

CHAPTER 1

INTRODUCTION

1.1 Overview

In an information-oriented society, all members of the Society have the right to obtain and use the information. Therefore, it is necessary to develop various devices, which can provide information to anyone easily[10]. Globally more than 44 million people are visually impaired. Illiteracy among this group is very high, much of which is attributed to the lack of reading material in accessible format such as braille. Physically challenged people like visually impaired or deaf-blind people are facing lots of problem while communicating or interacting with other people. To provide a helping hand towards the visually impaired, recent technological growth has been developing different skilled methods to enhance their communication procedures. For reading and writing visually impaired people always use Braille representation of different alphabets, digits, symbols etc. Braille is the language used by the blind to read and write. It is vital for communication and educational purposes.



Fig 1.1 Standard Braille alphabet

The Braille is a tactile writing system used by the blind and the visually impaired. It is traditionally written with embossed paper. Braille-users can read computer screens and other electronic supports thanks to refreshable braille displays.

They can write braille with the original slate and stylus or type it on a braille writer, such as a portable braille note-taker, or on a computer that prints with a braille embosser. Braille is named after its creator, Frenchman Louis Braille, who lost his eyesight due to a childhood accident. In 1824, at the age of 15, Braille developed his code for the French alphabet as an improvement on night writing.

He published his system, which subsequently included musical notation, in 1829 the second revision, published in 1837, was the first binary form of writing developed in the modern era. Braille characters are small rectangular blocks called cells that contain tiny palpable bumps called raised dots. The number and arrangement of these dots distinguish one character from another. Since the various braille alphabets originated as transcription codes of printed writing systems, the mappings (sets of character designations) vary from language to language.

Furthermore, in English Braille there are three levels of encoding: Grade 1, a letter-by-letter transcription used for basic literacy; Grade 2, an addition of abbreviations and contractions; and Grade 3, various non-standardized personal shorthand. Braille cells are not the only thing to appear in embossed text. There may be embossed illustrations and graphs, with the lines either solid or made of series of dots, arrows, bullets that are larger than braille dots, etc. In the face of screen-reader software, braille usage has declined. However, braille education remains important for developing reading skills among blind and visually impaired children, and braille literacy correlates with higher employment rates.

The scarcity of accessible information mediums for visually impaired people is recognized by many international organizations. But, even with advancement in developing many products, they failed to address issues like cost, portability, expanse in mass society and education etc. In order to overcome the above said challenges we designed a refreshable tactile braille display using relay switches which simulates the standard Braille display, where each character is characterized by six dots made up of small metals or plastic pins which could be vertically moved in upper or lower directions. Such refreshable braille displays allow users to access information in braille, through pins which rise and fall to represent braille dots.

As their (the visually impaired) information pathway is solely limited to auditory and tactile sensation[3], here in our device information is transferred to the person through tactile sensation achieved by means of finger tips running over rounded pin tips which are mounted over movable part of relay switch.

Tactile sensation is one of the most important sensory functions as it replaces the visual sensation of the persons with sight. Braille displays can be attached to computers or other processing. Using this device a blind can read confidential documents (Bank document, agreement document). A wide range of materials can be accessed using our refreshable tactile braille displays. This ranged from leisure material (such as books and magazines), highly confidential document (bank document), personal information (household accounts, family records, address book), to work related documents (such as spreadsheets, journal articles and diaries).

Some of the different contexts in which they would use a braille display are related to work, such as giving presentations, taking part in meetings, and carrying out specific tasks such as computer programming and braille transcription. Some respondents used braille displays for their hobbies, including quizzes, broadcasting and social networking in chat rooms or through instant messaging.

1.2 LITERATURE SURVEY

There are diverse tools and equipment which are proving different facilities and features for enhancing the communication skills of the visually impaired people in a great extent. For interpretation of text by the visually impaired persons, most of the devices are designed to simulate the standard Braille display where each character is characterized by six dots which could be vertically moved in upper or lower directions mechanically or electronically or through any other mechanism. Also for writing the contents, same standard is followed for building any Braille writer. It is traditionally written with embossed paper. Braille-users can read computer screens and other electronic supports using refreshable braille displays.

A reading aid system is being developed for blind to access to Chinese books. This system consists of two parts: one produces a disc-book which carries the information in the form of braille codes. The other is a remote reading machine which can read the codes and present them to blind readers on a tactile braille display screen.