Conventional planar springs have long been used in bolt assemblies, disc brake assemblies, valves, pneumatic controllers, and many other applications. Examples of these planar-type springs are spider springs, geophone springs, volute springs, disc springs, and Belleville springs. Some of the problems associated with these current designs are rotation in the platform, relatively small deflection, wear, and noise.

The ortho-planar spring described in this brochure is a compact spring with a platform that undergoes a large displacement in either direction, but does not rotate. The platform does not rotate and rub adjoining parts, resulting zero abrasive motion and a reduction in wear and noise. The planar nature of the spring makes it inexpensive to fabricate.

**ADVANTAGES**

The ortho-planar spring has many advantages over conventional flat springs. Some of these advantages, depending on the conventional spring application, are listed below.

- Inexpensive to fabricate
- May reduce part count and assembly
- Compact (thin)
- Large range of sizes possible
- Large bidirectional deflections possible
- No rotation/rubbing during deflection
- Reduced friction, wear and noise
- Eliminates dust from parts rubbing
- Easy to calibrate
- Less sensitive to variation in assembly

**SAMPLE APPLICATION**

One of many possible applications is a pneumatic valve controller. The spring was fabricated from 0.01 inch thick stainless steel. A ferrous button was attached to the center of the spring and placed near the nozzle opening. When an electric current goes through the coil it creates a magnetic field. This field pulls the spring toward the nozzle, which in turn restricts the flow of air through the nozzle.

**OTHER APPLICATIONS**

- Pneumatic valves
- Electrical contacts
- Keyboards
- Space applications
- Positioning and centering
- Compact camping gear
- Speakers
- Circuit boards
- Damping devices
- Precision antennae
- Touch probes

**INTELLECTUAL PROPERTY**

- Patent pending
- License available for many applications

**CONTACT INFORMATION**

Burt Knudson  
Technology Transfer Office  
Brigham Young University  
A-285 ASB  
PO Box 21231  
Phone: (801) 422-3676  
Fax: (801) 422-0620  
Email: burt@byu.edu

Brigham Young University Compliant Mechanisms Research