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(12) **United States Patent**  
**Austin**

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(54) **APPARATUS FOR CONTRACTING,  
LOADING OR CRIMPING  
SELF-EXPANDING AND BALLOON  
EXPANDABLE STENT DEVICES**

(75) Inventor: **Michael Austin, Co. Galway (IE)**

(73) Assignee: **Boston Scientific SciMed, Inc., Maple  
Grove, MN (US)**

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patent is extended or adjusted under 35  
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2001, now Pat. No. 6,823,576, which is a continuation of  
application No. 09/401,218, filed on Sep. 22, 1999, now Pat.  
No. 6,360,577.

(51) **Int. Cl.**<sup>7</sup> ..... **B23P 21/00; B23P 11/00**

(52) **U.S. Cl.** ..... **29/722; 29/516; 29/508;  
72/402**

(58) **Field of Search** ..... 29/283.15, 751,  
29/516, 237, 243, 517, 508, 283.5; 72/402;  
606/1

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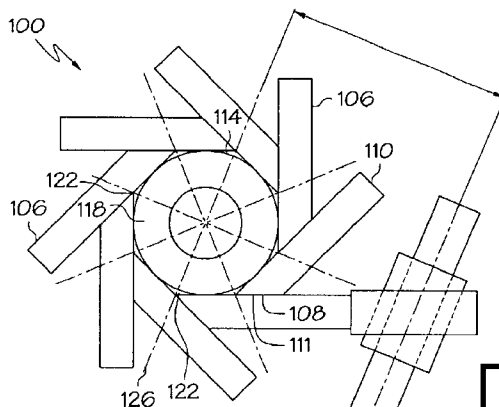
*Primary Examiner*—Marc Jimenez

(74) *Attorney, Agent, or Firm*—Vidas, Arrett & Steinkraus

(57) **ABSTRACT**

An apparatus for manipulating a medical device is formed of at least three coupled movable blades which are disposed about a reference circle to form an aperture whose size may be varied. The aperture capable of being sized to contain a medical device. Each blade is in communication with an actuation device which is capable of moving the blade to alter the size of the aperture. Each blade includes a single radial point which a) lies on the circumference of the reference circle prior to movement of the blade, and b) may be moved only along a radius of the reference circle on movement of the blade.

