

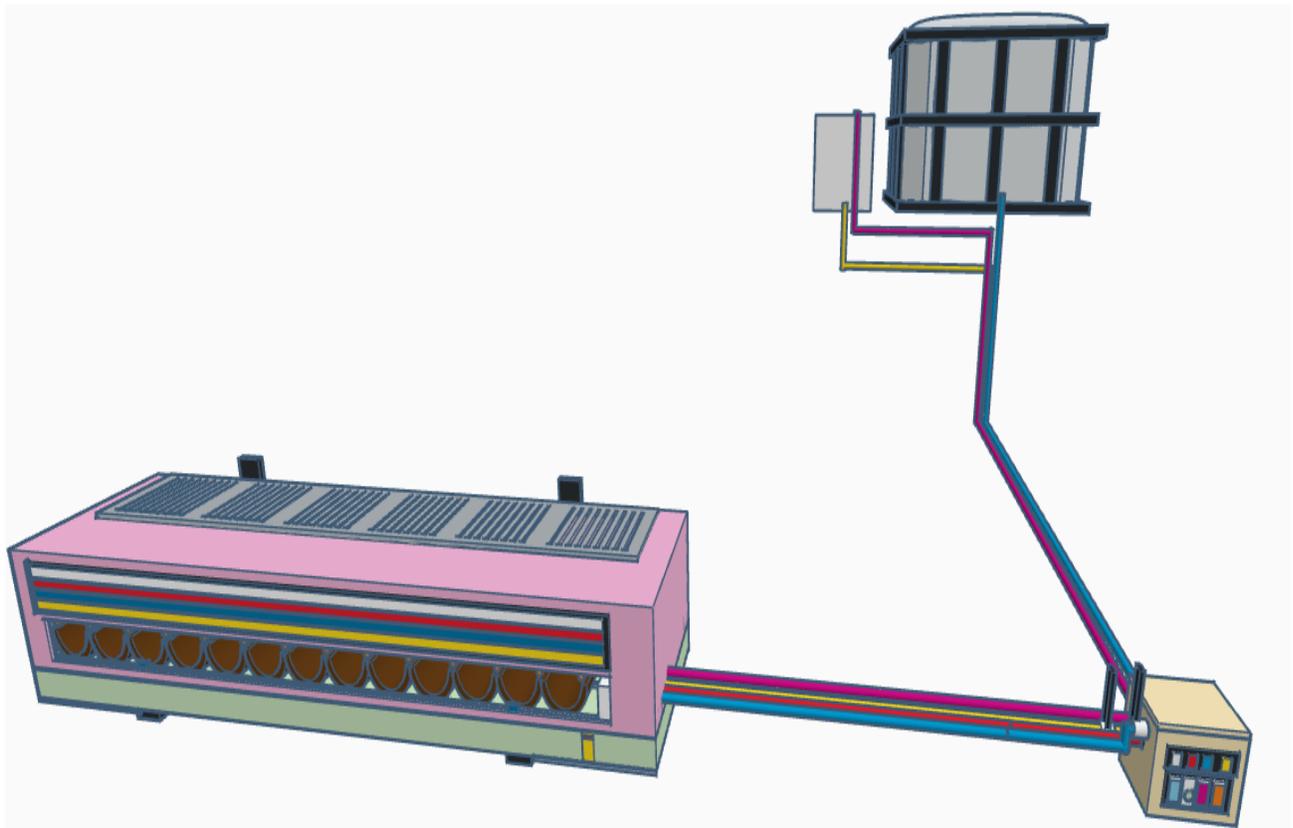


Government of Puducherry.
Department of Science, Technology and Environment
Puducherry Council for Science and Technology.
Dr. Abdul Kalam Science Centre and Planetarium.

Project Name : Terracotta Air Cooler
Student Name : H. Muhamedtajdeen
Design Number : 428126-001

Description:

This terracotta air cooler is like an evaporative cooling system based on the principle of evaporation. This terracotta air cooler provides cool air in summer season. It also provides purified air. It cools the air by using water and pots. This air cooler is designed for rich and middle class families. By using this air cooler, the percentage of electricity consumption decreases.



