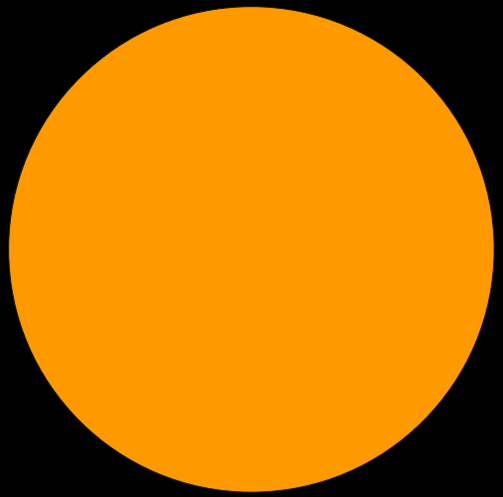


"EACH DAY MORE SOLAR ENERGY FALLS TO THE EARTH
THAN THE TOTAL AMOUNT OF ENERGY THE PLANET`S 6 BILLION
INHABITANTS WOULD CONSUME IN 25 YEARS.
WE HARDLY BEGAN TO TAP THE POTENTIAL OF SOLAR ENERGY"

SUMMER INTERNSHIP @ PHOCOS INDIA PVT. LTD.

ATUL V PARANJPE 05613802 INDUSTRIAL DESIGN IDC IIT BOMBAY

The Place: Auroville

"Auroville wants to be a universal town where men and women of all countries are able to live in peace and progressive harmony above all creeds, all politics and all nationalities. The purpose of Auroville is to realize human unity."

Auroville Energy Products

Auroville Energy Products' (AEP) was founded in 1996 by Carsten Michelsen. It specializes in solar energy products -such as in solar lamps, solar charge controllers and inverters to provide a complete solution for solar home systems-, wind energy systems - design, supply and erection of wind-diesel hybrid systems- as well as micro-hydro systems.

The Company:

Phocos India solar private limited.

`CARE' Auroshilpam,
Irumbai post-605111
Tamil Nadu, India
www.phocos.com

The product development concentrates particularly on the problem of energy storage in autonomous electricity supply systems.

Goal is to increase efficiency and reliability and to lower the cost through intelligent production, storage and consumption of energy.

P R O D U C T S

Charge regulators

DC lamps

Power generators

Refridgerators

Energy system controllers

P R O J E C T O U T L I N E

Reference:

LED Lamps for Solar Applications

Extremely low power consumption
Very high illumination efficiency
12 or 24 V DC
Long lifespan
Infinite number of switching cycles

To design a LED based lighting device

Product brief:

1.LED based lighting device for indoor and outdoor use
2.robust body
3.portable and pocket able
4.for rural India and Europe
5.low cost
6.waterproof
7.multiple mounting options e.g. Handheld, wall mountable, bicycle mountable
8.With rechargeable batteries those can b charged through power from solar panels or DC adapter.
9.material specification: recyclable ISI standard materials

Technical Specifications:

2-4 hrs of continuous light
9V rechargeable Ni metal battery 280 mVAh or 500 mVAh
Approximately 8 LED`s
Charging voltage 12-18 volts
Charging from solar module

APPROACH:

Understanding the product
Understanding inside electronics and basic components
Approximately freezing on inside components

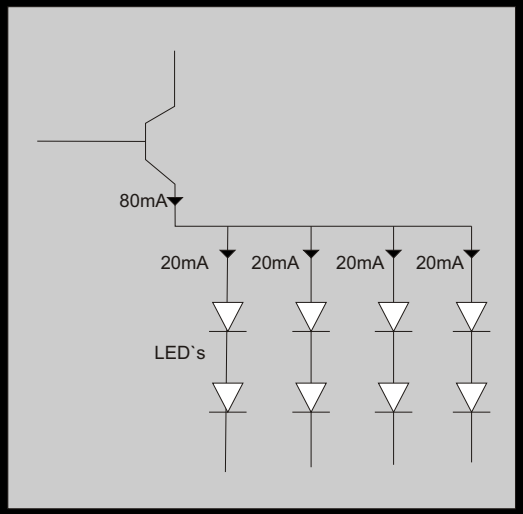
Idea sketching
user study
I started of with some of the basic sketching
Randomly visualizing various scenarios of product usage.
Sketching about human interaction with the product
Sketches about product look in general

Model making:
Made 5-10 thermocol models choosing the favorite designs

Product illustration:
Detailed product illustrations of 3 favorite designs
Various angles
In different colours
Various components and exploded views
Material specification

Technical calculations:

Number of LED`s and circuit design calculation:

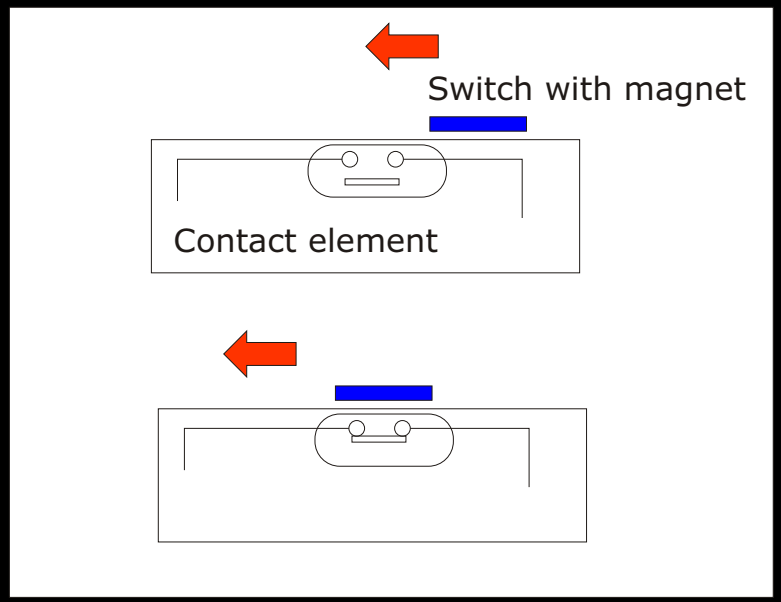


Torch should work continuously for at least 3-4 hrs. (Product brief constrain)
As battery to be used was Ni-metal 250 mAhr rechargeable (easily available)