**40 Claims, 15 Drawing Sheets**



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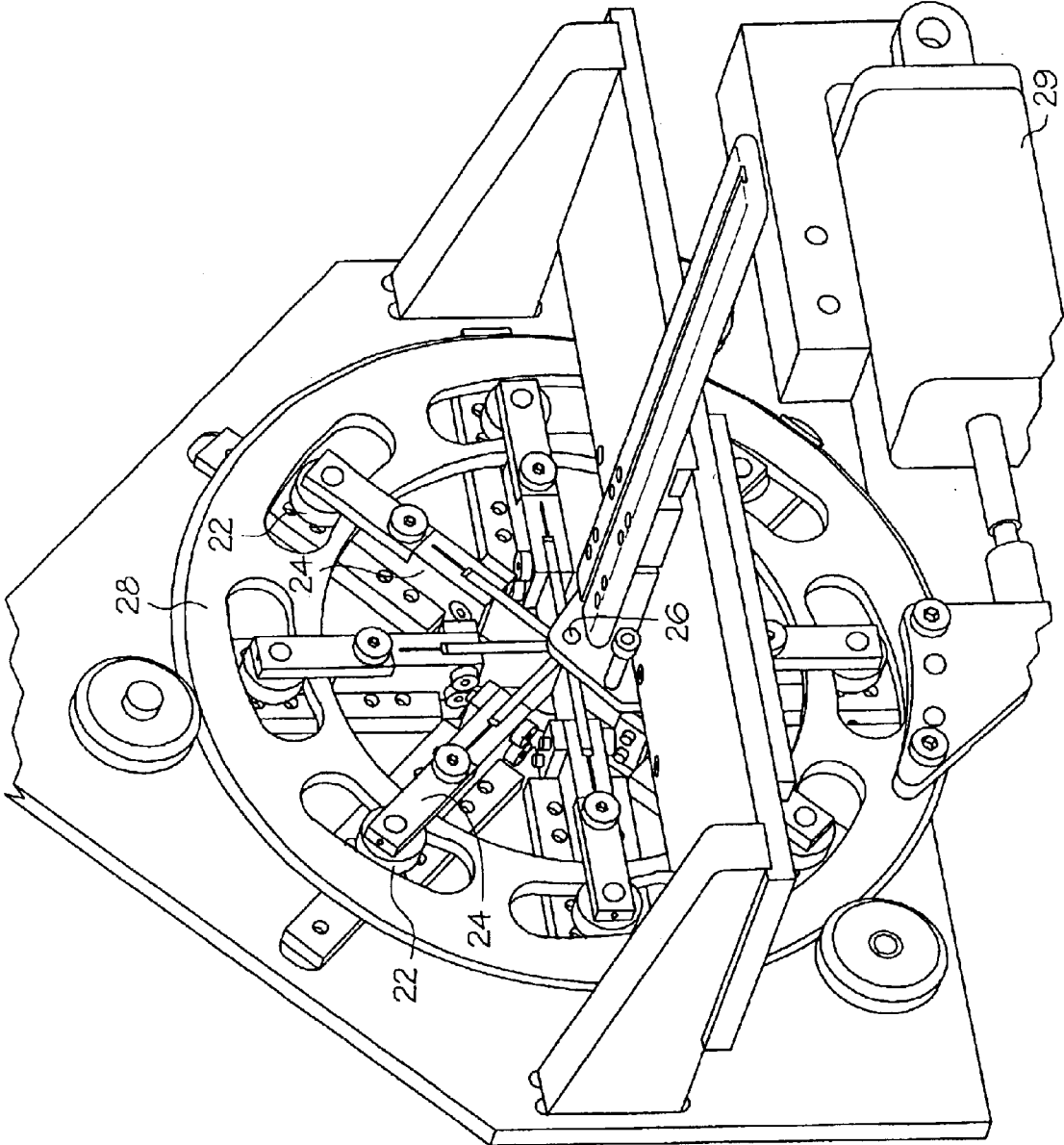


