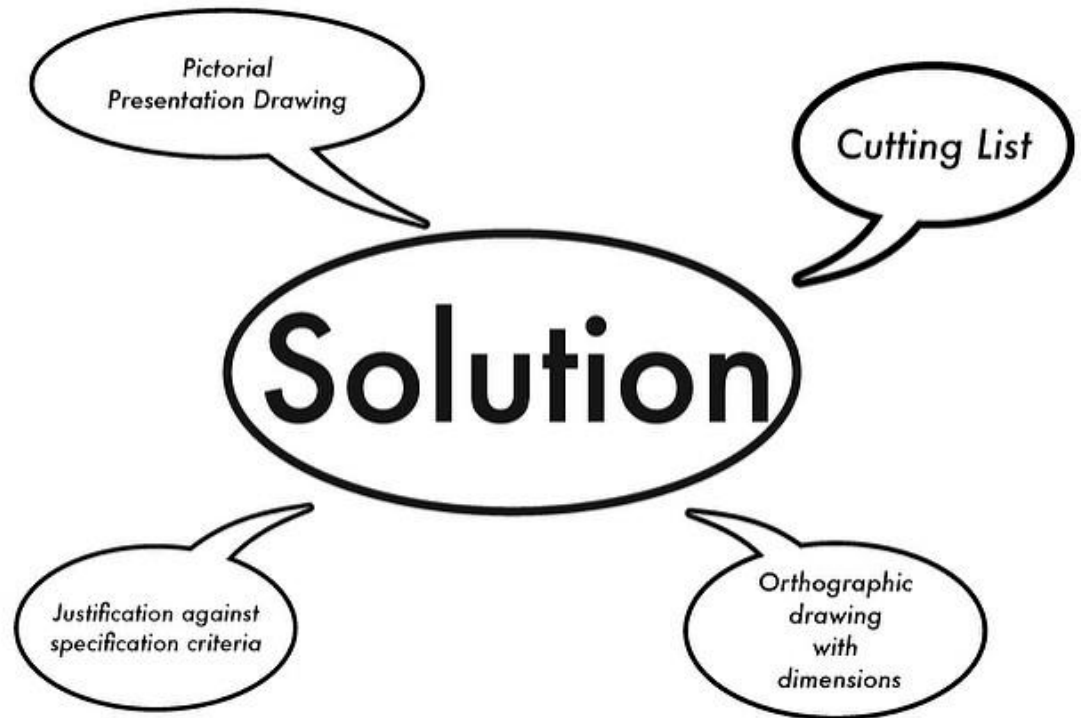
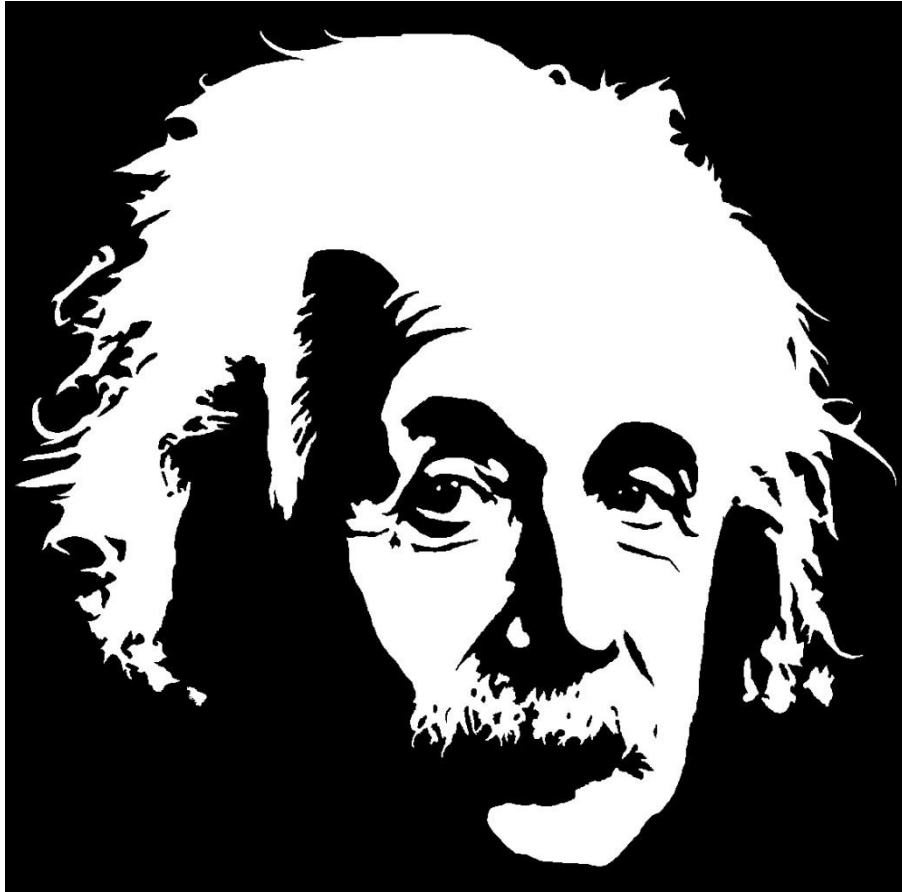