There fore with reference to circuit diagram above,
pair of LED`s in parallel with other branches 8 LED`s
will run for approximately 3 to 4 hrs

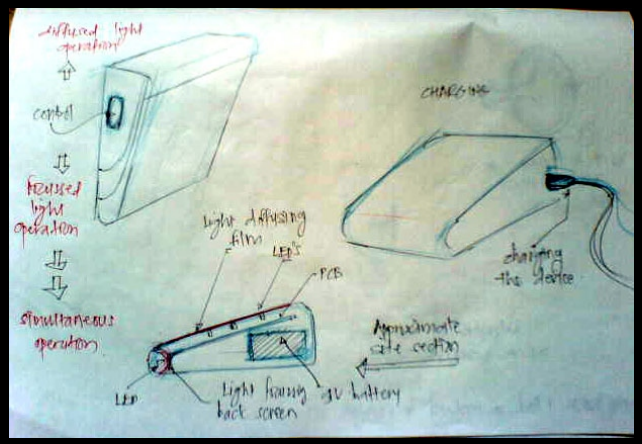
And if we get battery of higher rating say 500 mAhr battery will
provide 5-6 hrs of continuous light.

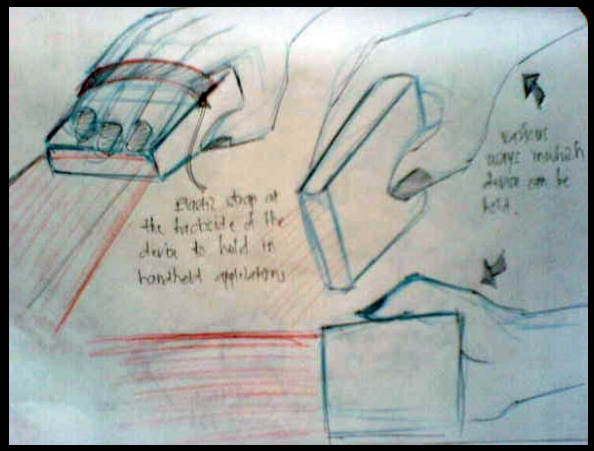
ON / OFF switch selection:

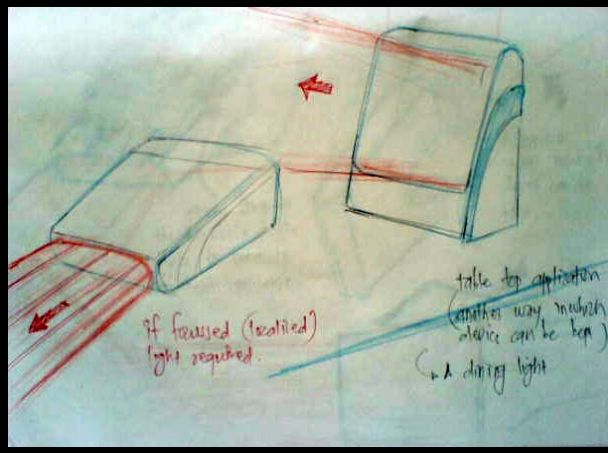


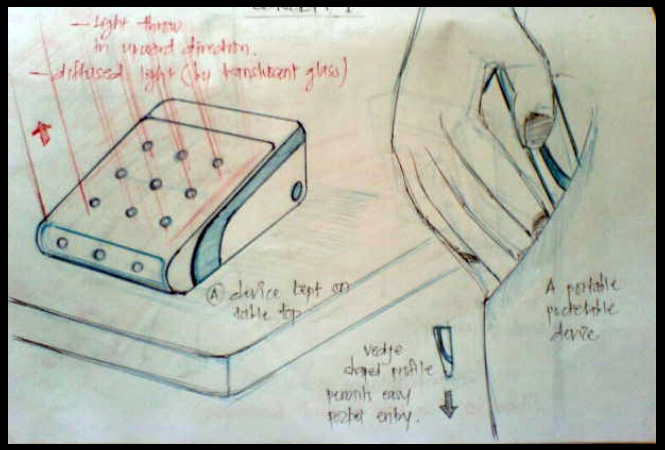
Switch should not become constrain to make the device water proof.
Considering this in mind switch based on magnetism principle was chosen.