FIG. 1  
PRIOR ART

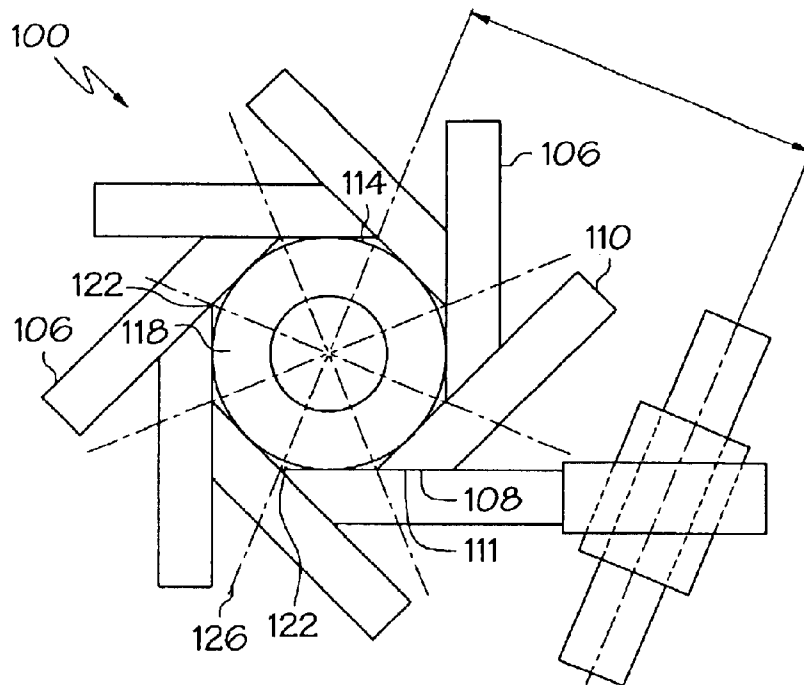


FIG. 2a

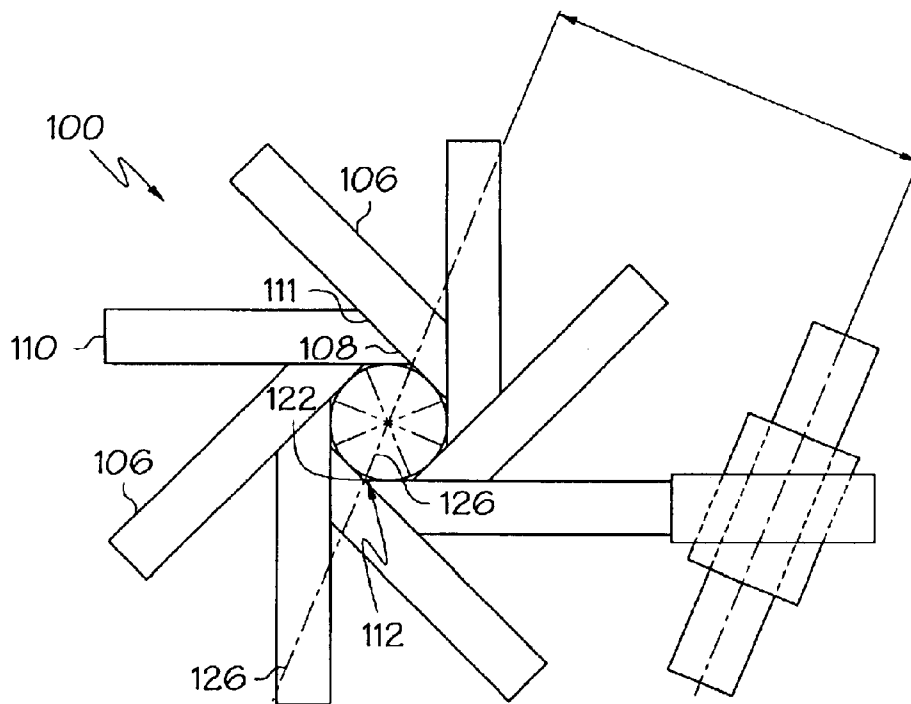


FIG. 2b

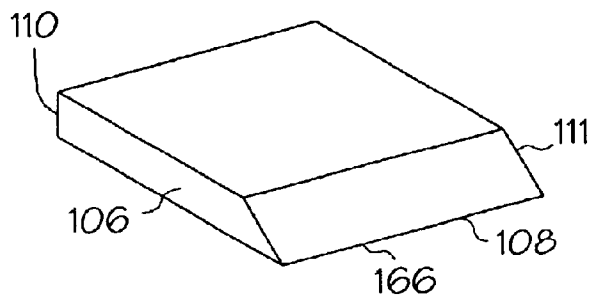


FIG. 3a

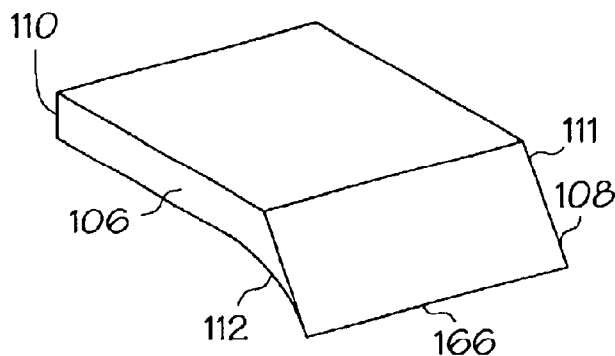


FIG. 3b

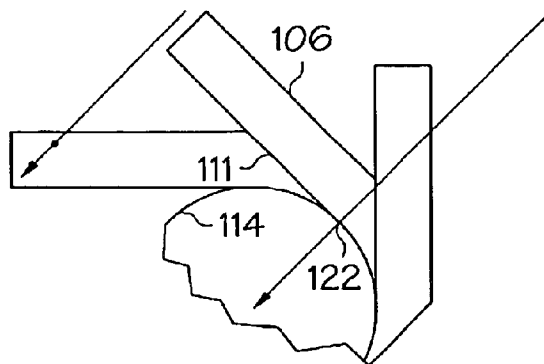


FIG. 3c

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