Introducing the Power Grip

Major sports in the United States such as the National Football League (NFL), National Basketball Association (NBA), and Major League Baseball (MLB) are full of athletes. Football, basketball, and baseball players practice and train every day simply to compete against other athletes to determine the best. More importantly, these athletes sweat in the off-season to be on top of the world in their sport; winning the championship. When you compete, you want to win.

My passion for sports persuaded me to design an exercise device to enhance the performance of athletes as well as using it for rehabilitation when s/he gets hurt. I am proposing to design the “Power Grip” for my senior project. The Power Grip is a simple but yet sophisticated digital exercise device used to strengthen your forearm, wrist, and grip. The Power Grip is designed for athletes, but non-athletes can use it as well. The proposal will also talk about how the Power Grip can benefit non-athletes in more detail later.

Description of the Power Grip

The Power Grip is a small exercise device that fits in the palm of your hand. Using the Power Grip is easy. One must place his or her hand over the two arms of the Power Grip and squeeze them together. The Power Grip is shown below in Figure 1.

Figure 1 - The smooth arm is where you place your thumb. The curvy arm is for your fingers to fit perfectly over.
My design of the Power Grip will measure the number of repetitions and the power (either in watts or pressure per pound – the way sharks bites are measured) with each repetition. The repetition and power will be display on an LCD screen. The LCD screen will help the user track his or her workout without the help of a trainer or therapist. In addition, measuring the power of each repetition can help the user see whether s/he has improved in either repetition or power. A sample of the LCD screen is shown in Figure 2.

![Figure 2 – The LCD screen displaying the repetition and power.](image)

Along with the LCD screen, an On, Off, and Reset button will be attached to the LCD screen to help the user start, stop, or reset his or her workout. Additional features may be added as time and opportunity allows.

Shown in Figure 3 is a preliminary block diagram of the Power Grip.
The “Grip Sensor” block shown in the block diagram is a generic term in place of the actual sensor that will be use for the design. However, whatever the sensor, it will measure both repetition and power. Some sensors I am considering are the potentiometric sensor and strain sensors. More than likely, the sensor I will consider depends on whether or not I will be able to mount it on the exercise device to make the required measurements accurately.

Lastly, the Power Grip will be battery operated, making the Power Grip portable. A portable Power Grip with the LCD screen displaying your workout will be convenient for the users to carry anywhere and easy to store. If such a small exercise device that fits in the palm of your hand, such as the Power Grip is not portable, the design will be worthless and people will never purchase it. No one would ever want to use or buy a small exercise device that requires
you to sit in one place and worse, next to a power outlet.

Benefits of the Power Grip

Much of the discussions have surrounded sports and athletes, but I also mention briefly how the Power Grip can be use for rehabilitation purposes as well. Athletes put themselves at risk every time they compete both on and off the field (or court). Injuries are inevitable. At any moment in time, athletes can injure themselves. Usually athletes need time to heal and recover from any serious or career threatening injuries. The Power Grip can help the athlete in the healing and recovering process especially when the athlete injures the shoulder or arm area. Typically, when an athlete injures the shoulder or arm area, they lose some strength in the arm. If the shoulder or arm area requires some kind of surgery, the athlete may or may not lose more strength in the arm. Once an athlete injures himself or herself, it is difficult for them to make a full recover. The athlete will never be the same again, but can take advantage of rehabilitation and try to recover as much as possible of what is lost.

Throughout the rehabilitation process, the Power Grip can monitor every workout, eliminating the need for a trainer or therapist by using the LCD screen display. More importantly, the Power Grip can eliminate traveling to the workout facility because it is portable.

The Power Grip is not designed for or geared toward just athletes. The Power Grip is also designed for people with carpal tunnel syndrome or arthritis. Again, the rehabilitation process for those with carpal tunnel syndrome or arthritis is no different from that of an athlete.

Comparison of Similar or Competing Products

There are many similar products like the Power Grip at stores such as Sports Authority, Gart Sports, and Big 5 Sporting Goods. However, none of the similar products at these stores
can monitor your workout on an LCD screen. There are also no competing products out on the market, at least not to my knowledge. The employees at Sports Authority, Gart Sports, and Big 5 Sporting Goods also have no knowledge of any products that displays any workout features on an LCD screen.

**Project Development**

I purchased the Power Grip from Big 5 Sporting Good. Other than that, I am in the early stages of researching. The LCD screen display is about the only project component I have really researched. The LCD screen displays two lines with 16 characters per line. Professor Todd Morton will provide the LCD screen.

As far as measuring repetitions and power, I am considering a few different sensors to use. Since the sensor is the most important component of the design, I will definitely spend a lot of time researching each sensor very carefully in order to find the best one for the price.

**Project Demonstration**

The demonstration is going to be entertaining, interactive, and fun. When the Power Grip is complete, no other resource is needed for the demonstration. Probably, the only resources needed for my demonstration is a few volunteer to test out the Power Grip. The volunteers are needed to show the audience how the power varies from user to user.