Audible Braille Teaching Device

I. Introduction

Shockingly, 90% of blind children in America cannot read Braille today. Traditional Braille teaching methods require the assistance of someone sighted or someone who knows Braille. Multi-sensory tools are the most effective way to teach early Braille to children. Such tools are expensive and rare in the market place today.

II. Background of the Invention

Many people are blind or visually impaired and as a result cannot read traditional print. These people cannot use the written word unless they use the Braille system. Braille is a system of raised dots which allows the blind and visually impaired to read tactically. Each of the 26 Braille characters is comprised of a pattern of raised dots which are "read" by the touch of the finger. The Braille six cell is the standard format used to form all Braille characters which represent the alphabet, words, numbers and punctuation marks. Braille teaching devices and methodologies today do not focus on these foundational characters.

Learning to read Braille is difficult for both adults and children. The 26 Braille characters make up the foundation of the Braille system. A student, who can learn these basic characters, has learned the foundation of beginning Braille. These same 26 characters represent characters, numbers and words. A Braille student normally requires many hours of assistance from someone sighted or someone who already knows Braille to translate Braille characters into audible sounds. The function of this present invention is to allow independent learning of the Braille characters tactilely and audibly through repetition using a cost effective device.

III. List of Figures

IV. Abstract

The present invention is a Braille teaching tool that audibly pronounces each Braille character as it is touched by the student. The device is comprised of a series of buttons connected to a microprocessor with memory wherein each button pressed produces a unique character, number or word. The processor is coupled to a secure digital flash memory card that contains the language specific Braille voice files. A person who is blind or visually impaired can feel the Braille character on the button then press the button to audibly hear the letter, number or word represented by the Braille character.

V. Brief Description of Drawings

Fig. 1 – Braille Teaching User Interface – frontal view of the user interface consisting of buttons with English letters and raised Braille characters, whereupon, each button pressed produces an audible representation of the associated Braille character.

Fig. 2 – Right Side View of Device- A right side perspective view showing the elevated user Braille buttons, the battery holder, Braille grade level selection switch and the SD card port.

Fig. 3 – Schematic Diagram – A diagram showing a microprocessor controlled audio playback circuit.

VI. Specification

The present invention consists of 26 foundational Braille dot patterns arranged in a standard alphabetical order. Each of the 26 user interface buttons **2** is injection molded to contain the unique Braille pattern **5** for each associated character **3**. The 26 user interface buttons are set in a framework **1** that easily fits in the hands of adults or children. The audible character is presented through the speaker unit **4** located in the center of the unit.

The right side view of the unit, Fig. 2, shows the length and height of the unit **10**. The unit is powered by a 9V DC battery **6**. The grade selection switch **7** is used to select either the foundational characters, numbers or beginning Braille words. A secure digital flash memory card **8** is used to store the prerecorded voice files for the corresponding characters, numbers and words. This SD card can be easily swapped to teach Braille in multiple languages. The user interface buttons' bezels **9** are slightly raised above the unit face.

When a user interface button is pushed, electrical contact is made to the associated switch S1 through S26 **11**. Each switch is connected to a 220Ω resistor in series with the next switch resistor combination. The additive properties of the resistors **12** allow for logic control of the microprocessor **13** through the software application that selects the appropriate voice file (character, number or word) on the SD card **8** through the unit speaker **4**. The double pole, triple throw grade selector switch **7** and associated resistors **12**, using the additive properties of the resistors, allows for the grade selection routine in the microprocessor to be invoked. Upon selection of each grade level, an audible file will be played through the unit speaker **4** indicating characters, numbers or words. Power is supplied to the electronic components through the battery **6**.

