Introduction

Nowadays, there are two main types of battery chargers: the conventional one and the USB. However, they are unattractive and dull and there are not many companies researching the possibility of a new version either. These products only have basic functions and purchasing them will be based on the price.

In order to make a breakthrough in this industry and get customers fascinated, I designed a new battery charger which includes an emergency light, called the Liger. Its main function is the use of the emergency light. If the power supply suddenly cuts off, the emergency light will glow immediately so users will not be in the dark and will be able to see the circuit box and prevent any accident. It includes a shunt regulator which helps prevent overcharging so it is very safe to use. I believe it can provide customers with a better choice when deciding on chargers.

Objectives

• To make a breakthrough in this industry
• To inspire people to invent more creative products
• To raise the environmental issue awareness

Product Description

<table>
<thead>
<tr>
<th>Name</th>
<th>The Liger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>11cm x 6.5cm x 3.5cm</td>
</tr>
<tr>
<td>Battery Type</td>
<td>2 AA Batteries</td>
</tr>
<tr>
<td>AC Input</td>
<td>100-240V ~50/60Hz</td>
</tr>
<tr>
<td>DC Input</td>
<td>9V</td>
</tr>
<tr>
<td>DC Output</td>
<td>4V (maximum)</td>
</tr>
<tr>
<td>Output Current</td>
<td>1050mA</td>
</tr>
<tr>
<td>Charging Time</td>
<td>2 hours (maximum)</td>
</tr>
</tbody>
</table>

Product Function

- Battery Case
- Charging Light
- Emergency Light
- Relay-SPST - control the emergency light
- Battery Cap

Business Plan

Price: $129
Selling Places: Supermarkets, Electrical appliance stores, Department stores, Convenience shops
Target Customers: All kinds of people, especially housewives, frequent travelers
Marketing Strategy: • Press Advertisement • Shopping Mall Counter • Online Promotion

Experiment Results

Experiment 1

When the batteries are charging, the slope of voltage increases to reach the maximum and it then levels off. The zero slope in the graph means the charging process is completed and the fast charging mode switches to trickle mode.

As the transistor helps release heat and prevent overheating, the area around it becomes hot. Hence, the temperature of the transistor increases while the batteries are charging.

Experiment 2

Relationship between Temperature of transistor and Charging Time

The relationship between the temperature of the transistor and the charging time shows a linear increase. The temperature of the transistor increases as the charging time increases, indicating that the charging process is still active and the battery is being charged.