



US00D834193S

(12) **United States Design Patent** (10) **Patent No.:** **US D834,193 S**  
**Erzberger et al.** (45) **Date of Patent:** **\*\* Nov. 20, 2018**

(54) **SURGICAL STENT**

FOREIGN PATENT DOCUMENTS

(71) Applicant: **St. Jude Medical, Cardiology Division, Inc.**, St. Paul, MN (US)

DE 19857887 A1 7/2000  
DE 10121210 A1 11/2002

(Continued)

(72) Inventors: **Gary Erzberger**, Plymouth, MN (US);  
**Yousef F. Alkhatib**, Edina, MN (US)

OTHER PUBLICATIONS

(73) Assignee: **St. Jude Medical, Cardiology Division, Inc.**, St. Paul, MN (US)

Catheter-implanted prosthetic heart valves, Knudsen, L.L., et al.,  
The International Journal of Artificial Organs, vol. 16, No. 5 1993,  
pp. 253-262.

(\*\*) Term: **15 Years**

(Continued)

(21) Appl. No.: **29/624,239**

*Primary Examiner* — Charles D Hanson

(22) Filed: **Oct. 31, 2017**

(74) *Attorney, Agent, or Firm* — Lerner, David,  
Littenberg, Krumholz & Mentlik, LLP

(57) **CLAIM**

The ornamental design for a surgical stent, as shown and described.

**Related U.S. Application Data**

(62) Division of application No. 29/564,586, filed on May 13, 2016, now Pat. No. Des. 802,764.

**DESCRIPTION**

(51) **LOC (11) Cl.** ..... **24-02**

(52) **U.S. Cl.**  
USPC ..... **D24/155**

(58) **Field of Classification Search**  
USPC ..... D24/155  
CPC .... A61F 2/07; A61F 2/90; A61F 2/958; A61F 2002/016; A61F 2002/072; A61F 2002/075; A61F 2002/91541; A61F 2220/0075; A61F 2230/0069  
See application file for complete search history.

FIG. 1 is a top perspective view of another embodiment of a surgical stent showing our new design;  
FIG. 2 is a front side elevational view thereof;  
FIG. 3 is a rear side elevational view thereof;  
FIG. 4 is a right side elevational view thereof;  
FIG. 5 is a left side elevational view thereof;  
FIG. 6 is a top plan view thereof;  
FIG. 7 is a bottom plan view thereof;  
FIG. 8 is a top perspective view of another embodiment of a surgical stent showing our new design;  
FIG. 9 is a front side elevational view thereof;  
FIG. 10 is a rear side elevational view thereof;  
FIG. 11 is a right side elevational view thereof;  
FIG. 12 is a left side elevational view thereof;  
FIG. 13 is a top plan view thereof; and,  
FIG. 14 is a bottom plan view thereof.  
It is noted that the aspects shown in broken lines do not form part of the claimed design.

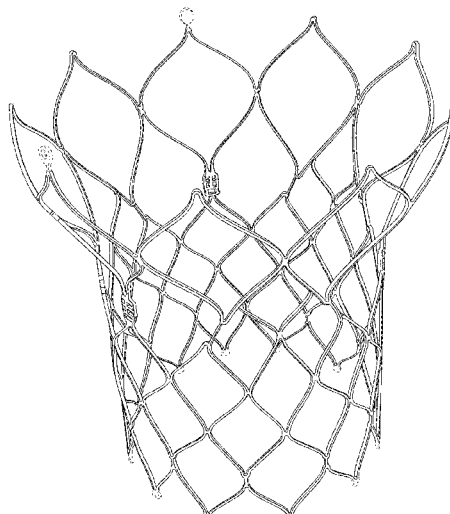
(56) **References Cited**

U.S. PATENT DOCUMENTS

4,275,469 A 6/1981 Gabbay  
4,491,986 A 1/1985 Gabbay  
4,759,758 A 7/1988 Gabbay  
4,878,906 A 11/1989 Lindemann et al.  
4,922,905 A 5/1990 Strecker  
4,994,077 A 2/1991 Dobben

(Continued)

