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(12) **United States Patent**  
**Gammie**

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(54) **METHODS AND DEVICES FOR**  
**PERFORMING CARDIAC VALVE REPAIR**

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WO WO 2006/078694 7/2006

(\* ) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 296 days.

\* cited by examiner

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L.L.P.

(21) Appl. No.: **11/683,282**

(57) **ABSTRACT**

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**Related U.S. Application Data**

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7, 2006.

(51) **Int. Cl.**  
**A61F 2/24** (2006.01)

(52) **U.S. Cl.** ..... **623/2.11; 623/904**

(58) **Field of Classification Search** ..... 128/898;  
607/9; 623/2.1–2.37, 904

See application file for complete search history.

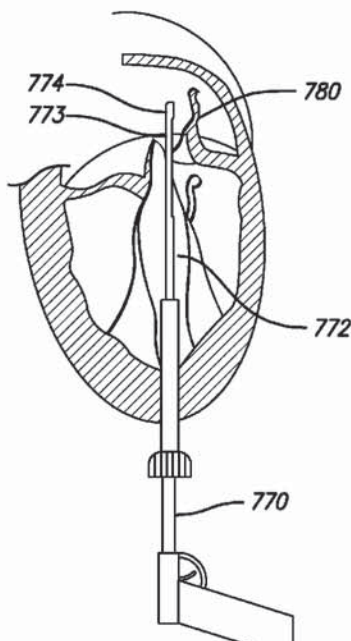
The present invention is directed to methods and devices for repairing a cardiac valve. Generally, the methods involve a minimally invasive procedure that includes creating an access in the apex region of the heart through which one or more instruments may be inserted so as to repair a cardiac valve, for instance, a mitral or tricuspid valve. Accordingly, the methods are useful for performing a variety of procedures to effectuate a repair. For instance, in one embodiment, the methods are useful for repairing a cardiac valve by implanting one or more artificial heart valve chordae tendinae into one or more cardiac valve leaflet tissues so as to restore the proper leaflet function and thereby prevent reperfusion. In another embodiment, the methods are useful for repairing a cardiac valve by resecting a portion of one or more cardiac valve leaflets and implanting one or more sutures into the resected valve tissues, which may also include the implantation of an annuloplasty ring. In an additional embodiment, the methods are useful for performing an edge to edge bow-tie repair (e.g., an Alfieri repair) on cardiac valve tissues. Devices for performing the methods of the invention are also provided.

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**23 Claims, 9 Drawing Sheets**