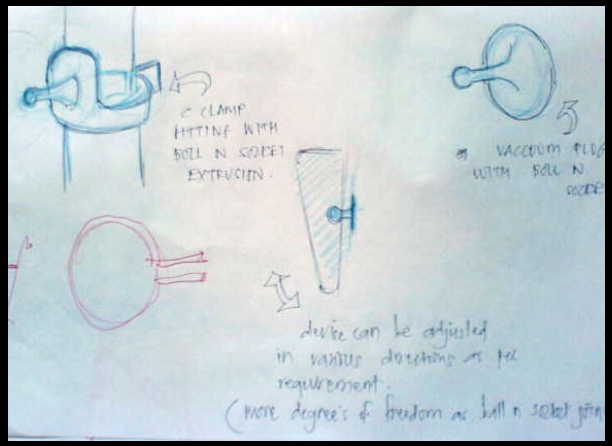
IDEA SKETCHING

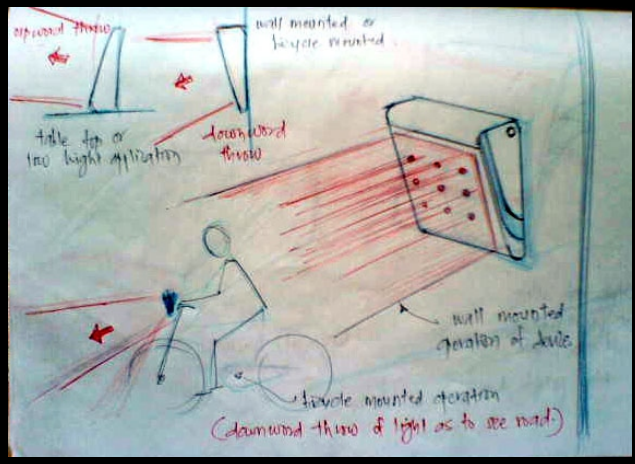


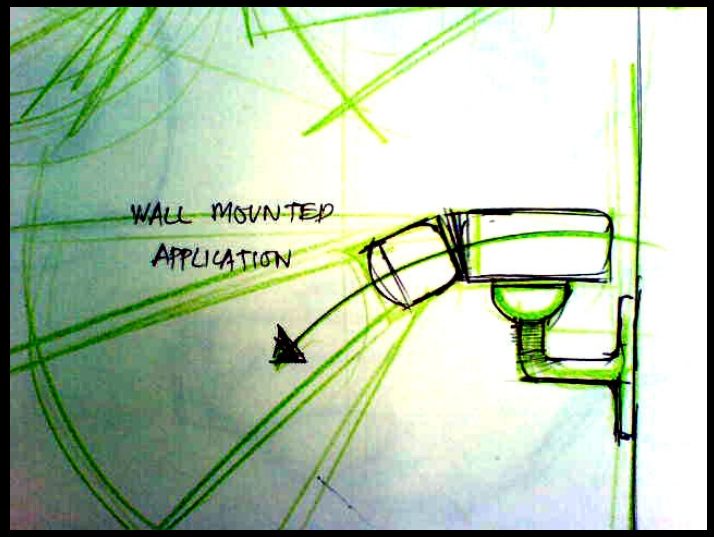


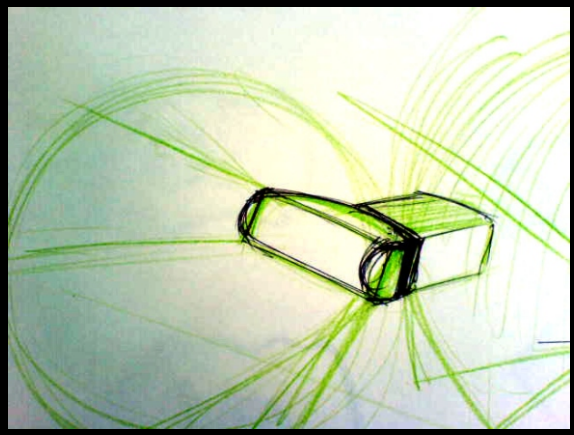


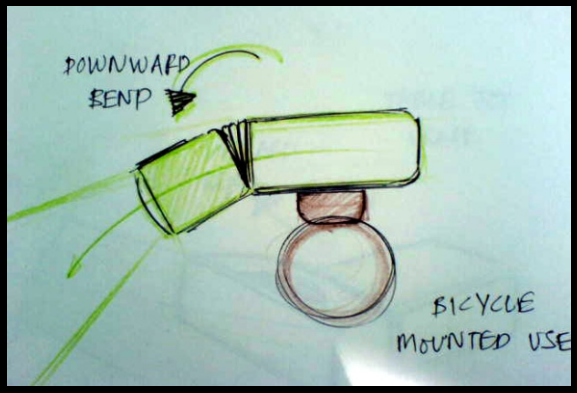


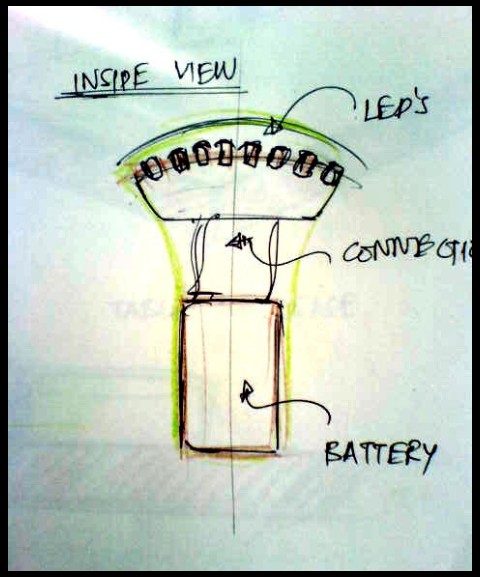





WALL MOUNTED
APPLICATION




DOWNWARD
BEND
BICYCLE
MOUNTED USE


INSIDE VIEW
LED's
BATTERY

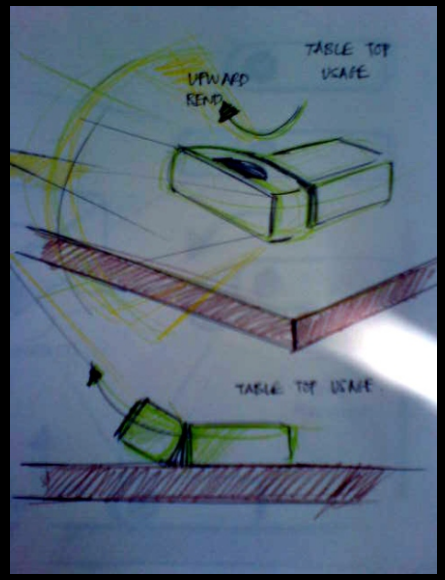
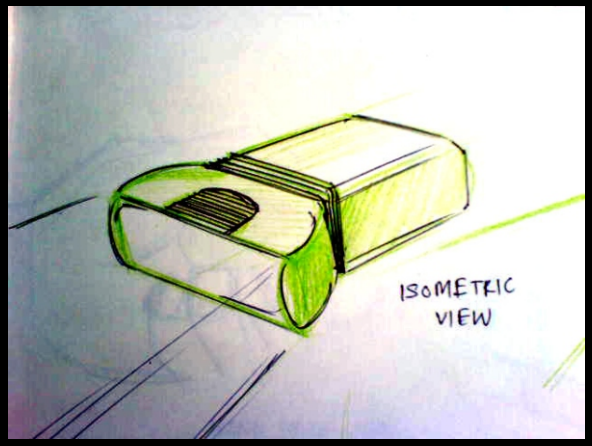
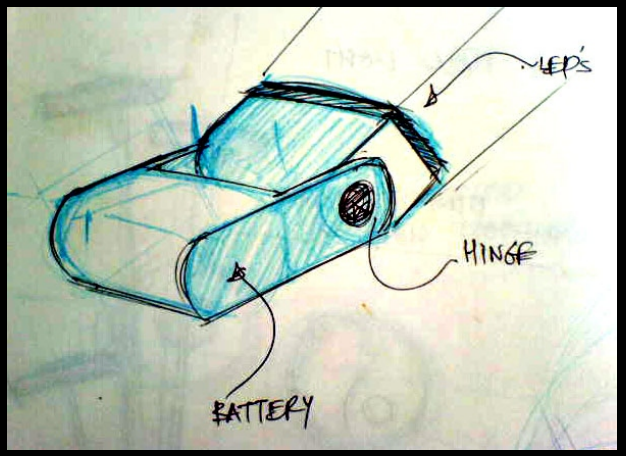