**1 Claim, 8 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

5,411,552 A 5/1995 Andersen et al.  
 5,480,423 A 1/1996 Ravenscroft et al.  
 5,855,601 A 1/1999 Bessler et al.  
 5,935,163 A 8/1999 Gabbay  
 5,961,549 A 10/1999 Nguyen et al.  
 6,083,257 A 7/2000 Taylor et al.  
 6,090,140 A 7/2000 Gabbay  
 6,214,036 B1 4/2001 Letendre et al.  
 6,264,691 B1 7/2001 Gabbay  
 6,267,783 B1 7/2001 Letendre et al.  
 6,368,348 B1 4/2002 Gabbay  
 6,419,695 B1 7/2002 Gabbay  
 6,458,153 B1 10/2002 Bailey et al.  
 6,468,660 B2 10/2002 Ogle et al.  
 6,488,702 B1 12/2002 Besselink  
 6,517,576 B2 2/2003 Gabbay  
 6,533,810 B2 3/2003 Hankh et al.  
 6,582,464 B2 6/2003 Gabbay  
 6,610,088 B1 8/2003 Gabbay  
 6,685,625 B2 2/2004 Gabbay  
 6,719,789 B2 4/2004 Cox  
 6,730,118 B2 5/2004 Spenser et al.  
 6,783,556 B1 8/2004 Gabbay  
 6,790,230 B2 9/2004 Beyersdorf et al.  
 6,869,444 B2 3/2005 Gabbay  
 6,893,460 B2 5/2005 Spenser et al.  
 6,908,481 B2 6/2005 Cribier  
 7,025,780 B2 4/2006 Gabbay  
 7,137,184 B2 11/2006 Schreck  
 7,160,322 B2 1/2007 Gabbay  
 7,247,167 B2 7/2007 Gabbay  
 7,267,686 B2 9/2007 DiMatteo et al.  
 7,374,573 B2 5/2008 Gabbay  
 7,381,218 B2 6/2008 Schreck  
 7,452,371 B2 11/2008 Pavcnik et al.  
 7,524,331 B2 4/2009 Birdsall  
 RE40,816 E 6/2009 Taylor et al.  
 7,585,321 B2 9/2009 Cribier  
 7,731,742 B2 6/2010 Schlick et al.  
 7,846,203 B2 12/2010 Cribier  
 7,846,204 B2 12/2010 Letac et al.  
 7,914,569 B2 3/2011 Nguyen et al.  
 D648,854 S 11/2011 Braid  
 D652,926 S 1/2012 Braid  
 D652,927 S \* 1/2012 Braid ..... A61F 2/91  
 D24/155  
 D653,341 S \* 1/2012 Braid ..... A61F 2/91  
 D24/155  
 D653,342 S 1/2012 Braid et al.  
 D653,343 S 1/2012 Ness et al.  
 D654,169 S 2/2012 Braid  
 D654,170 S 2/2012 Braid et al.  
 D660,432 S 5/2012 Braid  
 D660,433 S \* 5/2012 Braid ..... A61F 2/91  
 D24/155  
 D660,967 S \* 5/2012 Braid ..... A61F 2/91  
 D24/155  
 D684,692 S 6/2013 Braid  
 8,784,481 B2 \* 7/2014 Alkhatib ..... A61F 2/2418  
 623/2.18  
 8,986,375 B2 \* 3/2015 Garde ..... A61F 2/2403  
 623/1.26  
 D730,520 S \* 5/2015 Braid ..... D24/155  
 D730,521 S \* 5/2015 Braid ..... D24/155  
 D732,666 S \* 6/2015 Nguyen ..... A61F 2/2412  
 D24/155  
 D755,384 S \* 5/2016 Pesce ..... D24/155  
 D802,764 S \* 11/2017 Erzberger ..... D24/155  
 D802,765 S \* 11/2017 Erzberger ..... D24/155  
 D802,766 S \* 11/2017 Erzberger ..... D24/155  
 2002/0036220 A1 3/2002 Gabbay  
 2003/0023303 A1 1/2003 Palmaz et al.  
 2003/0130726 A1 7/2003 Thorpe et al.  
 2004/0049262 A1 3/2004 Obermiller et al.

