Medicine Reminder Device & Shampoo/Conditioner Identification Device

Project Specifications
**Medicine Reminder Device**

I. Introduction

A medicine reminder device for an independent, forgetful woman has been requested by the Ohio Respite Volunteer Program. Our Client, Mrs. Smith who is an 80-year-old woman, is required to take medicine twice a day for a number of medical conditions. Mrs. Smith is able to perform everything in her daily routine normally and independently, but has frequent states of confusion that causes problems to her medication time schedule. Our client is unhappy that her husband helps from time to time and denies her states of confusion that impairs her ability to stick to her medication schedule.

Mrs. Smith has no trouble with manipulating her medicine containers, liquids, or pills so the device should not be a dispenser. The purpose of this device is to remind her to take her medications on schedule and to keep track of her medication schedule so that she can regain full independence in her daily routine. Since confusion may arise with her medication schedule, the device must alert Mrs. Smith that it is time to take her medication at the proper time at the correct dosage. It is also noted that it is very important to be able to input the times and medications by the user which may include specifications such as time, medication name, and dosage amount. This is due to the fact that medications prescribed to our client may change upon time. In order to have her husband or other caretakers check her progress, the device should provide a summary of dates and times that the medicines are taken each day. Providing a so called “friendly” device is also very important with this client so that it would not associate negativity when using the device. Although optional, the device will try to accommodate the request of providing easy to play games.

II. Realistic Constraints

Economic:
- The total cost of the device must be less than our budget of $750

Environmental:
- Everyday wear and tear
- Waterproof
- Dust, UV Rays

Manufacturability
- Most parts of the device are available on the market
- Cost must be less than $750
- Appearance must be suitable for home and traveling environment

Safety
- Make sure it does not overheat
- All electrical components are safe
- No sharp edges or parts that are dangerous
Social
- Must blend in with home environment
- Must be easily transportable and not cause disturbance to the environment
- Updatable programs and games

### III. Technical Specifications (May change depending on designs)

#### Mechanical

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (unit without peripheries)</td>
<td>&lt;3 pounds</td>
</tr>
<tr>
<td>Size</td>
<td>8” x 8”x 2” approx., handle for transport</td>
</tr>
<tr>
<td>Button size</td>
<td>approx. 0.4” ~ 1” in diameter depending on keys</td>
</tr>
<tr>
<td>Durability</td>
<td>Withstand falls from up to 5’</td>
</tr>
<tr>
<td>Water Resistance</td>
<td>Drip-proof</td>
</tr>
</tbody>
</table>

#### Electrical

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Source</td>
<td>Battery Source</td>
</tr>
<tr>
<td></td>
<td>(i.e. Rechargeable lithium ion)</td>
</tr>
<tr>
<td>Display</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>approx. 2~5”</td>
</tr>
<tr>
<td>Width</td>
<td>7” max</td>
</tr>
<tr>
<td>Illumination</td>
<td>Visible in all light levels</td>
</tr>
</tbody>
</table>

| Display Measurements             |                                             |
| Medication Name                  | Manual Input of Title (up to 20 characters) |
| Dosage                          | Manual Input of Number (10-20 characters)   |
| Time Display                     | Time of next medication (5 characters)      |
| Alert Display                    | Vibrate, Alarm, and Volume (up to 20 characters) |

#### Hardware and Software Parameters

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microprocessor Programming</td>
<td>Expect to program in C++</td>
</tr>
</tbody>
</table>

**Output parameters**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarms</td>
<td>Medicine consumption time</td>
</tr>
<tr>
<td>Visual</td>
<td>Display Medication information</td>
</tr>
<tr>
<td>Character Size</td>
<td>Fairly Large</td>
</tr>
<tr>
<td>Menu Levels</td>
<td>Dependent on number of games</td>
</tr>
</tbody>
</table>
Environmental

Location     Home (indoors) and Travel (outdoors)
Dust     Recommend preventing large amounts of dust from settling on the device
Operating Temperature     40-105°F
Storage Temperature     32-110°F

Shampoo/Conditioner Identification Device

I. Introduction

A Shampoo and Conditioner squeeze voice gizmo for a woman who has a mild-to-moderate progressive cognitive impairment has been requested by the Ohio Respite Volunteer Program. Our Client, Mrs. Smith who is an 80-year-old woman, wears glasses due to her visual handicap. Our client complains daily of how confused she gets about which bottle is shampoo and which is conditioner. Since Mrs. Smith tends to forget which bottle is which, changing the shape, color, and size of the bottles themselves does not help.

The Purpose of this device is to provide a lightweight and waterproof gizmo that attaches to the bottles which, when squeezed gently or pressed, emit an auditory voice signal to identify the bottle. The device must be carefully designed so that it is compatible with different sizes and shapes of the shampoo and conditioner bottles. It is important to note that since it will be in a wet environment, it must be corrosion resistant at the same time. The device should be simple and easy to use.

II. Realistic Constraints

Economic:
• The total cost of the device must be less than our budget of $750

Environmental:
• Everyday wear and tear
• Waterproof
• Other shower hazards

Manufacturability
• Most parts of the device are available on the market
• Cost must be less than $750
• Appearance must be suitable for shower environment

Safety
• Make sure it does not overheat
• All electrical components are safe
• No sharp edges or parts that are dangerous
• outer casing of the device should be airtight to avoid a short circuit

Social
• Must blend in with shower environment
• Must be easily transportable
• Compatible with most sizes and shapes of shampoo and conditioner bottles

III. Technical Specifications (May change depending on designs)

Mechanical
- Weight (unit without peripheries): <3 pounds
- Size: Device itself should be approx. 5” x 5” x 2”
- Durability: Withstand falls from up to 5’
- Water Resistance: Water Proof

Electrical
- Power Source: Low Voltage Battery Source
- Display
  - Buttons: Red/Blue Illuminated

Hardware and Software Parameters
- Output parameters
  - Audible: Shampoo/Conditioner

Environmental
- Location: Shower
- Water: Recommend preventing large amounts of water from settling in the device
- Operating Temperature: 40-105°F
- Storage Temperature: 32-110°F