

Specifications:

Accessible Weight Scale for Seated Users

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Team # 9

James I. Johnson

Patrick Tshilenge

Gregory Whitehouse

I. Introduction and Overview

The purpose of the device is to help seated users to monitor their weight several times a day. The scale will be integrated into a toilet seat rather than in a shower chair because a toilet seat is more accessible to a seated user several times a day and a toilet seat design will have less contact with water making it a safer and easier to produce scale. The scale will be integrated into a toilet seat in order to be convenient for the user, the convenience is essential because disabled users have difficulties using a standing scale. The wheelchair scales that are currently on the market are often bulky and expensive, many requiring the help of another individual.

The finished device will be easily accessible for a wheelchair bound user with either a dominant right or left hand. It will also be able to accurately measure the patient's weight to within one fifth of a pound. The scale will be capable of taking and displaying a reading in less than ten seconds, and will be displayed so that a user with diminished vision can see the reading. The weight readings will also be displayed in multiple modal formats. The user will be able to look at past measurements by using a scroll up and down button on the LCD interface. The device will be powered using battery power.

II. Realistic Constraints

Economic:

A significant economic constraint for the project is the expense of the device. A budget of \$2000 has been provided by the RERC for completion of the Accessible Weight Scale project.

Environmental:

Environmental constraints include variations in temperature and climatic conditions. The device will be used in a rest room setting; therefore, it must be water-resistant due to humidity and/or contact with water. As with many electrical devices, the weight scale must be able to sustain dust build up and be easy to clean.

The device will make use of an LCD screen, which would need to have certified disposal because of possible environmental hazards.

Manufacturability:

All of the parts/components for the manufacture of the device will have to be obtained from the open market. Materials used for the parts/components of the device may not be optimal due to limited tools the university machine shop. For example the machine shop is not equipped to work with plastic devices.

Safety:

Electrical components must be safe, abiding by FDA medical device regulations. The device must not overheat or have any sharp edges and points that could result in injury. It must adequately support the body of disable users of varying weights and sizes.

Social:

The device must blend in with clinical and home environments and it must be easy to operate for user and/or assistive users.

III. Technical Specifications

General Parameters:

Number of required operators: 1-2

Mechanical Parameters:

Measurable weight: 500 lbs +

Weight resolution: ± 0.5 lbs

Maximum weight of scale: 25 lbs

Environmental Parameters:

Humidity: 0-100%

Operating Temperature: Greater than or equal to room temperature

Storage Temperature: Greater than or equal to room temperature

Operating Location: Clinical or Home setting

Dust: Recommend preventing large amounts of dust from building up on device, will be easy to clean

Health Specifications:

Toxicity: None

Carcinogenicity: None

Flammability: 1

Reactivity: 0-1

Health: 1

Display:

LCD

Character Size: Greater than 1"

Number of Characters: 16

Input:

Command Button

Button Size: At least 1" in diameter

Power:

Power Button or Analog Switch

Button Size: Greater than 1" in diameter

Analog Switch: 1" in length

Battery Power:
DC Power: 12 V
AC Power: 120 V 60 Hz

Hardware and Software Parameters

Memory:

Data storage: 25 to 50 data points

Microprocessor:

Type: PIC microprocessor

Programming: Expect to program in Assembly Language or C++