2004/0093075 A1 5/2004 Kuehne  
 2005/0096726 A1 5/2005 Sequin et al.  
 2005/0256566 A1 11/2005 Gabbay  
 2006/0008497 A1 1/2006 Gabbay  
 2006/0122692 A1 6/2006 Gilad et al.  
 2006/0149360 A1 7/2006 Schwammenthal et al.  
 2006/0173532 A1 8/2006 Flagle et al.  
 2006/0178740 A1 8/2006 Stacchino et al.  
 2006/0195180 A1 8/2006 Kheradvar et al.  
 2006/0206202 A1 9/2006 Bonhoeffer et al.  
 2006/0241744 A1 10/2006 Beith  
 2006/0241745 A1 10/2006 Solem  
 2006/0259137 A1 11/2006 Artof et al.  
 2006/0265056 A1 11/2006 Nguyen et al.  
 2006/0276813 A1 12/2006 Greenberg  
 2007/0067029 A1 3/2007 Gabbay  
 2007/0093890 A1 4/2007 Eliassen et al.  
 2007/0100435 A1 5/2007 Case et al.  
 2007/0118210 A1 5/2007 Pinchuk  
 2007/0213813 A1 9/2007 Von Segesser et al.  
 2007/0233228 A1 10/2007 Eberhardt et al.  
 2007/0244545 A1 10/2007 Birdsall et al.  
 2007/0288087 A1 12/2007 Fearnot et al.  
 2008/0021552 A1 1/2008 Gabbay  
 2008/0039934 A1 2/2008 Styr  
 2008/0082164 A1 4/2008 Friedman  
 2008/0097595 A1 4/2008 Gabbay  
 2008/0114452 A1 5/2008 Gabbay  
 2008/0125853 A1 5/2008 Bailey et al.  
 2008/0140189 A1 6/2008 Nguyen et al.  
 2008/0147183 A1 6/2008 Styr  
 2008/0154355 A1 6/2008 Benichou et al.  
 2008/0154356 A1 6/2008 Obermiller et al.  
 2008/0243245 A1 10/2008 Thambar et al.  
 2008/0255662 A1 10/2008 Stacchino et al.  
 2008/0262602 A1 10/2008 Wilk et al.  
 2008/0269879 A1 10/2008 Sathe et al.  
 2009/0112309 A1 4/2009 Jaramillo et al.  
 2009/0138079 A1 5/2009 Tuval et al.  
 2010/0036484 A1 2/2010 Hariton et al.  
 2010/0049306 A1 2/2010 House et al.  
 2010/0087907 A1 4/2010 Lattouf  
 2010/0131055 A1 5/2010 Case et al.  
 2010/0168778 A1 7/2010 Braid  
 2010/0168839 A1 7/2010 Braid et al.  
 2010/0185277 A1 7/2010 Braid et al.  
 2010/0191326 A1 7/2010 Alkhatib  
 2010/0204781 A1 8/2010 Alkhatib  
 2010/0204785 A1 8/2010 Alkhatib  
 2010/0217382 A1 8/2010 Chau et al.  
 2010/0249911 A1 9/2010 Alkhatib  
 2010/0249923 A1 9/2010 Alkhatib et al.  
 2010/0256737 A1 \* 10/2010 Pollock ..... A61F 2/91  
 623/1.15  
 2011/0029072 A1 2/2011 Gabbay  
 2011/0264196 A1 \* 10/2011 Savage ..... A61F 2/2418  
 623/1.26  
 2012/0303116 A1 11/2012 Gorman, III et al.  
 2014/0194981 A1 \* 7/2014 Menk ..... A61F 2/2418  
 623/2.17  
 2014/0343670 A1 \* 11/2014 Bakis ..... A61F 2/2436  
 623/2.11  
 2015/0018944 A1 \* 1/2015 O'Connell ..... A61F 2/2427  
 623/2.42

FOREIGN PATENT DOCUMENTS

DE 202008009610 U1 12/2008  
 EP D850607 A1 7/1998  
 EP 1000590 A1 5/2000  
 EP 1360942 A1 11/2003  
 EP 1584 06 A1 10/2005  
 EP 1598031 A2 11/2005  
 FR 2847800 A1 6/2004  
 FR 2850008 A1 7/2004  
 WO 9117720 A1 11/1991  
 WO 9716133 A1 5/1997  
 WO 9832412 A2 7/1998

(56)

**References Cited**

## FOREIGN PATENT DOCUMENTS

WO	9913801	A1	3/1999
WO	2001028459	A1	4/2001
WO	D149213		7/2001
WO	0154625	A1	8/2001
WO	2001056500	A2	8/2001
WO	200176510	A2	10/2001
WO	0236048	A1	5/2002
WO	0247575	A2	6/2002
WO	2003047468	A1	6/2003
WO	2005070343	A1	8/2005
WO	06073626	A2	7/2006
WO	2010008548	A2	1/2010
WO	2010008549	A1	1/2010
WO	2010096176	A1	8/2010
WO	2010098857	A1	9/2010

## OTHER PUBLICATIONS

Transluminal Aortic Valve Placement, Moazami, Nader, et al., ASAIO Journal, 1996; 42:M381-M385.  
 Transluminal Catheter Implanted Prosthetic Heart Valves, Andersen, Henning Rud, International Journal of Angiology 7:102-106 (1998).  
 Transluminal implantation of artificial heart valves, Andersen, H. R., et al., European Heart Journal (1992) 13, 704-708.