# Design Ideation

- Explore the space of possible design solutions



“You can’t solve a problem with the same thinking that created it”.



There are  
some mental  
blocks during  
design  
ideation  
process

# Conventional Ideation: mental blocks

- **Design fixation**

the tendency of a designer to favor a design from previous experience, a design seen or developed by the designer.

- **Premature judgment**

force designers to discard early design ideas that do not evaluate well.

- **A tight grip on problem specifications**

tendency to impose fictitious constraints

# Unconventional Thinking in Engineering Design (UnTiED) ideation

- Design ideas by seeking random connections with unusual combinations between un-related concepts?
- Absurdity (pattern breaking thinking) has any role in ideation? How to direct absurd ideas on the right track to discovering new ideas?
- How about tinkering with design ideas which are nonjudgmental and open ended?
- How to come up with fun product ideas by challenging assumptions with reverse thinking?

# Absurdity: What comes to your mind when you think of a chair?



**UnTiED Ideation**

[betterlivingthroughdesign.com/](http://betterlivingthroughdesign.com/)

# What comes to your mind when you think of a building?



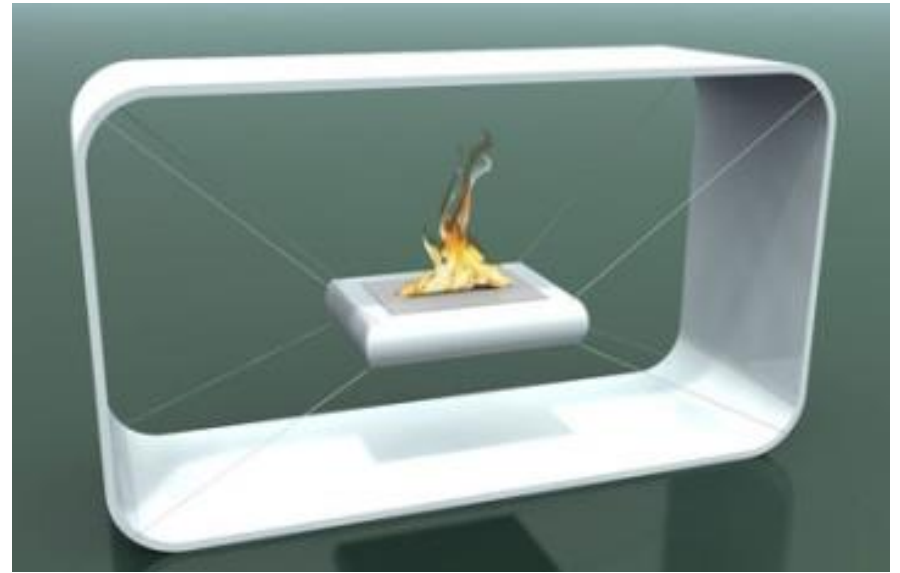
**Tinkering with design ideas which are  
nonjudgmental and open ended**