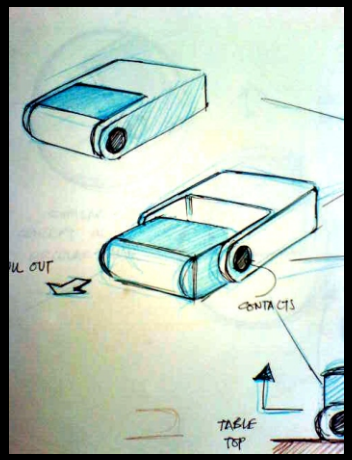
TABLE TOP
USAGE
UPWARD
BEND
TABLE TOP USAGE

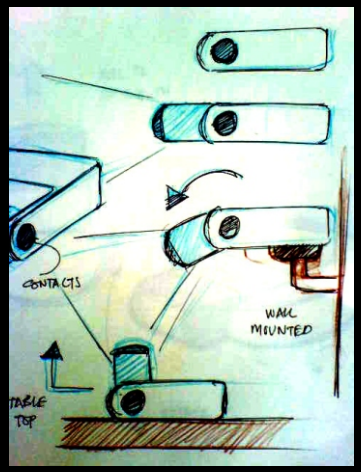

HAND-HELD
USE

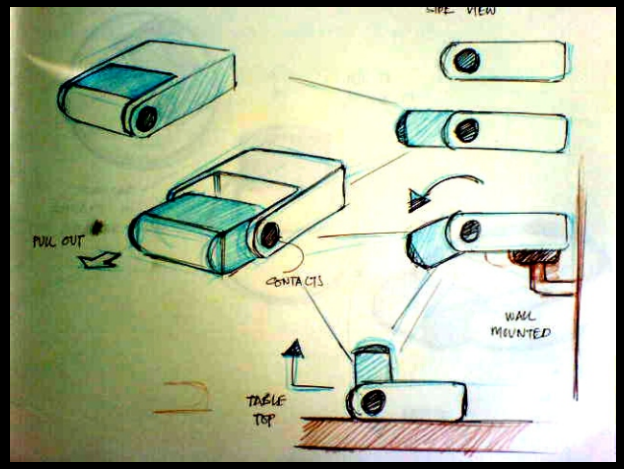

ISOMETRIC
VIEW

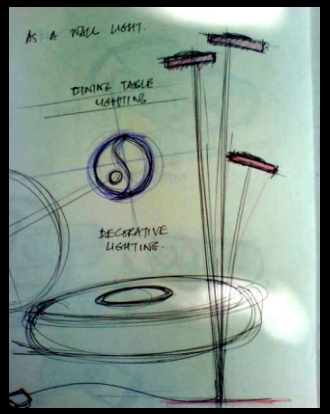