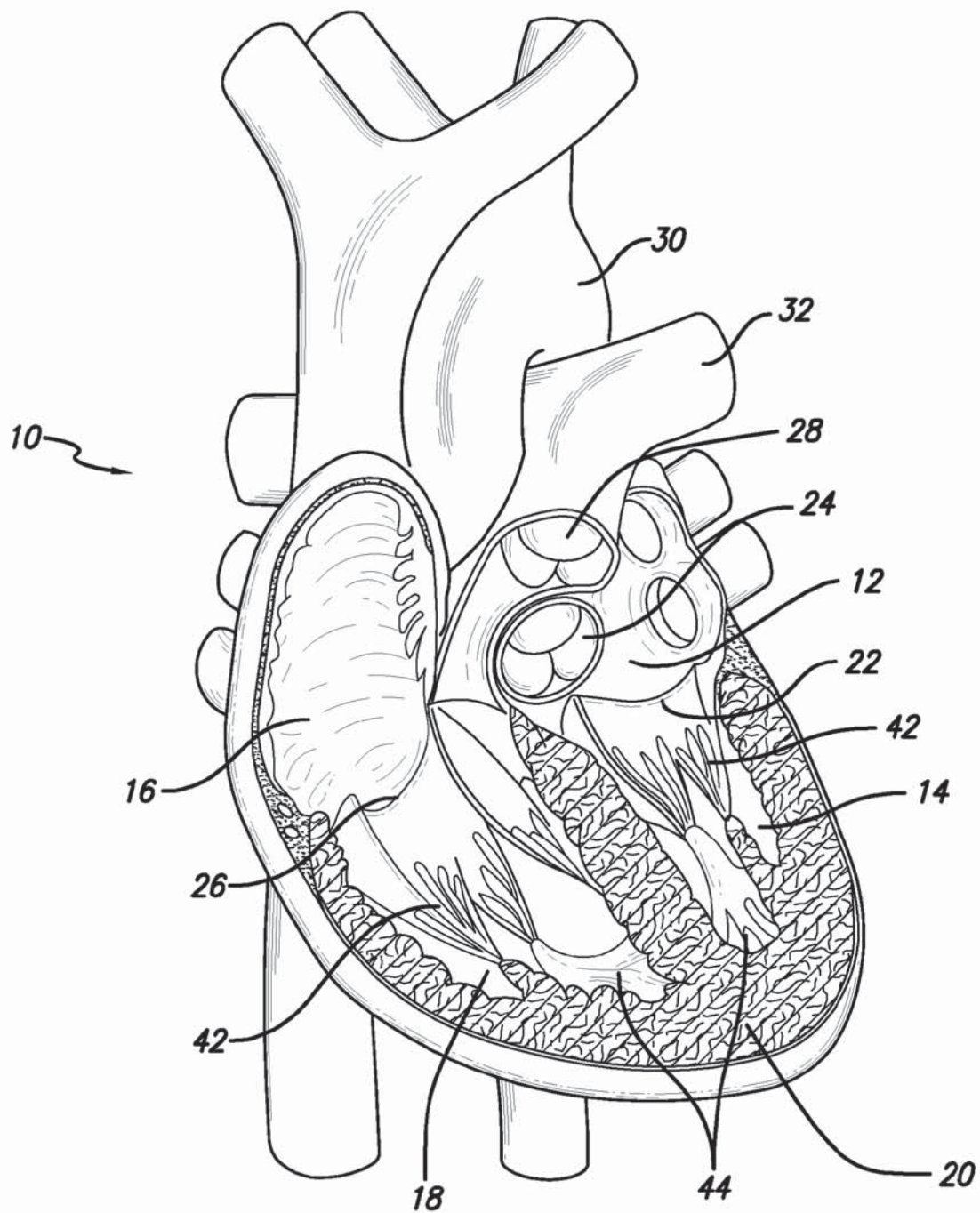


FIG. 1

FIG. 2

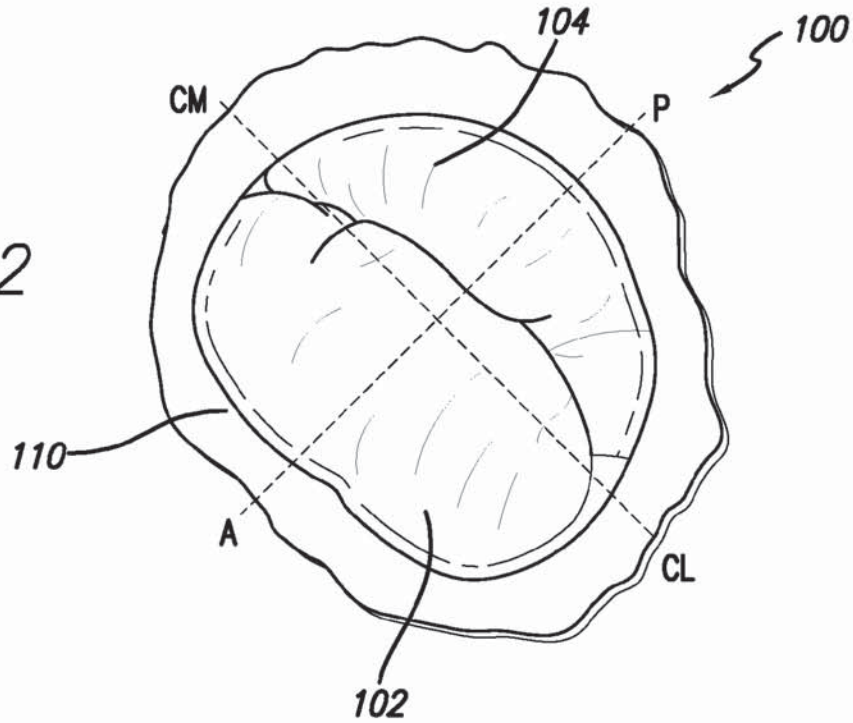
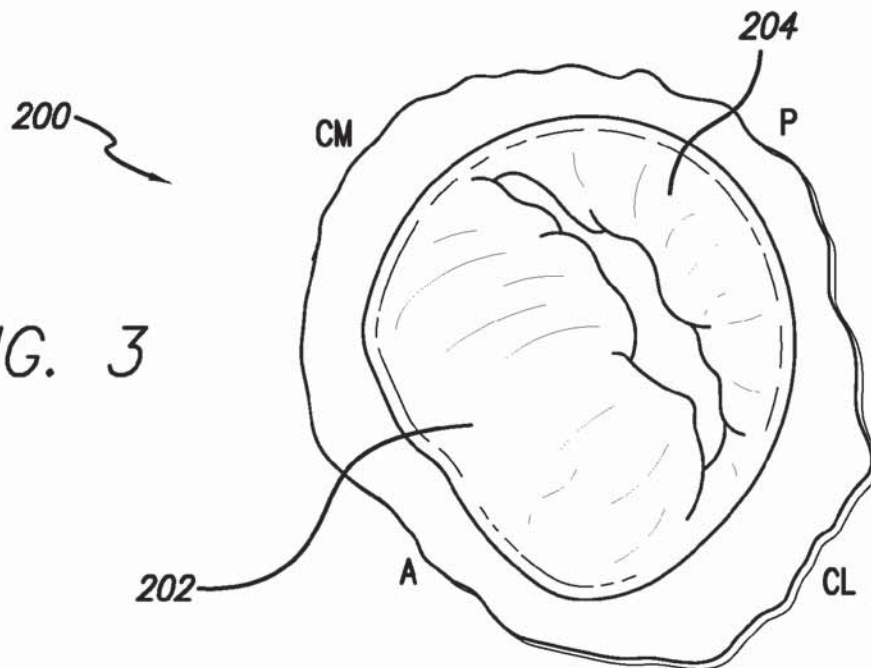