**UnTiED Ideation**

Stata Center MIT, Massachusetts

# Why does a fire place is designed to look like the way it is?



**UnTiED Ideation**

**Fun product ideas by challenging assumptions  
with reverse thinking**

# Why does an umbrella is designed to look like the way it is?



UnTiED Ideation



Fun product ideas by challenging assumptions  
with reverse thinking



# Elements of UnTiED ideation

1. Design ideas by seeking random connections with unusual combinations between un-related concepts



2. Absurdity (pattern breaking thinking) and direct absurd ideas on the right track to discovering new ideas



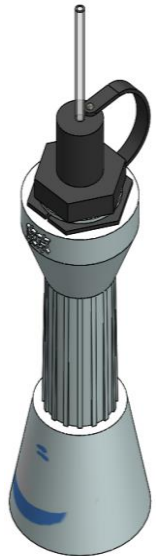
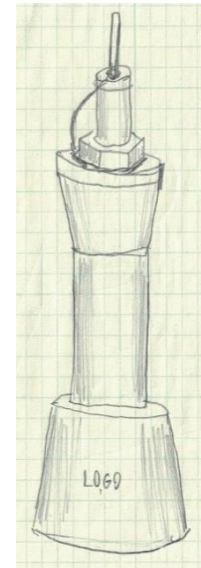
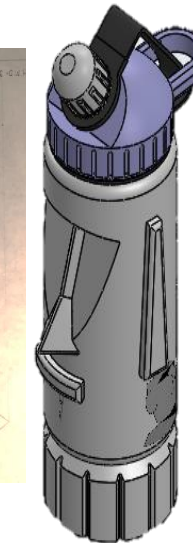
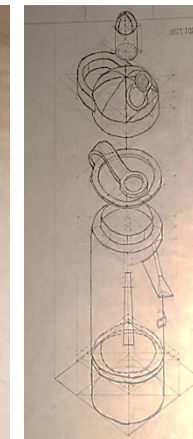
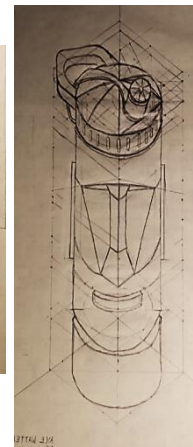
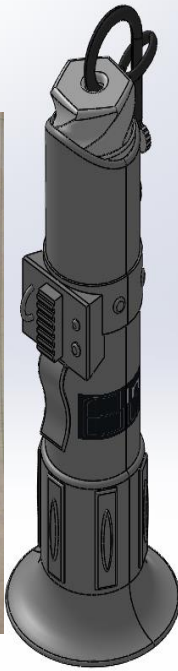
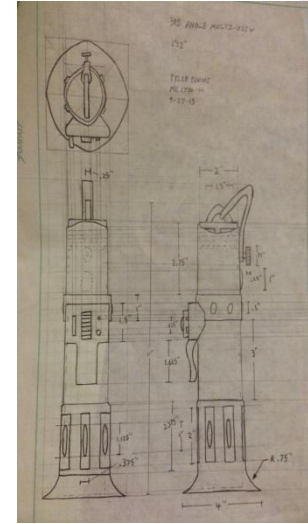
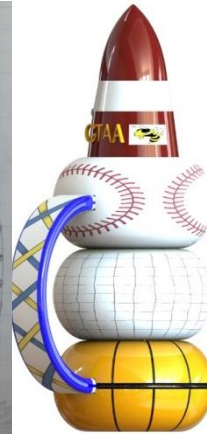
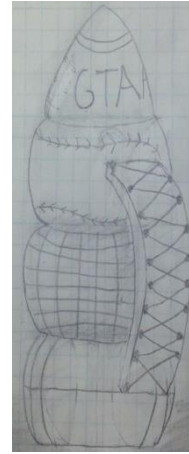
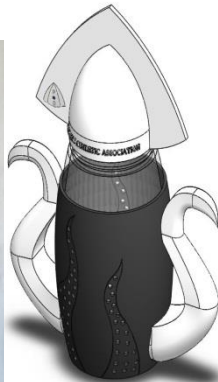
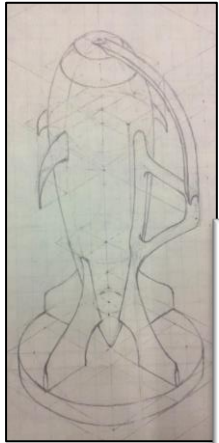
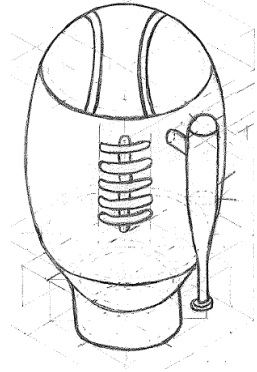
3. Tinkering with design ideas which are nonjudgmental and open ended