TERRACOTTA AIR COOLER

Functionality:

- **Filling the air cooler tank with water:** connect the plug to the plug point. Open the valve in between present in between the water tank to the air cooler tank. Close the valve still the water level reaches the red line in the water level indicator present in the air cooler tank.
- **Cooling the terracotta by using water:** Switch on the drip line pump, the water is converted into droplets and falls on the terracotta and becomes cool.
- **Cooling the air:** Now, switch on the blower switch and control the wind speed with the help of the regulator, the air travels through the terracotta and gets cool because of evaporation.
- **Lights:** Switch on the lights which colour you want (White, Red, Blue, and Yellow)
- **Switch off the air cooler:** First switch of the lights, blower, and drip line pump. Switch on the storage tank switch still the water present in the air cooler tank is completely shifted to the storage tank.
- **Reusing the water present in the storage tank:** Open the valve present in between the storage tank and the air cooler tank. The water returns to the air cooler tank.

Key Features:

1. Low cost.
2. Does not release Ozone Depleting Substances (ODS), such as Chlorofluorocarbons (CFCs) and Hydrofluorocarbons (HFCs).
3. Repairing process is very easy.
4. Easily portable from one place to another.
5. Does not cause any diseases in our body.
6. Converts hot air into cool air by the process of evaporation.
7. Low electricity consumption.
8. It prevents heat exhaustion.
9. It also purifies the air when it contains cap filters.

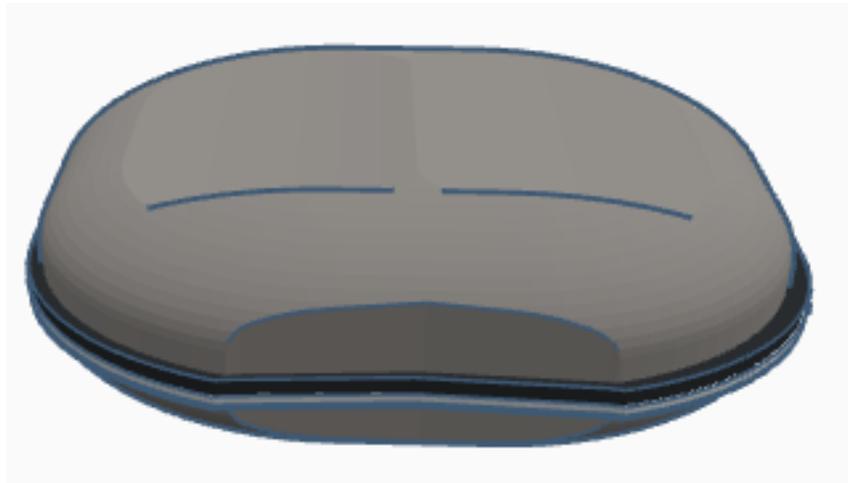


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Project Name : Thermal Reduction Cushion (TRC)
Student Name : M.S.Sanjeev
Design Number : 428128-001

Description:

This Thermal Reduction Cushion (TRC) is based on Non-Newtonian fluid which does not follow Newton's law of viscosity that is all fluids flow. This Thermal Reduction Cushion is a replacement of polyurethane foam car cushions which produce heat. But this Thermal Reduction Cushion decrease the amount of producing heat as the Non-Newtonian fluid is oobleck which is combination of water and cornstarch. There are various types of Non-Newtonian fluid. This oobleck is one of the Non-Newtonian fluids that are 'dilatants'. These dilatants are fluids which changes their viscosity with respect to force applied. It acts solid when force is increased and acts like liquid when force is decreased.



Thermal Reduction Cushion (TRC)

Functionality:

- **Changing of viscosity:** Newton's law of viscosity says that the shear stress is directly proportional to the velocity gradient. But this Non-Newtonian fluid does not follow this law. Dilatants (shear thickening) change their viscosity with respect to the force applied. They get harder when force is applied and gets soft when force is decreased.