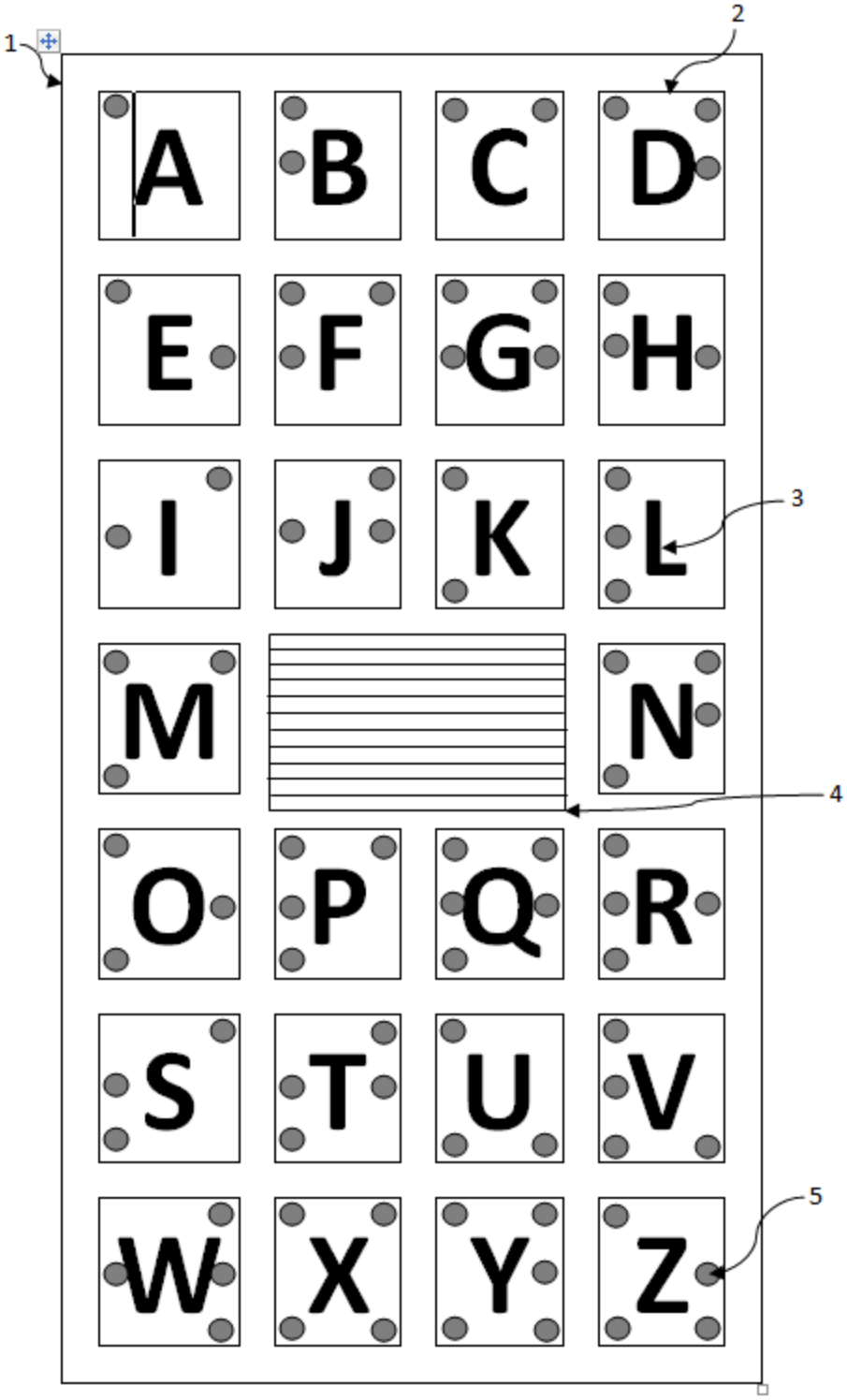


FIG. 1

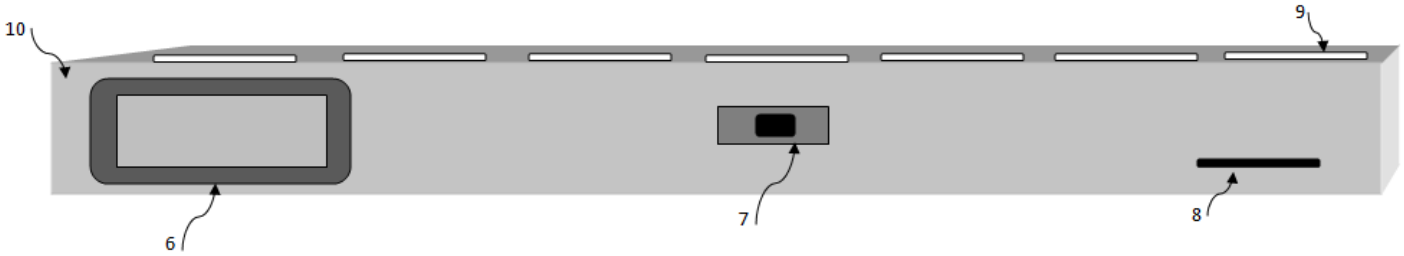
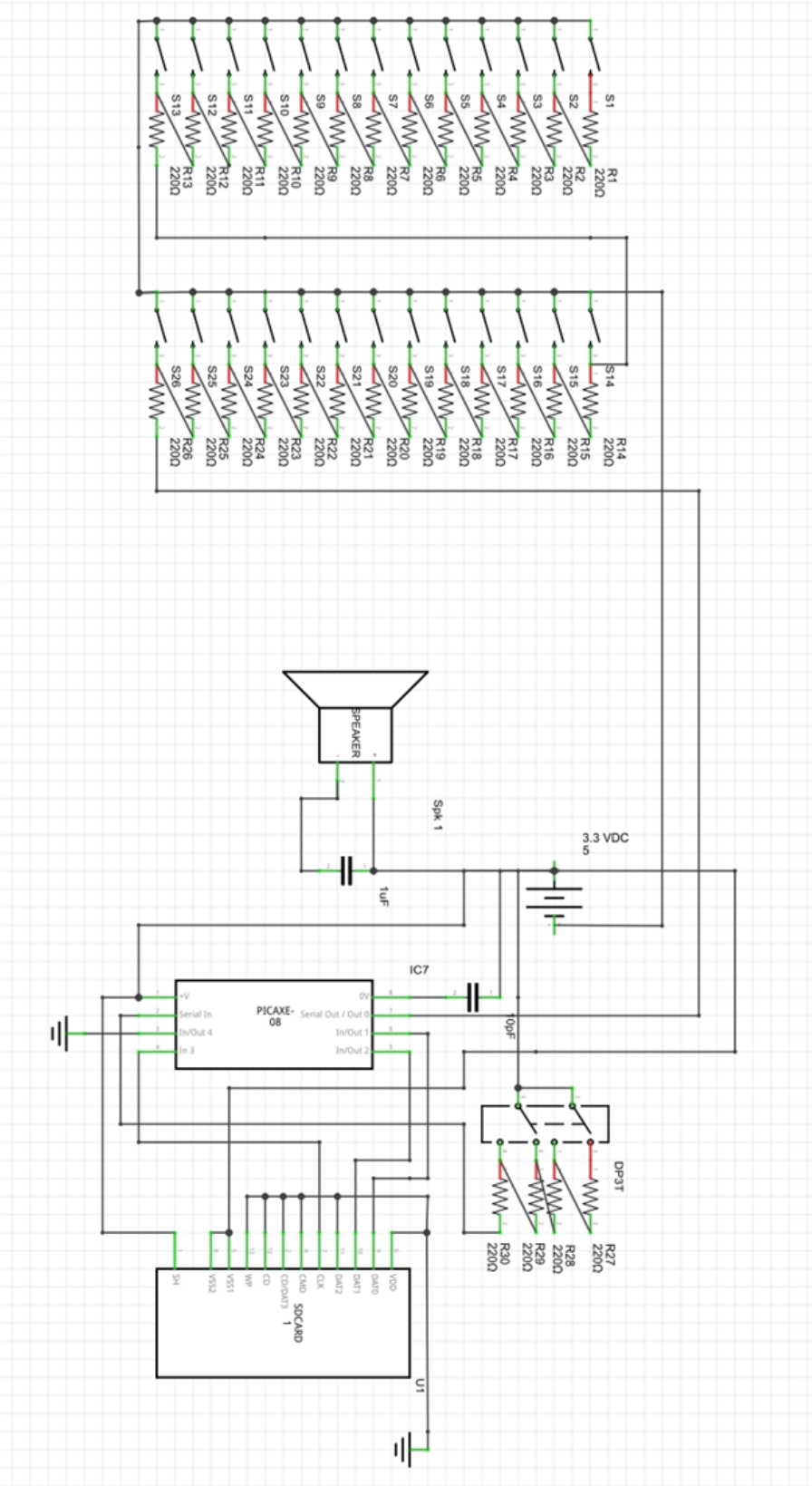


FIG. 2

FIG. 3


S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
S17
S18
S19
S20
S21
S22
S23
S24
S25
S26
R1 220Ω
R2 220Ω
R3 220Ω
R4 220Ω
R5 220Ω
R6 220Ω
R7 220Ω
R8 220Ω
R9 220Ω
R10 220Ω
R11 220Ω
R12 220Ω
R13 220Ω
R14 220Ω
R15 220Ω
R16 220Ω
R17 220Ω
R18 220Ω
R19 220Ω
R20 220Ω
R21 220Ω
R22 220Ω
R23 220Ω
R24 220Ω
R25 220Ω
R26 220Ω
SPEAKER
Spk 1
1uF
3.3 VDC
5
IC7
P1CAXE-08
+V
Serial In
In/Out 4
In 3
0V
Serial Out / Out 0
In/Out 1
In/Out 2
10pF
DP3T
R27 220Ω
R28 220Ω
R29 220Ω
R30 220Ω
SDCARD 1
SH
VSS2
VSS1
WP
CD
CD/DAT3
CMD
CLK
DAT2
DAT1
DAT0
VDD
U1