FIG. 3



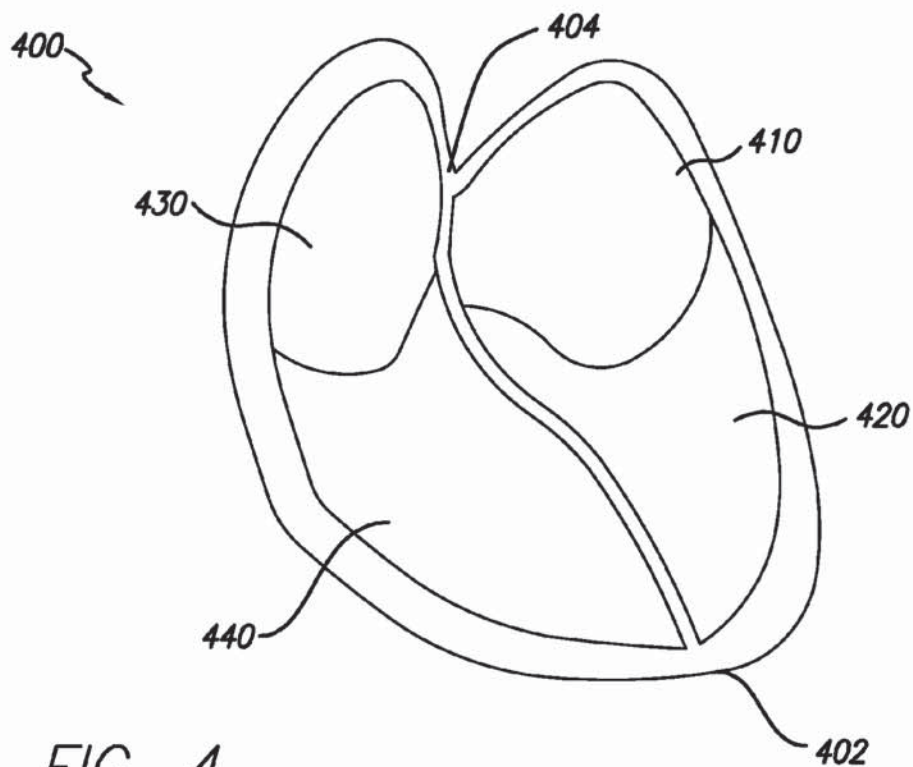


FIG. 4

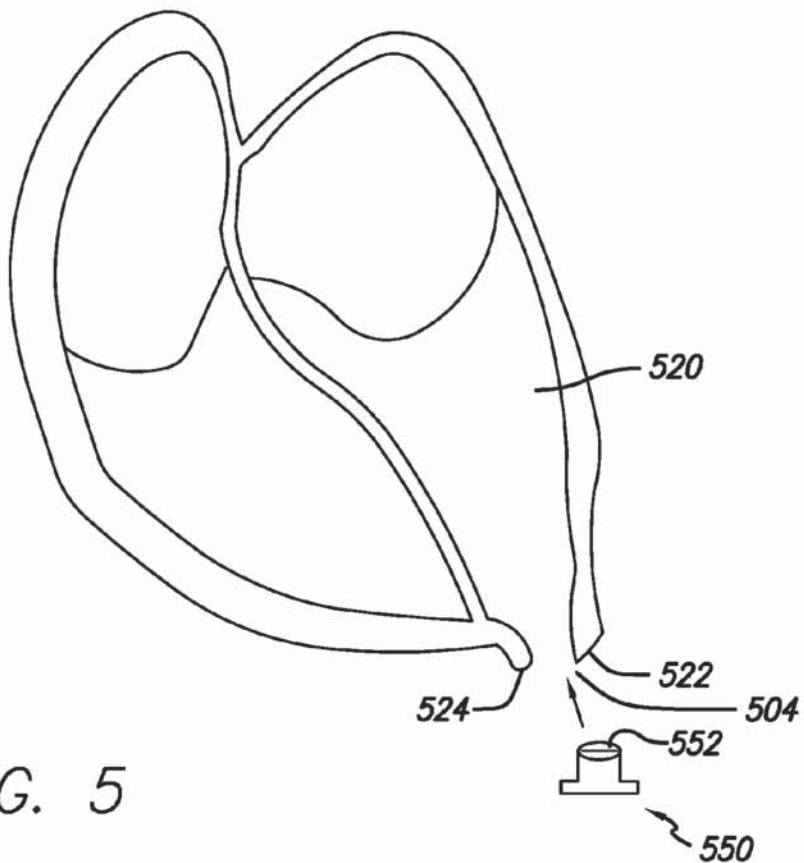