- **Fermentation:** As the oobleck is combination of water and cornstarch, it gets ferment by some bacteria. If we want to stop this, we want to add some citric acid in the form of powder.
- **Reducing heat:** As the oobleck contains water, it keeps the fluid cool with respect to its surroundings. The oobleck is poor conductor of heat. So it will not transfer heat to our body.
- **Turning into powder:** After a month, the fluid becomes to turn as powder. On that time we have to add some water to it to get back to its form.

Key Features:

1. It gives more comfort than polyurethane cushion.
2. Reduce the production of heat.
3. Easy to make it in home.
4. Change its viscosity with respect to the applied force.
5. We can stop fermentation by adding citric acid in the form of powder.
6. Adding citric acid as powder instead of lemon juice will be more effective.
7. Low in cost.
8. We can refill it when needed.
9. Dilatants fluid changes their viscosity better than other Non-Newtonian fluids.

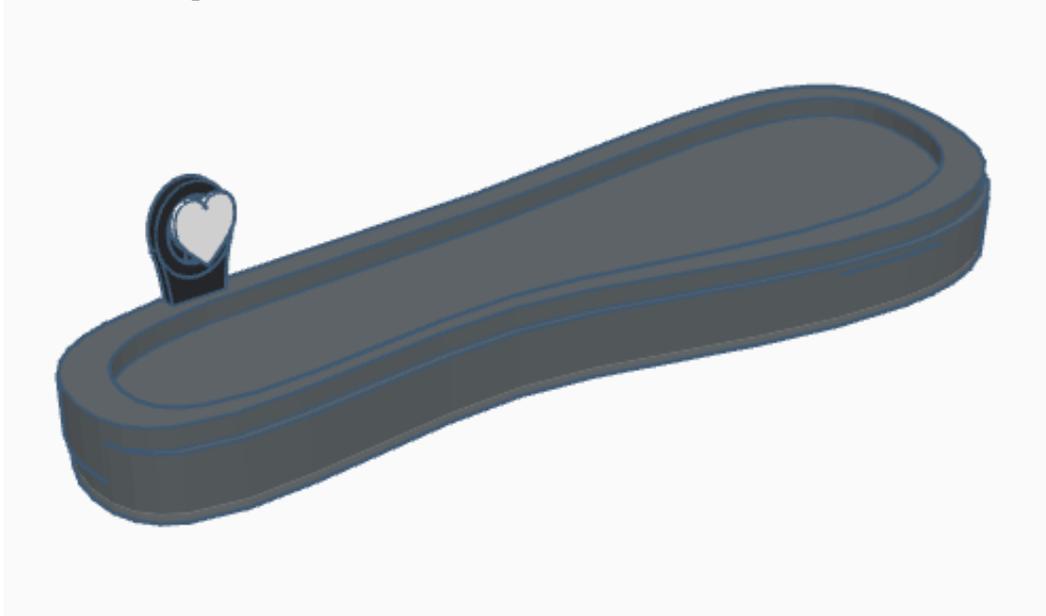


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Project Name : An Unconscious detecting shoe sole using Arduino Nano
Student Name : S.Sri Subanesh Mugunthan
Design Number : 428133-001

Description:

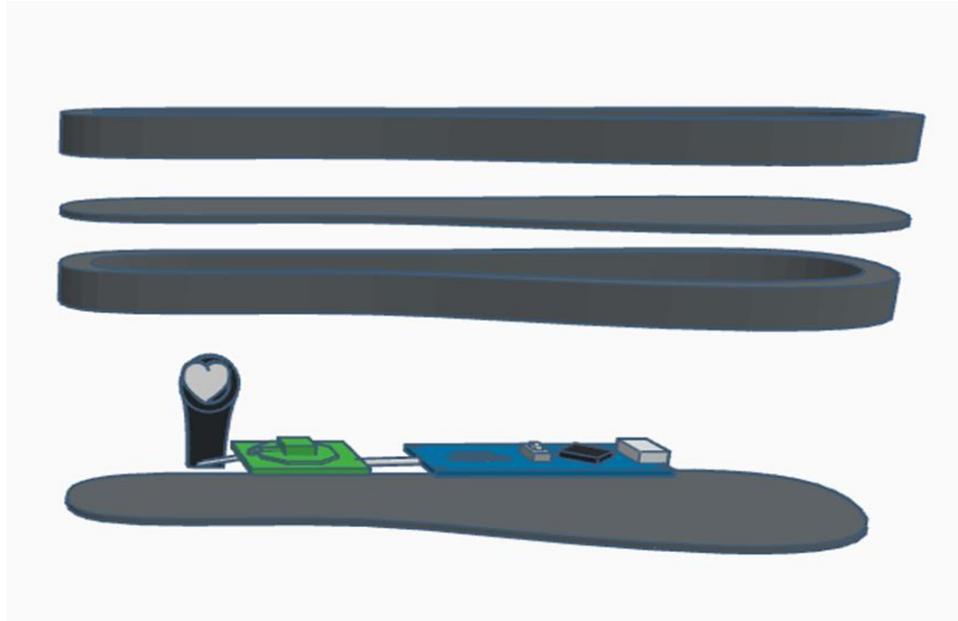
Unconscious is a state of sleep where a person isn't aware of what is happening in the surrounding. So, there is no device to detect unconscious. Here the design is a shoe sole where the device is kept.



An Unconscious Detecting Shoe Sole Using Arduino Nano

Functionality: The shoe has many parts such as sole, foxing, heel. Toe cap, etc. In that I use the sole to detect unconscious used. To detect Unconscious person's pulse rate will not be normal just it goes down, using Heart beat sensor it detects pulse to detect unconscious and send message to their children or relatives with GPS location .an alarm sound will produce from sole to known that the person is unconscious to the surroundings.

Here Arduino nano will the microcontroller and SUP500F Venus GPS used. AAA 4 batteries give power to operate. SIM800L used to send SMS to relatives. these parts will be inside the shoe sole.



An Unconscious Detecting Shoe Sole Using Arduino Nano

Key Features:

1. it helps us to make first aid to them.
2. It makes to send location through SMS which can be used to find them.
3. Help them from the serious stage going itself.
4. It is fixed inside shoe which is useful for many.

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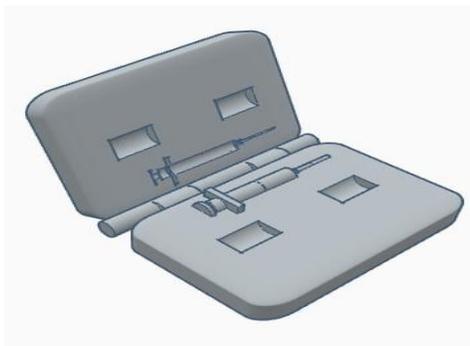
Project Name : Portable Insulin Conditioner
Student Name : M.S.Sanjeev
Design Number : 477242-001

Description

Insulin, which is essential for regulating blood glucose levels in individuals with diabetes, must be stored under controlled refrigerated conditions to maintain its effectiveness. However, continuous access to refrigeration is not always feasible, particularly for industrial workers and individuals engaged in outdoor or mobile occupations.

The Portable Insulin Conditioner is an innovative solution designed to address this challenge by maintaining insulin at a safe, cool temperature for extended periods without the use of electricity or batteries. The device is compact, lightweight, and ergonomically designed to fit easily into a pocket, ensuring maximum portability and convenience.

Operating on the principle of a vacuum flask, the conditioner minimizes heat transfer and preserves the internal temperature for several hours. This user-friendly and energy-free solution provides a reliable and convenient environment for insulin storage, significantly enhancing accessibility and safety for diabetic individuals in demanding work conditions.