Is It Reasonable to Treat All Calcified Stenotic Aortic Valves With a Valved Stent?, 579-584, Zegdi, Rachid, MD, PhD et al., J. of the American College of Cardiology, vol. 51, No. 5, Feb. 5, 2008.

"Direct-Access Valve Replacement", Christoph H. Huber, et al., Journal of the American College of Cardiology, vol. 46, No. 2, (Jul. 19, 2005).

"Percutaneous Aortic Valve Implantation Retrograde From the Femoral Artery", John G. Webb et al., Circulation, 2006; 113:842-850 (Feb. 6, 2006).

"Minimally invasive cardiac surgery", M. J. Mack, Surgical Endoscopy, 2006, 20:S488-S492, DOI: 10.1007/s00464-006-0110-8 (presented Apr. 24, 2006).

"Transapical Transcatheter Aortic Valve Implantation in Humans", Samuel V. Lichtenstein et al., Circulation. 2006; 114: 591-596 (Jul. 31, 2006).

"Closed heart surgery: Back to the future", Samuel V. Lichtenstein, The Journal of Thoracic and Cardiovascular Surgery, vol. 131, No. 5, pp. 941-943.

"Transapical approach for sutureless stent-fixed aortic valve implantation: experimental results"; Th. Walther et al., European Journal of Cardio-thoracic Surgery 29 (2006) 703-708 (Jan. 30, 2006).

"Transapical aortic valve implantation: an animal feasibility study"; Todd M. Dewey et al., The annals of thoracic surgery 2006; 82: 110-6 (Feb. 13, 2006).

Textbook "Transcatheter Valve Repair", 2006, pp. 165-186.