4. Challenging assumptions with reverse thinking

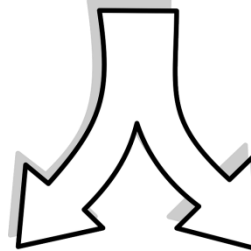


# Design Project 2, Consumer Products: Sketch, 3D Modeling and Assembly, and 3D Print



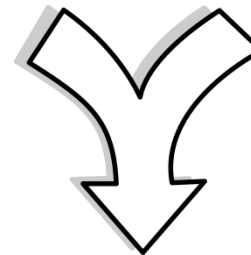
# Design Thinking

- Design thinking skills include an iterative loop of divergent (creative) and convergent (critical) thinking



## **Divergent Thinking**

- Exploratory
- Nonjudgmental
- Imaginative
- “what if?”
- Divergent and playful



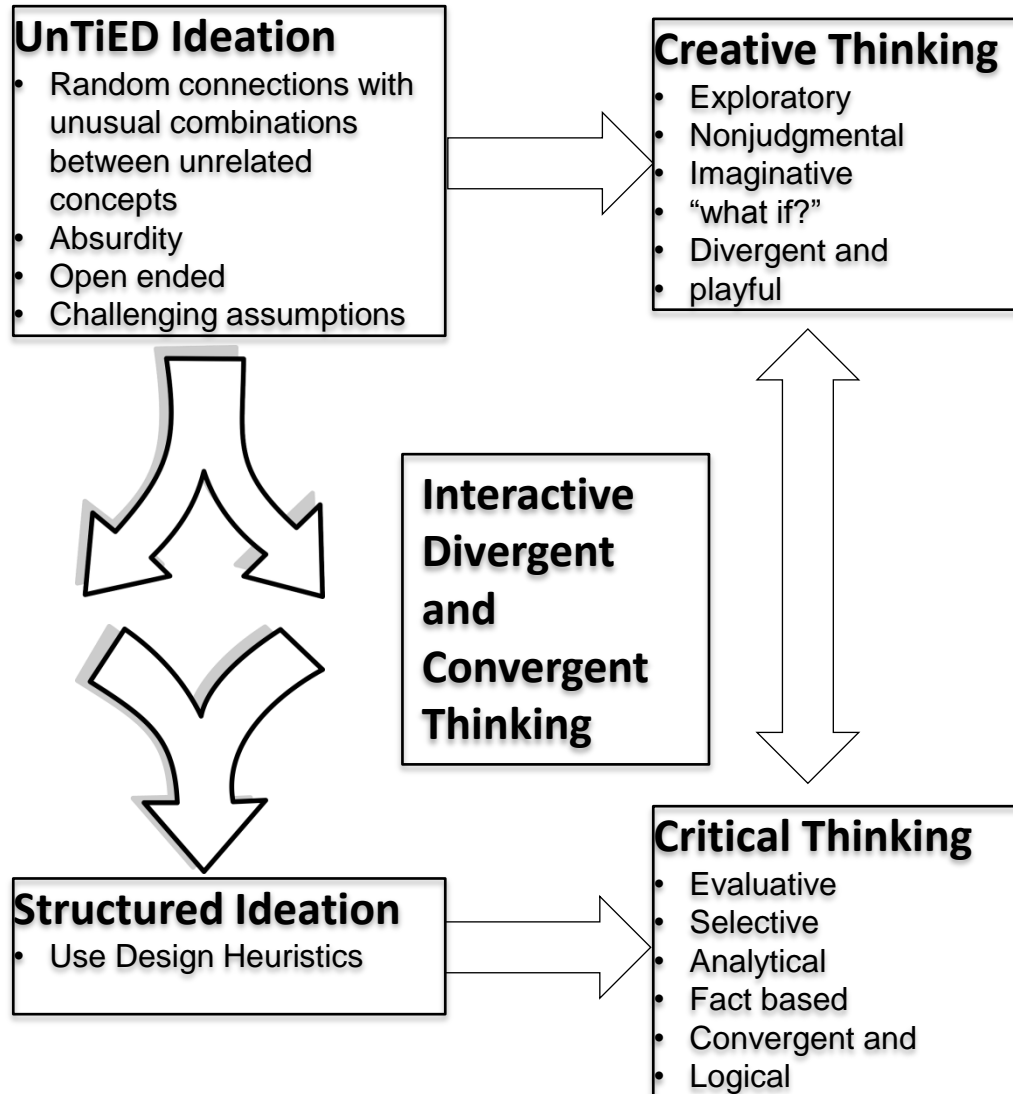
