

SMART e-PILLS MEDICATION REMINDER

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Dedicated to my beloved mother and father

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ABSTRACT

These projects is “Smart e-Pills Medication Reminder” where it is design because from the survey, people are always busy with that their schedule that they tend to forget about their medication. There is much medicine storage available in the market with different design and sizes but this storage do not have the reminder to remind us of our medication. These storage maybe practical and convenient to the normal people but not to disable people, these people especially blind people are unable to see the medicine box thus it will be hard for them to know which pills to consume and at what time. They have to rely on other people to remind them about their medication and help them with it. It is also difficult for them to search for their medicine box in case they lost it somewhere. I did some background study to further increase the understanding of the problem and figure out the best solution to overcome it. So, I had come up with a design for the product and built a small, lightweight and portable medicine box from combination of materials like nylon, plastic and aluminum. This box is equipped with an electronic reminder, remote finder, pills compartment and pill splitter. The reminder uses buzzer to produce alarm sound to the MEDBOX Reminder to help remind the blind people of their medication time. The remote finder is a feature added in the MEDBOX Reminder that will help the blind people to locate the MEDBOX Reminder if they were to misplace it. The remote finder consists of transmitter and receiver. Once the button of the remote finder is push, the MEDBOX Reminder will produce a song which indicates the location of the MEDBOX Reminder. With the smart e-Pill medication reminder blind people will never miss their medication time again.

ABSTRAK

Kotak Ubat Peringatan merupakan satu projek yang di reka untuk semua orang bagi memudahkan pengurusan waktu pengambilan ubat mereka. Tetapi, projek ini adalah menjadi suatu keistimewaan kepada golongan yang cacat penglihatan. Kajian telah di buat, setiap orang kebanyakannya terlalu sibuk dengan jadual harian mereka sehingga mereka cenderung lupa tentang masa pengambilan ubat atau pil pemakanan tambahan mereka. Oleh itu, kotak ubat ini di reka dengan rekabentuk yang berbeza di pasaran iaitu dari segi saiz dan rekabentuknya malahan pula tiada alat peringatan elektronik untuk mengingatkan mereka tentang waktu pengambilan ubat. Kotak ubat ini adalah menjadi suatu kebiasaan buat insan normal seperti kita tetapi menjadi suatu keistimewaan kepada orang-orang yang cacat penglihatan yang mana terlalu sukar untuk mereka mengenalpasti jenis ubat dengan mengikut masa yang telah ditetapkan. Oleh itu, keputusan telah dikenalpasti untuk menghasilkan satu rekabentuk yang kecil, ringan dan mudah untuk di bawa kemana-mana dengan kombinasi fabrikasi nylon, plastik dan aluminium. Kotak ubat ini juga tersedia dengan alat peringatan elektronik, alat kawalan pengesanan, kotak penyimpanan ubat dan pil pembelah. Alat peringatan elektronik menggunakan buzzer untuk menghasilkan bunyi pada kotak ubat itu bagi mengingatkan waktu pengambilan ubat. Ciri-ciri alat kawalan pengesanan juga ditambah dalam litar ini supaya membantu orang cacat penglihatan untuk mengesan tempat beradanya kotak ubat itu sekiranya mereka terlupa. Alat kawalan pengesanan ini terdiri dari dua litar iaitu pemancar dan penerima iaitu apabila button di tekan, kotak ubat itu akan menghasilkan muzik bagi menentukan tempat kotak ubat itu diletakkan. Oleh itu, dengan adanya kotak ubat ini, setiap orang tidak akan perlu risau akan terlepas waktu untuk mengambil ubat.

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CHAPTER I

INTRODUCTION

1.1 PROJECT BACKGROUND

Smart e-Pills Medication Reminder is a project which is combination of hardware and software. This project is using a PIC (16F877A) to control the overall operation of circuit. The project is provided with a remote finder that will emit a song when a remote button is push and thus will help to locate the “Smart e-Pills Medication Reminder” and in a medicine box also has a pills splitter to cut pills into half. With this box, people don’t even to worry about how to manage their all medication time because this product have provided with a display clock and reminder will alert them about their medication time.

