

## Non-Confidential Description - PSU No. 4046 "Reduction of Springback in Sheet Metal Forming"

### Keywords:

sheet metal, male punch, female die, rotating rollers,  
reduction of springback

### Links:

[Inventor Website](#)  
[Patent Application](#)

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### Background

Springback occurs when sheet metal returns at least partially to its original shape after being bent, making it difficult to assemble in the assembly line. Various techniques have been proposed to limit the amount of springback exhibited by different materials, such as over bending a piece of sheet metal in an attempt to anticipate the amount of springback that occurs. Another proposed technique involves hot forming of the material during the forming process; however none of these methods have proved completely effective. The invention is an improved sheet metal forming process along with an improved device to decrease springback

### Invention Description

In sheet metal forming, the male punch presses down on the metal while the female die is used as a holder on both sides. The proposed invention replaces the male punch and female die radius with rotating rollers of the same radius. During the forming process these rollers can be set to fixed, free (can rotate depending on the contact friction), or forced (by applying any external mechanism which can rotate the rollers independent of the friction between the material and rollers). This mechanism has the ability to reduce the springback of sheet metal deformation by up to 87%.

### Advantages/Applications

- Replaces male punch and female die radius with rotating rollers
- Rollers can be set to fixed, free, or forced based on desired formation
- Reduces springback by up to 87%
- Patent Pending

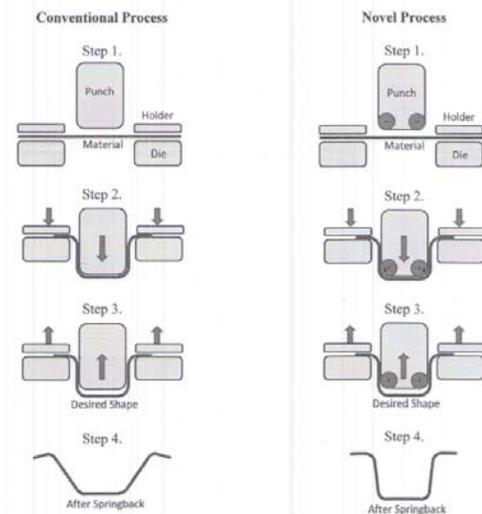


Figure 1: Comparison of traditional process vs. proposed process.