IDEA SKETCHING

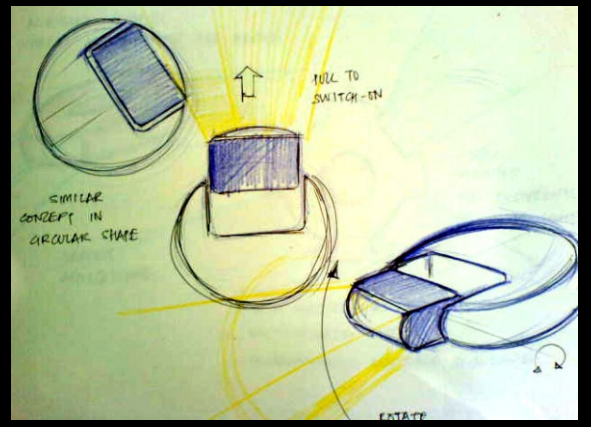


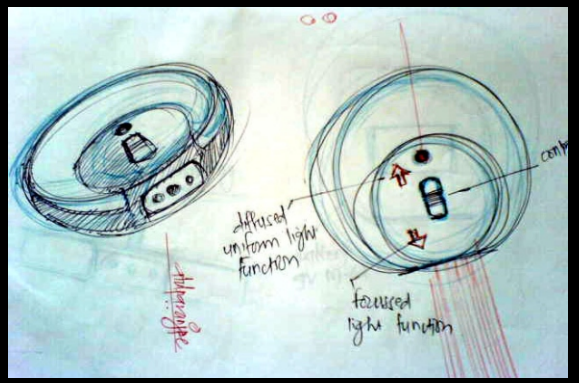




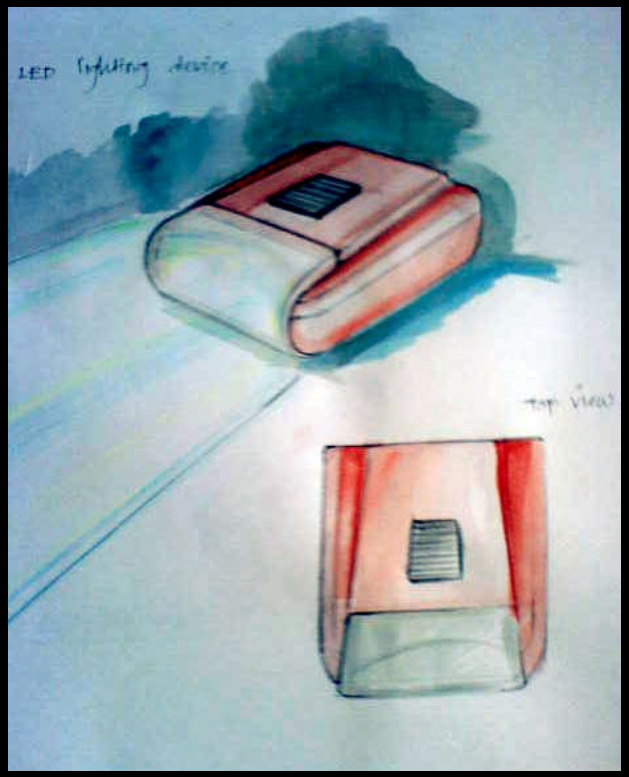


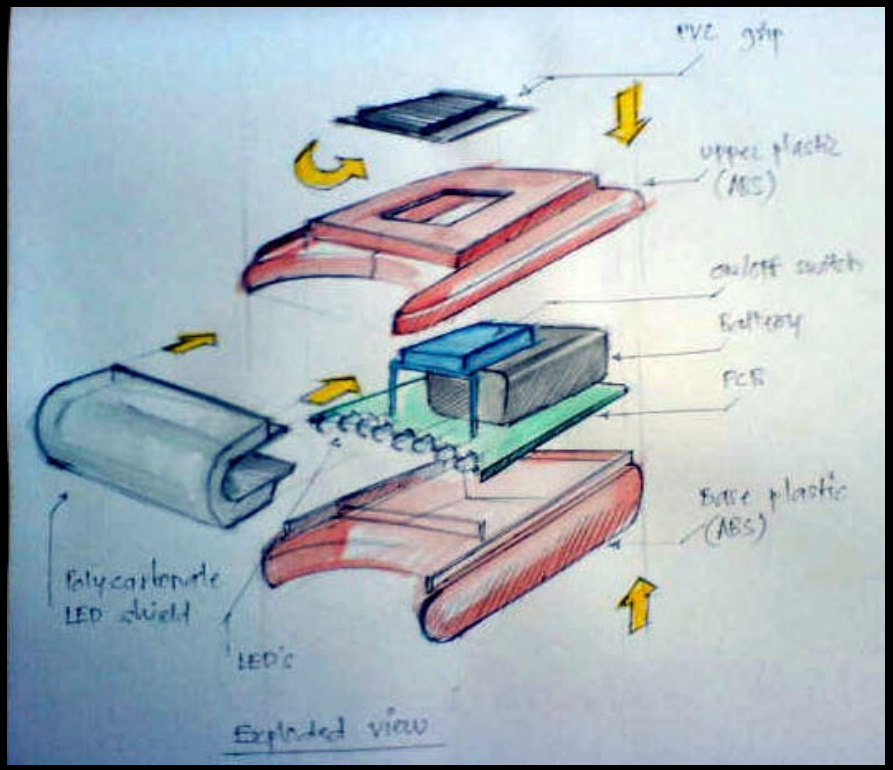




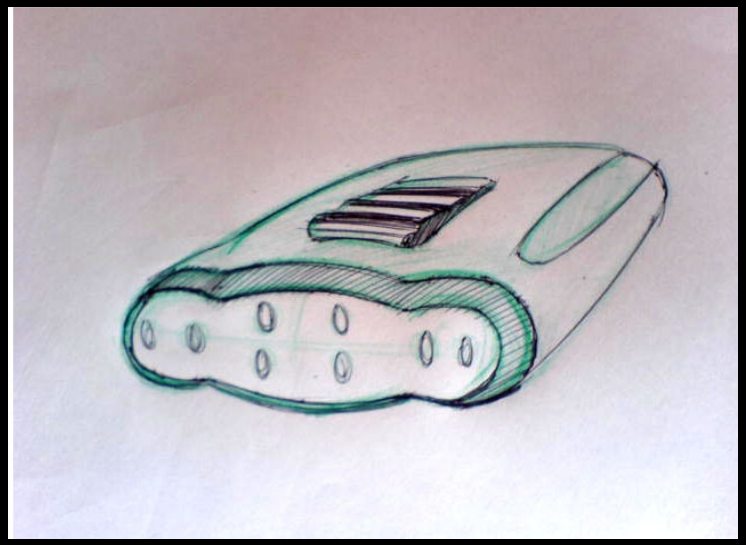