1.2 PROBLEM STATEMENT

As the pace of living is getting faster people tend to forget what they have to do due to their packed schedule. Therefore, there are inventions such as reminder, alarm, and so on to remind us what we have to do. [1]

I had focus to my scope to disable people and sick people; they also cannot escape from the pace of city life. Maybe many not realize that these people, they having difficulty to take medicine on time without other people assistant.

Therefore, I have come out with an invention, the “Smart e-Pills Medication Reminder”. The invention can store medicine and will remind the users include blind people when to take their medicine with alarm system. The “Smart e-Pills Medication Reminder” can help users include blind people to take the correct medicine on time. But, initially doctors, nurses, or family members have to fill the box with right medicine for blind users. However, the design indeed provide real benefit as the blind users now need less attention the use of “Smart e-Pills Medication Reminder”.

1.3 OBJECTIVES

The objectives of this project are as the following:

- i. To enable users include blind people to take the correct medicine on time with minimum people assistant.
- ii. To ease users to keep all medicines in one remote box this can be carried around easily.
- iii. To enable user to locate the “Smart e-Pills Medication Box Reminder” if they misplace the box with transmitter and receiver system equipped.

- iv. User friendly. Easy to use even for blind people with brills provided.

1.4 SCOPE

The scope of this project includes:

- i. Study the literature.
- ii. To come out with a design that benefit disable people.
- iii. To develop a working prototype for evaluation.
- iv. To provide progress report and a final report to show results and findings.
- v. To make an analysis for certain part that needed to prove the theories.
- vi. Test the function as the objectives required in this project.

CHAPTER II

LITERATURE REVIEW

2.1 INTRODUCTION

In Chapter II, the background of the project will be revealed. The past researches on the same topic and some scientific writings will be discussed and compared to this project. The literature review is made so that ones will understand the theory of the Smart e-Pills Medication Reminder. The researches have been done on the common and disable people about their medication time. From survey, majority of them forget to take the medicine on time. The survey shows that around 50% of the people that were involved in the survey had or has problem remembering their medication time. Worst, these disable people especially blind people are having a time taking the medicine. That is why I have to come out with a design of a portable medicine box with

reminder for these people to help them with their medication. This idea later leads to creating the Smart e-Pills Medication Reminder.

One of the reasons on making this device is to set the alarm to indicate the medication time for people. The box will vibrate and the buzzer will be activated during the time when they have to consume their medicine. Thus, it will be easier for blind people to remember to consume their pills. Misplacing their medicine is also one of the problems that the patients usually face. Thus the MEDBOX Reminder is also equipped with a remote finder that will emit a song when the remote finder button is pushed and this will help to locate the MEDBOX Reminder.

2.2 TYPE OF MEDICATION BOX REMINDER

Medication Box Reminder will be divided also to another type, function and size. At the western country, Medication Box Reminder is designed in variety shape, size and have own function. But, the design is not user-friendly to the blind people where it is not provided with Braille on the surface of the pill compartment. The reminder systems of the Medication Box Reminder also don't have the remote finder box where the function is to locate the box if misplaced.

2.2.1 AUTOMATIC PILL DISPENSER [2]

E-pill Medication Reminders (e-pill, LLC) as in figure 2.1 below is a rapidly growing company located on Route 128 in Boston. Since 1999, we have focused on innovative ways to monitor medication taking and helping patients remember to take their medicines correctly (right time, right medications, right dosage). Our "e-pills" have been featured on national TV (CBS, CNN, NBC) and in print media (Reader's Digest, Washington Post, Business Week, WSJ, Business 2.0). Healthcare professionals

throughout the 50 states routinely recommend e-pill medication reminders and our devices are used in clinical trials by the pharmaceutical industry. Our guarantee; we offer award winning customer service (we have received the "Top Service" award by Yahoo! for superior customer service), 30-Day money back guarantee and a One Year warranty. All e-pill devices come with batteries and are ready to use right out of the box. Please try our customer service today! Best of Health, Team e-pill in Boston.



