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**Cartledge et al.**

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(54) **METHOD AND SYSTEM FOR LONG TERM ADJUSTMENT OF AN IMPLANTABLE DEVICE**

(58) **Field of Classification Search**  
USPC ..... 623/2.36-2.38  
See application file for complete search history.

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(56) **References Cited**

U.S. PATENT DOCUMENTS

5,171,266 A 12/1992 Wiley et al.  
5,800,533 A 9/1998 Eggleston et al.

(Continued)

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FOREIGN PATENT DOCUMENTS

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 105 days.

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OTHER PUBLICATIONS

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(57) **ABSTRACT**

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The present invention is directed to methods and systems for adjusting an implant, such as a mitral valve ring, over the long term without having to enter a patient's body. The long term adjustment system can include a magnet, or other magnetic material, that is functionally connected to the adjustment mechanism of an adjustable implant. The long term adjustment system can be activated by placing an activating magnet near the area of the patient's body where the adjustable implant is located and positioning the activating magnet so that an attractive force is generated between the activating magnet and the magnet that is functionally connected to the adjustable implant. Due to the attractive force between the two magnets, rotation of the magnet outside the patient's body will adjust the size and/or shape of the implant.

**Related U.S. Application Data**

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**A61F 2/24** (2006.01)

(52) **U.S. Cl.**  
CPC ..... **A61F 2/2448** (2013.01); **A61F 2/2445** (2013.01); **A61F 2/2466** (2013.01); **A61F 2210/009** (2013.01); **A61F 2250/0001** (2013.01); **A61F 2250/0004** (2013.01)

**12 Claims, 18 Drawing Sheets**