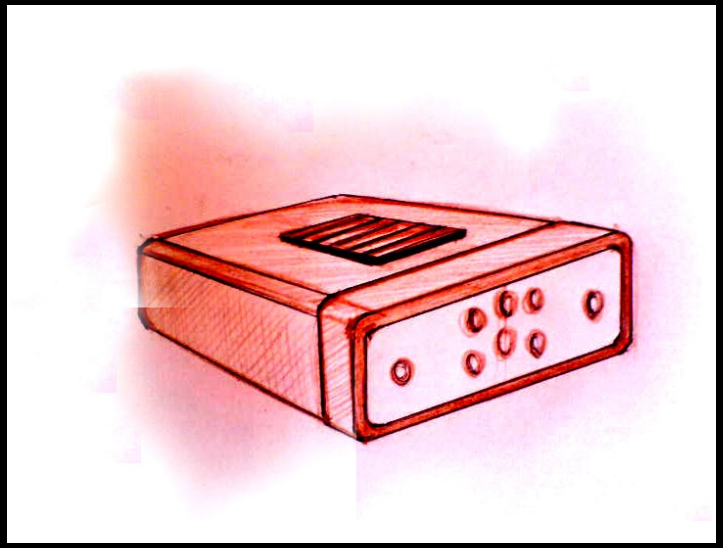
WATER COLOUR RENDERING TO ELABORATE EXPLOADED VIEW AND DETAILING

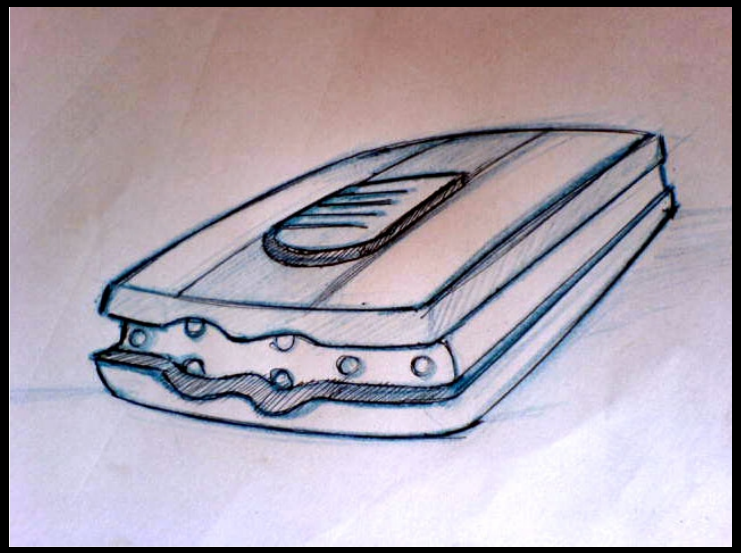


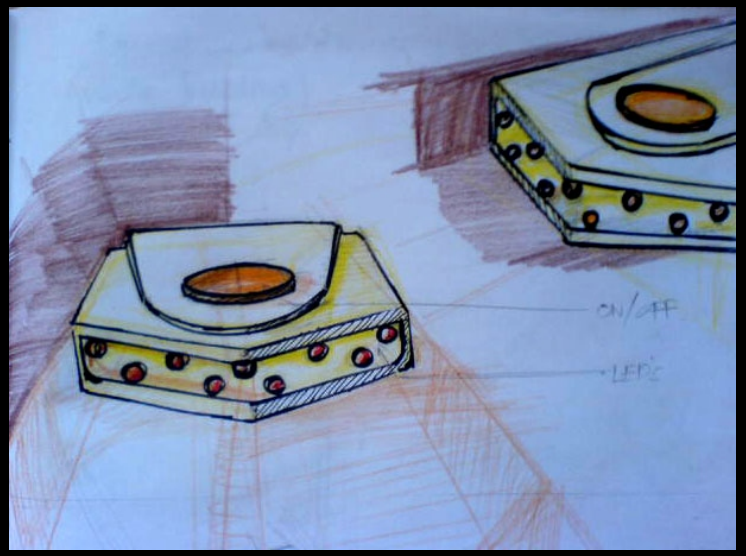


IN SEARCH OF INDIAN & EUROPIAN -BICULTURAL LOOKS









