

## Bidirectional Hyperelastic Covers for Woven Stents

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### BACKGROUND

Medical stents are commonly used to repair or support damaged sections of blood vessels, to treat atherosclerotic disease and aneurysms. Such stents are implanted in more than half of the patients with coronary artery conditions. However, current stent designs frequently result in hazardous wrinkling of the cover upon deployment, substantially increasing the risk of stent failure, and subsequent morbidity. A highly bi-elastic stent cover optimized to match the stent's distortion during deployment may significantly reduce the failure rate of such procedures as well as open opportunities to treat damaged/diseased vessels.

### INNOVATION

UCLA researchers have developed a novel hyperelastic thin film nitinol (HE-TFN) that can be used to cover medical stents. This porous film maintains a deformation ratio that matches the commercial stent distortion during deployment. As a result, potentially dangerous kinks and folds that arise from the crimping/expanding process are substantially avoided. This ensures the conformal stent delivery and deployment. Furthermore, the design strategy and the hyperelastic material allow customization of the cover to different deformation ratios, making the novel cover widely applicable to various types of commercial stents.

### APPLICATIONS

- ▶ Replace current medical stents currently used to repair or support blood vessels

### ADVANTAGES

- ▶ Reduces risk of stent failure and patient morbidity by preventing wrinkling of the stent cover.
- ▶ Cover can be customized, making this design applicable to various types of commercial stents.

### PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,835,400	11/17/2020	2013-238
United States Of America	Issued Patent	10,085,862	10/02/2018	2013-238

### ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [A Multiferroic Transducer For Audio Applications](#)
- ▶ [Magneto-Optic Fiber Bragg Grating](#)

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### INVENTORS

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### OTHER INFORMATION

#### KEYWORDS

Stent cover, atherosclerotic disease, cardiovascular disease, aneurysms, coronary artery, medical device, surgical equipment

#### CATEGORIZED AS

- ▶ **Medical**
  - ▶ Devices
  - ▶ Disease: Cardiovascular and Circulatory System
- ▶ **Veterinary**
  - ▶ Other

#### RELATED CASES

2013-238-0

