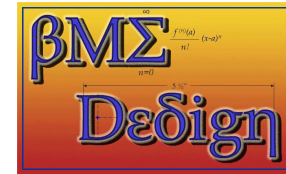




Augmentative Communication Device

Team Members: Prachi Agarwal, Erin Devine, Brian Mogen, Steve Wyche
 Client: Lawrence Kaplan, MD
 Advisor: Prof. Brenda Ogle



Abstract

Dr. Lawrence Kaplan, at the Child Development Clinic at the Waisman Center, has noticed that there exists a lack of communication devices for people who have lost the ability to produce sound. Current products are slow, impersonal and expensive. We have developed a device that allows users to interact instantly, have an unlimited vocabulary, and add inflection to their statements.

Background

- Patients with considerable neuromotor disabilities
 - Cerebral palsy
- Difficulties speaking
- Causes frustration
- Current technology not desirable
- Long-time ambition for improved device

Motivation

Problems with the current technology:

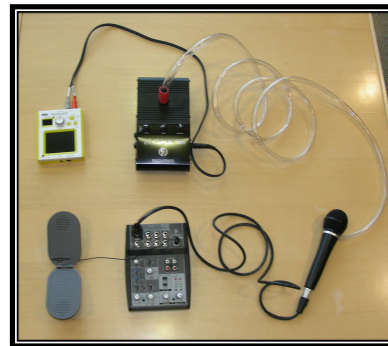
- Slow (approximately 30 words per minute)
- Users feel unintelligent
 - Can't always keep up with conversation
- Lack emotional expression
- Expensive (\$5000 - \$10,000)
 - Not used often

Client Requirements

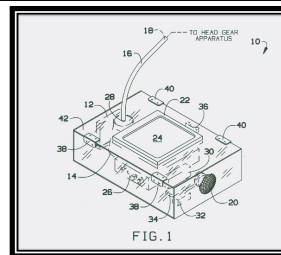
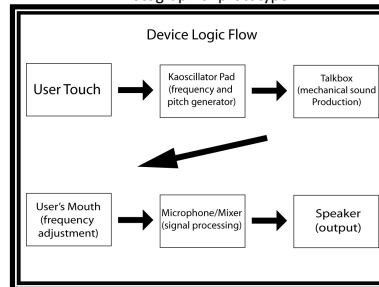
- Phonetics-based device
- Delay of less than one second between thought and speech
- Minimum of 30 words per minute output
- Ability to distinguish between statements, questions, and exclamations
- Create the ability to engage in normal, everyday conversation
- Affordable (Preferably under \$1500)

Final Design

- Kaossilator produces electric signal
- Talkbox turns signal into mechanical sound sent through tube
- Tube carries sound to user's mouth for modulation
- Microphone picks up and amplifies modulated sound
- Speakers provide output sound

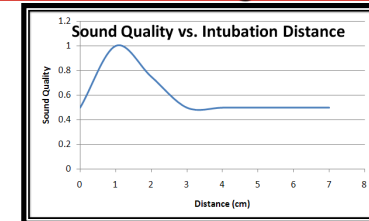


Photograph of prototype

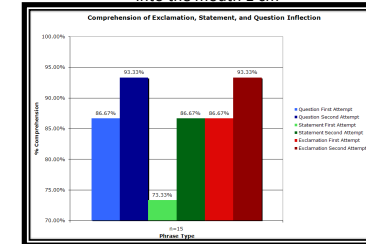


Final future design (patent pending)

Testing



The best sound quality was created when the tube was only inserted into the mouth 1 cm



Inflection was understood 91.11% of the time on the second attempt

Budget

KORG Kaossilator- \$149.99
 Rocktron Banshee Talkbox - \$159.00
 Various components- \$343.97

Grand Total: \$652.96

Future Work

- Package system as one part
- Integrate circuitry
- Develop method for sterilization (UV)
- Finalize patent process
- Present to interested corporations

Special Thanks

- Dr. Lawrence Kaplan
- Professor Brenda Ogle

References

National Institute of Neurological Disorders and Stroke. "Cerebral Palsy: Hope Through Research." http://www.ninds.nih.gov/disorders/cerebral_palsy/detail_cerebral_palsy.htm#803104
 Gait Analysis Laboratory. "Cerebral Palsy Program/Guide." <http://gait.aidi.udel.edu/gaitlab/cp/Guide.html>