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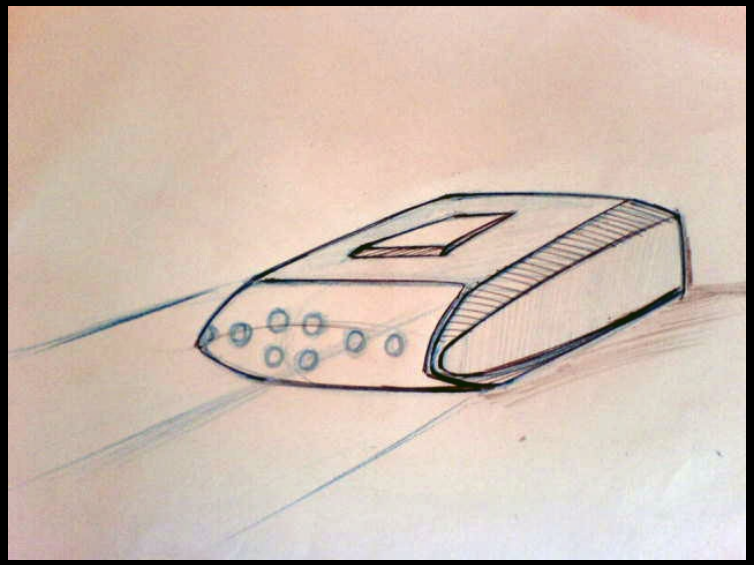
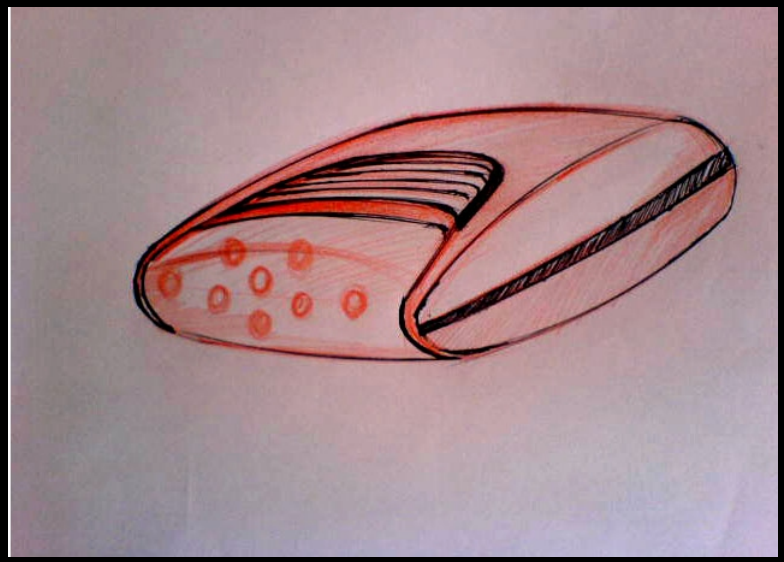
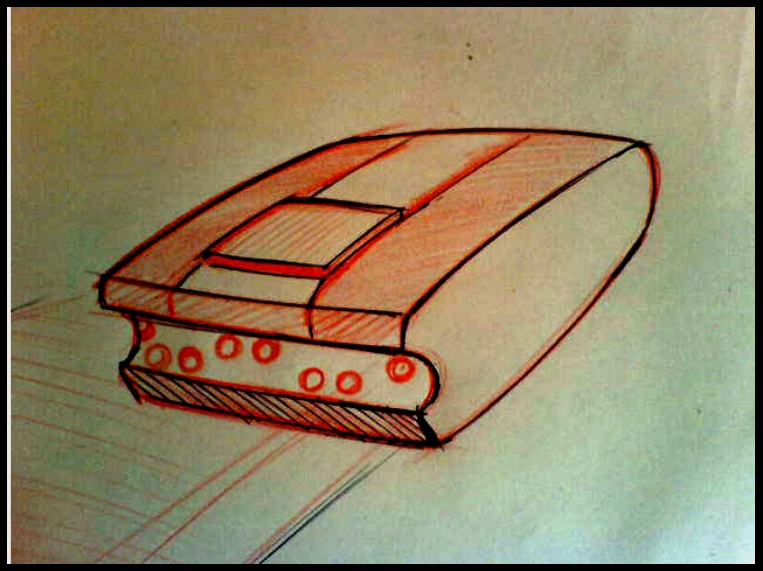
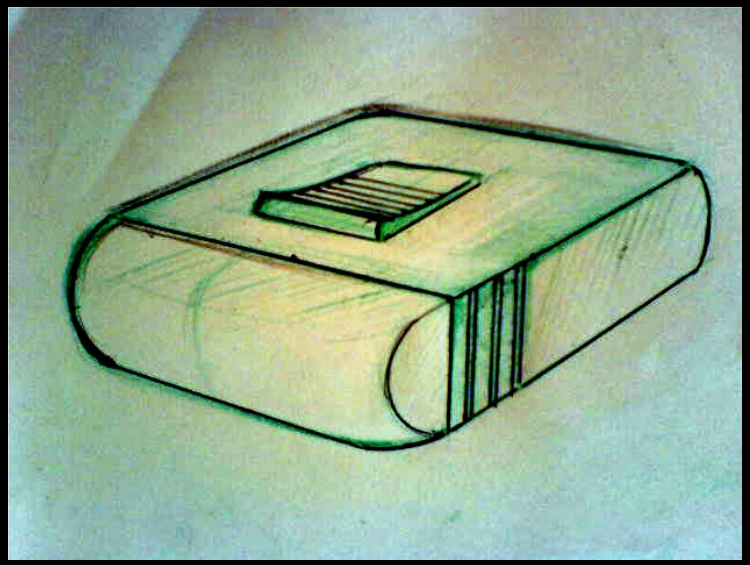
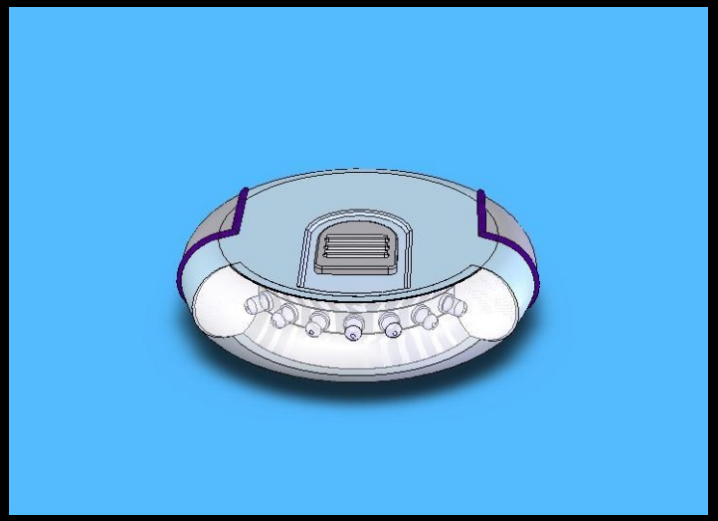