## **Convergent Thinking**

- Evaluative
- Selective
- Analytical
- Fact based
- Convergent and Logical

# Design Heuristics Cards for Convergent Thinking

- Help in design space exploration and speed up the process of finding a satisfactory solution.
- <https://www.designheuristics.com/>

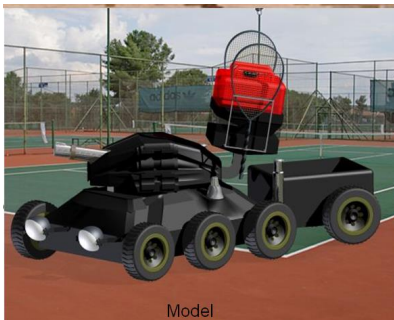
# Role of critical and creative thinking in conceptual design





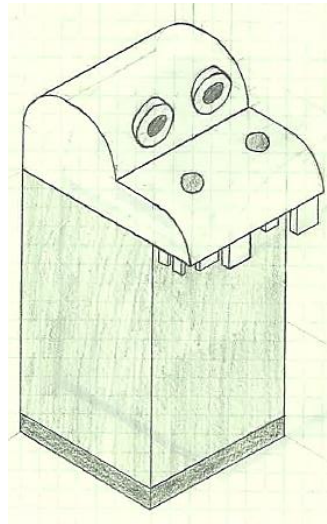
# UnTiED ideation + Design Heuristics : Some Examples