Figure 2.1: Automatic Pill Dispenser

2.2.2 MEDCENTER SYSTEM [2]

MedCenter Systems, LLC. was created in 2007 to bring this revolutionary talking monthly reminder system to the public. Now users and caregivers will have an easy way to track and manage one of the most important components of effective health care. The system works on our "Tri-Date Verification" system. Through our research, we discovered that often confusion can occur as to what day of the week it is, once a person retires and their daily norm is no longer dependent upon a work week schedule. Because of this, our system emphasizes the "Date" rather than the "Day of the Week". The "Date" is located on each Pill Box and Pill Cavity, the visual display of the Clock as well as audibly during the alert messages. This repetition of the "Date" helps ensure proper medication compliance, even when the user is unsure whether it is Monday or Tuesday. Refer to the figure 2.2 below is a detail of the MEDCENTER SYSTEM:-

- i. Load the entire month's meds into the (31) Daily Pill Boxes and place them into the Organizer with their Green ends up, showing they are full.
- ii. Set up to 4 Daily Alarms to alert you when your medication is due.
- iii. At the beginning of the day, take the correct Pill Box out of the stand and place it into the "Today's Pills" tray on the front of the Organizer Stand.
- iv. A repeating friendly reminder notifies you of the time, the date and which daily dose to take. *"Good morning! Please take your morning pills for the 20th."*
- v. Press the red "Alarm Acknowledged" button to confirm compliance and the MedCenter Talking Alarm Clock tells you when the next daily dose is due.
- vi. At the end of the day, return the Pill Box to the stand with the Red end up to show the day's pills have been taken.
- vii. Press the green "Talk / Time" button at any time for an audible notification of the current time and date.
- viii. Press the blue "Alarm Check" button at any time for an audible notification of the upcoming alarms.
- ix. The clock also features an easy to operate, talking, Set procedure for all four alarms, the time and date.
- x. Large easy to read LCD with backlight makes the clock easy to read, even in the dark



Figure 2.2: MedCenter System

So, both of this Automatic Pill Dispenser is:-

- i. Too costly
- ii. Not user-friendly to blind people:
 - a) No Braille on the surface.
 - b) Not easy for blind people to set the time.
 - c) The reminder system cannot vibrate.
- iii. No pill splitter or cutter.
- iv. If misplaced, it's hard to find or locate it.

2.2.3 PIL DISPENSER [3]

Pill Dispenser with 6 grids is a useful way of taking medication, When you dont need to take all the bottles, it can be set up by the user or by helper. Ideal for remember to take the medication, when you are away from home for a week or several days.

Refer to figure 2.3 below is the information for dimensions of the Pill dispenser:

- i. Length: 8.6cm
- ii. Width: 6cm
- iii. Height: 2cm
- iv. Weight: 27g



Figure 2.3: Pill Dispenser

2.2.4 PILL ORGANISER 7 DAY COMPARTMENT [3]

A dispenser to enable a selection of pills to be added to each daily compartment. It has large letters & braille on the compartment lids which are helpful for users with poor eyesight. Refer to the figure 2.4 below are the information for the dimensions of Pill Organizers 7 Day Compartment:

- i. Length: 16.5cm (6.5")
- ii. Width: 4cm (1")
- iii. Height: 3cm (1.25")
- iv. Weight: 31grams



Figure 2.4: Pill Organizer 7-Day Compartment

2.2.5 PILL ORGANISER SET OF 2 [3]

A dispenser to enable a selection of pills to be added to each daily compartment. The letters and compartments are helpful for users with poor eyesight. Refer to the figure 2.5 below are the information for the specifications of the Pill Organizer Set of Two:

- i. Diameter Of Heptagon Box: 8cm (3")
- ii. Depth Of Heptagon Box: 2cm (0.75")
- iii. Length Of Straight Box: 13cm (5")