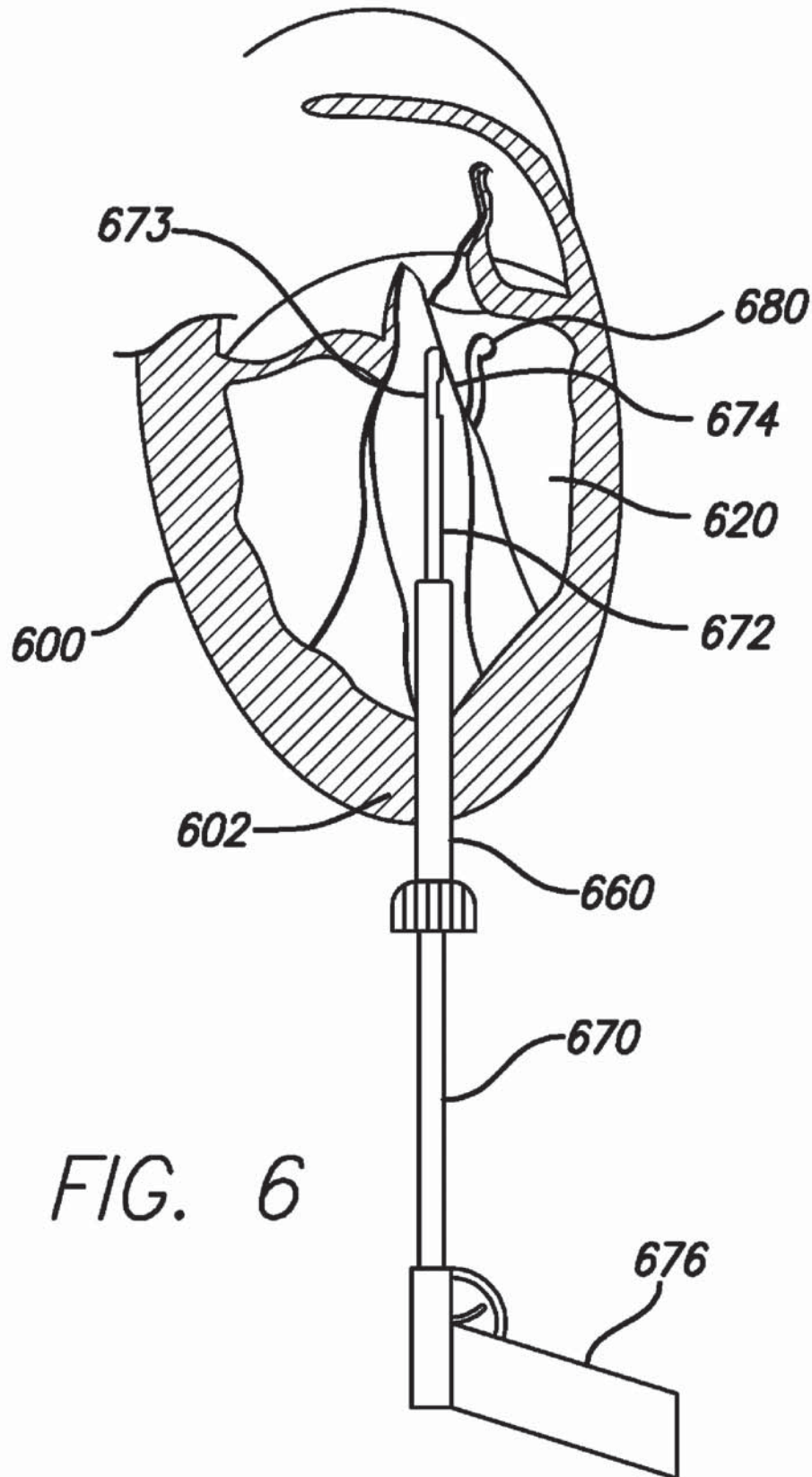


FIG. 5





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