1. Design ideas by seeking random connections with unusual combinations between un-related concepts



**Tennis ball dispenser**

2. Absurdity (pattern breaking thinking) and direct absurd ideas on the right track to discovering new ideas



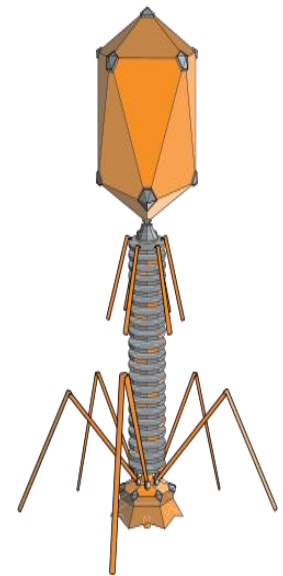
**Trash Can**

3. Tinkering with many design ideas which are nonjudgmental and open ended



**Beverage Mug**

4. Challenging assumptions with reverse thinking

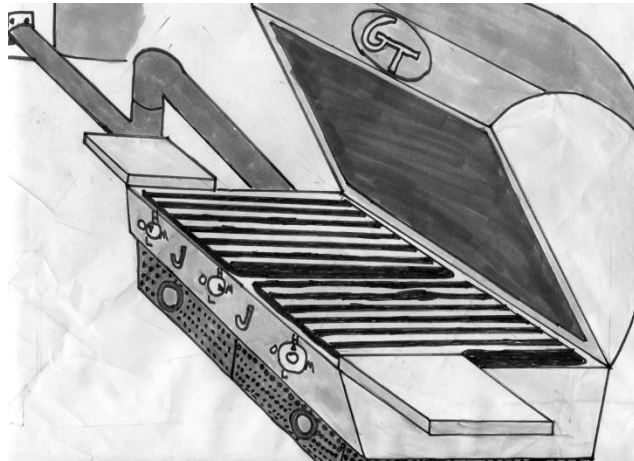