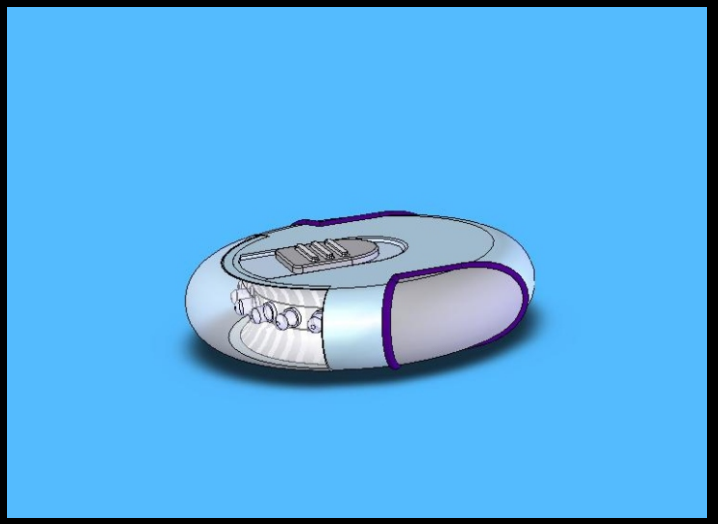


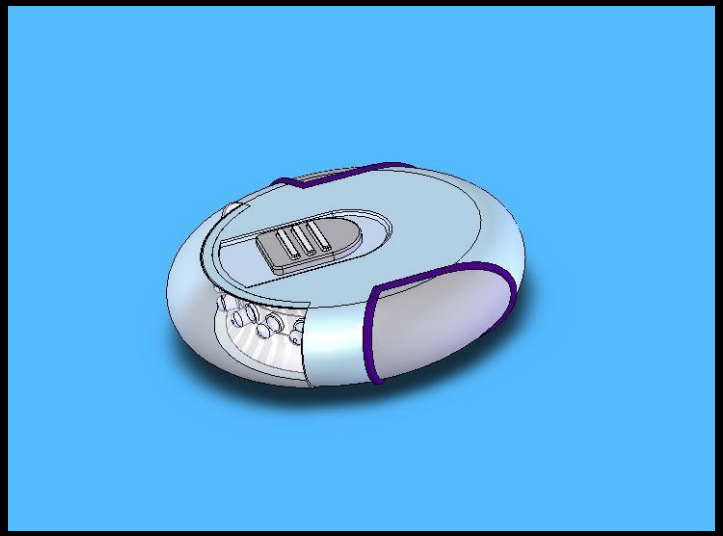


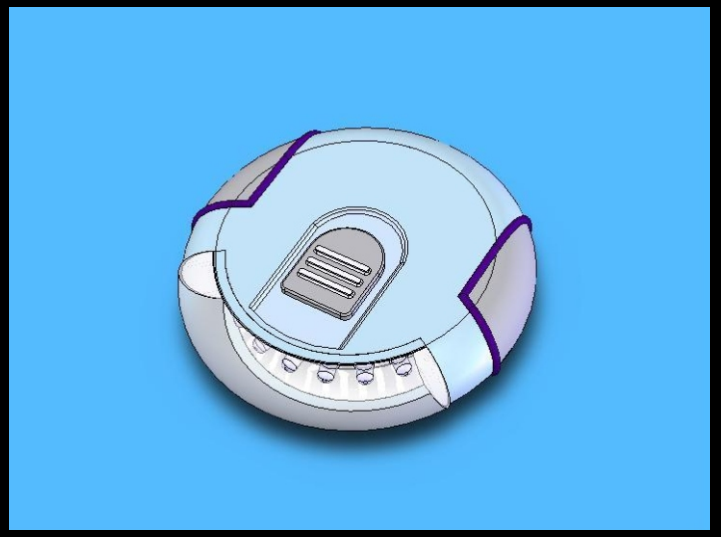


3D MODEL USING SOFTWARE SOLIDWORKS 2004









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THANK YOU