\* cited by examiner

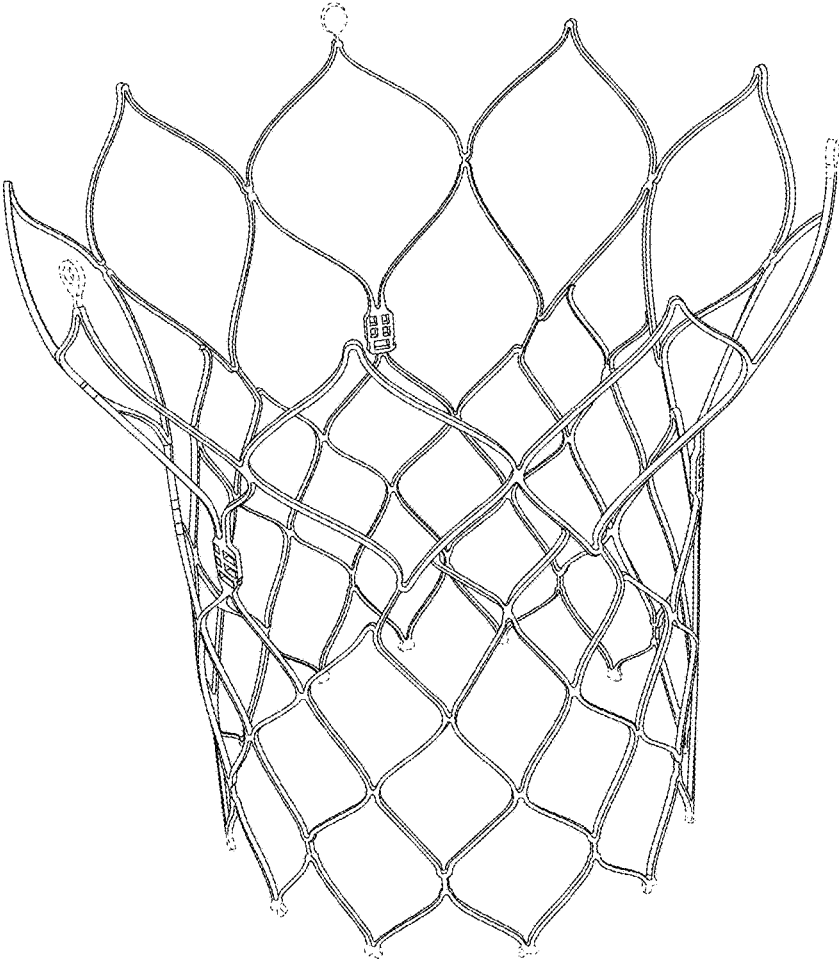


FIG. 1

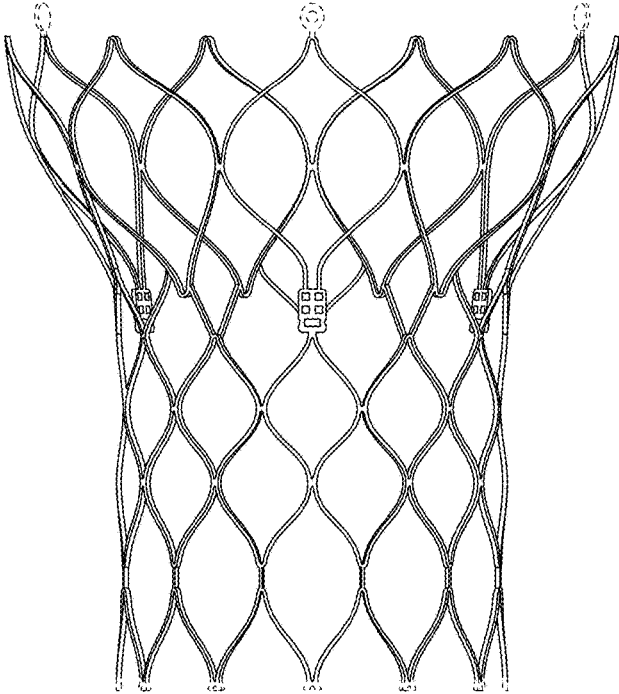


FIG. 2

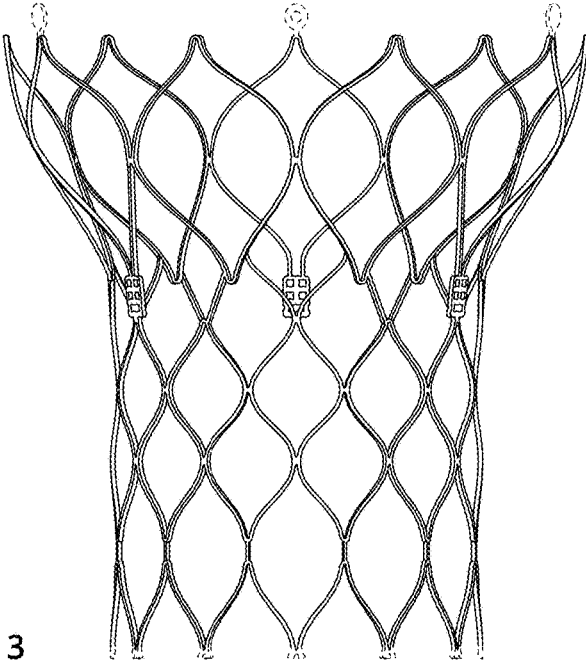


FIG. 3