**Under water drill**

# UnTiED ideation + Design Heuristics : More Examples



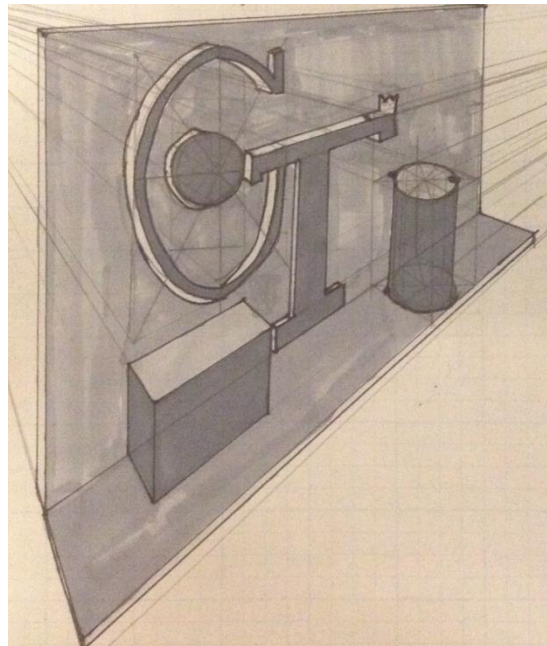
Tape Dispenser



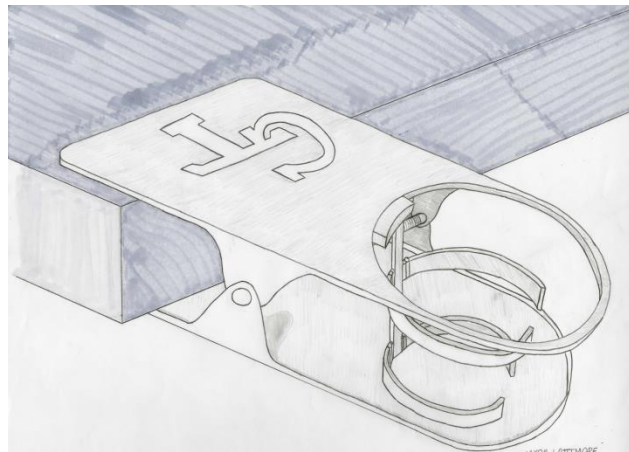
Grill with Speakers



Tea Kettle



Tape Dispenser

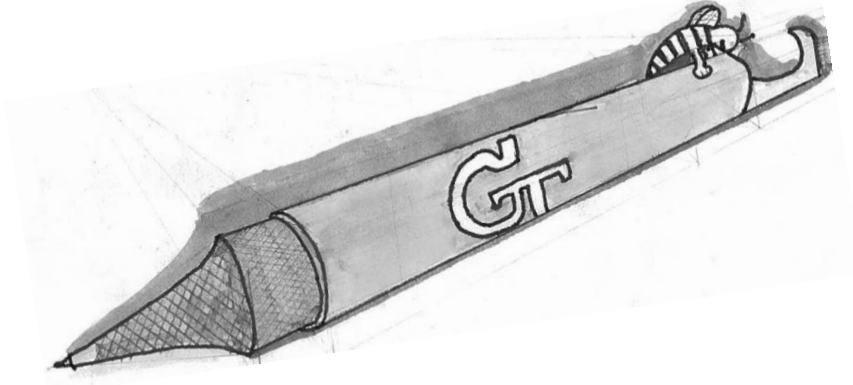


Portable Cup Holder

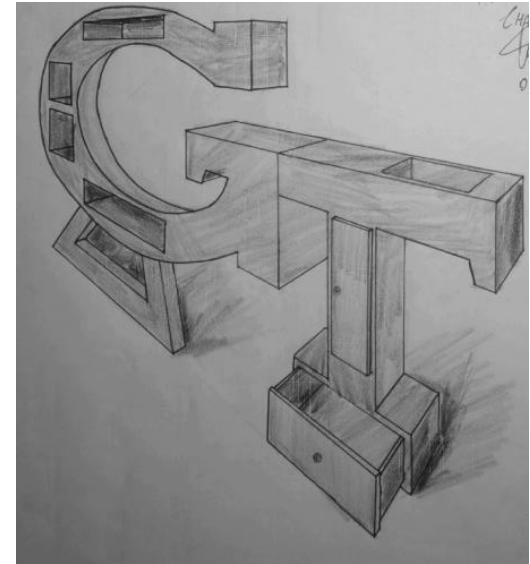


Table Lamp

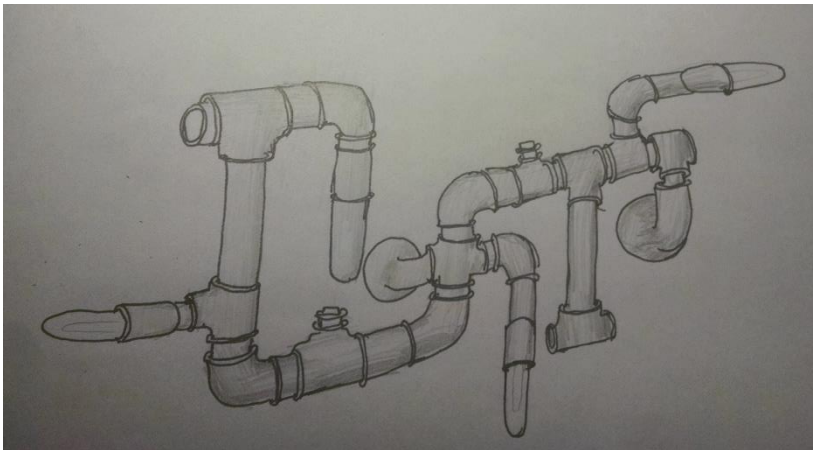
# UnTiED ideation + Design Heuristics : More Examples



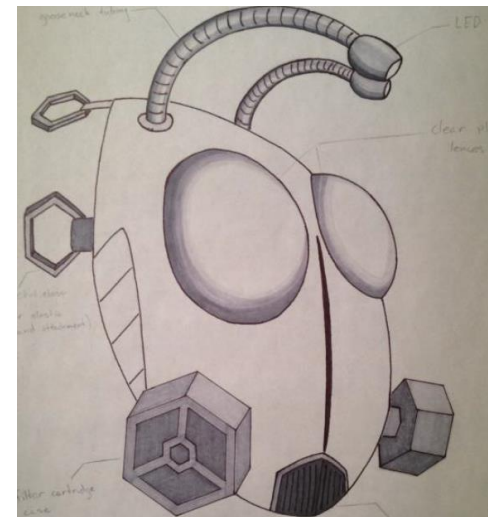
Pen with bottle opener



Organizer



Wall mount Lamp



Pollution Face mask