Portable Insulin Conditioner

Key Features

- Operates on a vacuum flask–based cooling mechanism to retain low temperatures effectively.
- Compact, lightweight, and highly portable design, suitable for pocket storage.
- Equipped with a magnetic closure system to securely protect internal components from damage.
- Maintains cooling efficiency for more than seven hours.
- Includes two compartments for insulin vials and one dedicated compartment for a syringe.
- No requirement for electricity or batteries, ensuring uninterrupted usage.
- Cooling effect is generated through regular replacement of water, enabling sustained temperature control.
- Prevents the growth of fungus and bacteria due to consistently low internal temperatures.
- Designed with smooth edges and rounded corners to ensure user safety and comfort.

Key Function

The primary function of the Portable Insulin Conditioner is to preserve insulin at a safe refrigerated temperature, thereby preventing bacterial contamination and maintaining its medicinal efficacy. The cooling mechanism works by restricting heat transfer through convection and radiation, effectively limiting the movement of external thermal energy into the container.

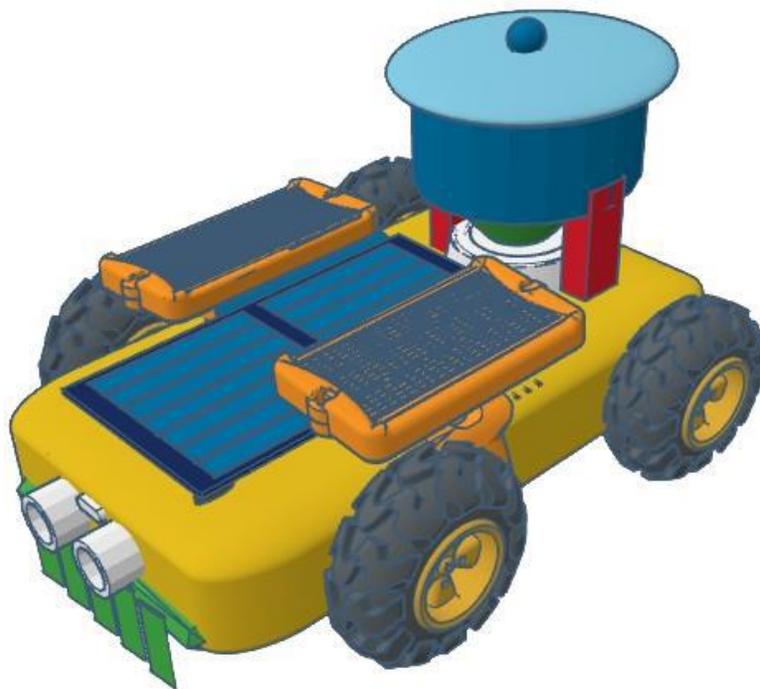
This simple yet effective thermal insulation approach eliminates complexity, ensuring ease of use and clear understanding for users from all backgrounds. The device promotes safe insulin storage in non-refrigerated environments, offering a practical and reliable solution for individuals with diabetes.

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Project Name : Seed Sowing Robot
Student Name : Yaash J Purohit, Sudharshan Muthukumar, Sarveash . K,
Design Number : 477242-001

Description

The **Seed Sowing Robot** is an innovative agricultural device designed to automate soil ploughing and seed sowing operations with minimal human effort. It features a compact and portable structure, making it easy to operate in small farms, gardens, and home backyards. The robot is capable of working efficiently on various terrains such as grassy land, loose soil, and muddy paths. Equipped with a seed storage container and a protective top casing, it ensures smooth operation and durability. Powered by solar energy, the robot promotes eco-friendly and cost-effective farming practices.



Seed Sowing Robot

Key Function

The primary function of the **Seed Sowing Robot** is to **plough the soil and sow seeds uniformly and efficiently**, reducing manual labor and increasing productivity in agricultural activities.

Key Features

1. Performs both **soil ploughing and seed sowing** operations.
2. **Compact and portable design** for easy handling and transportation.
3. **Terrain-friendly operation**, suitable for grassy, muddy, and soil surfaces.
4. Integrated **seed storage container** for continuous sowing.
5. **Solar-powered system** for energy efficiency and environmental sustainability.
6. Protective **top casing** to safeguard internal components from damage.
7. Ideal for **small farms, gardens, and backyard cultivation**.