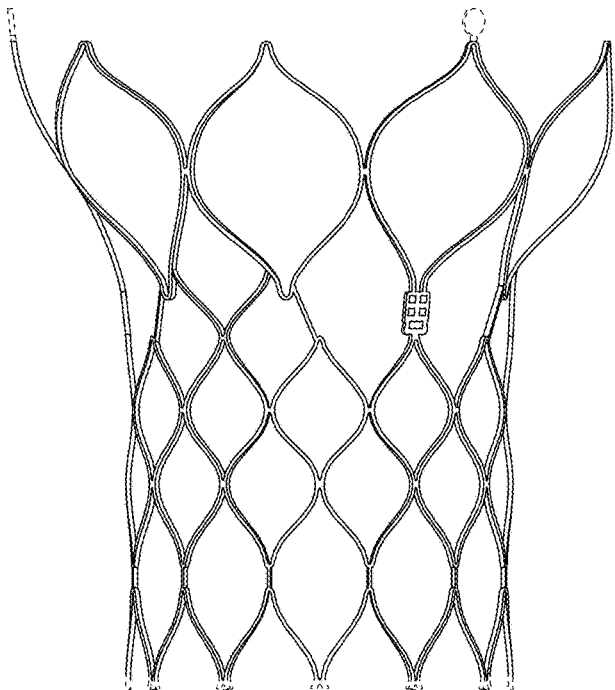


FIG. 4

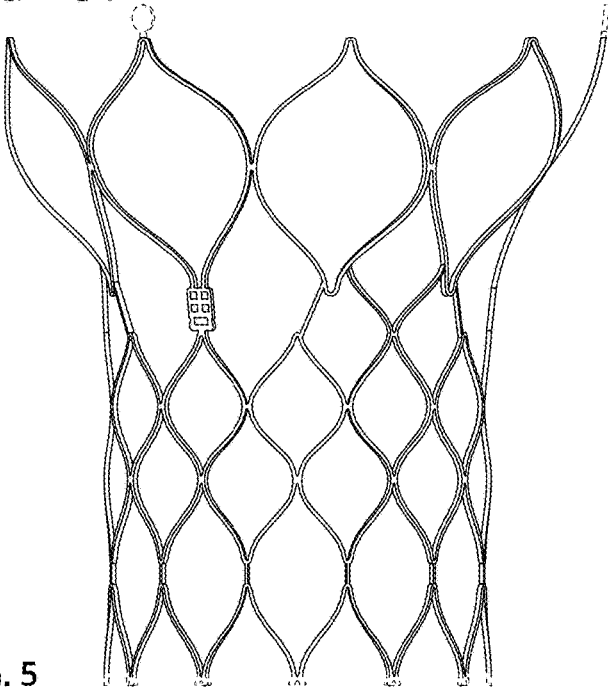


FIG. 5

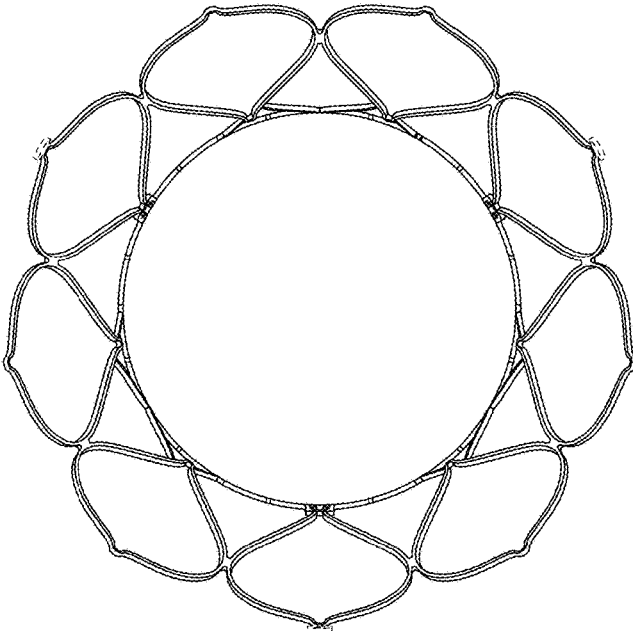


FIG. 6

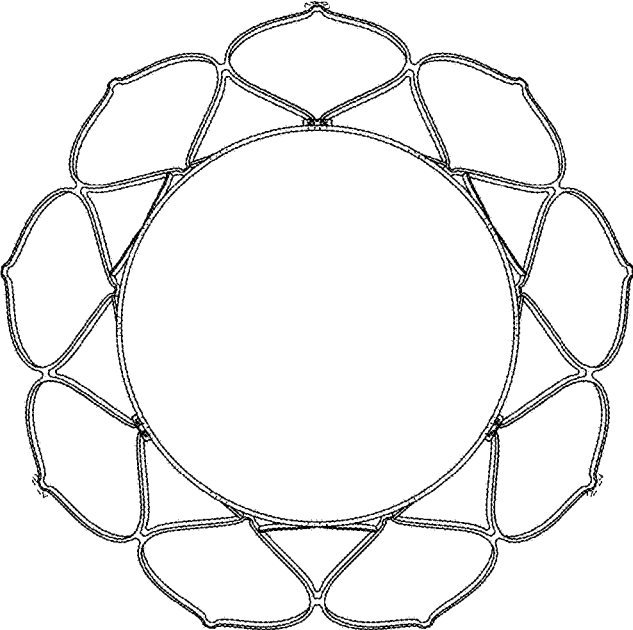


FIG. 7

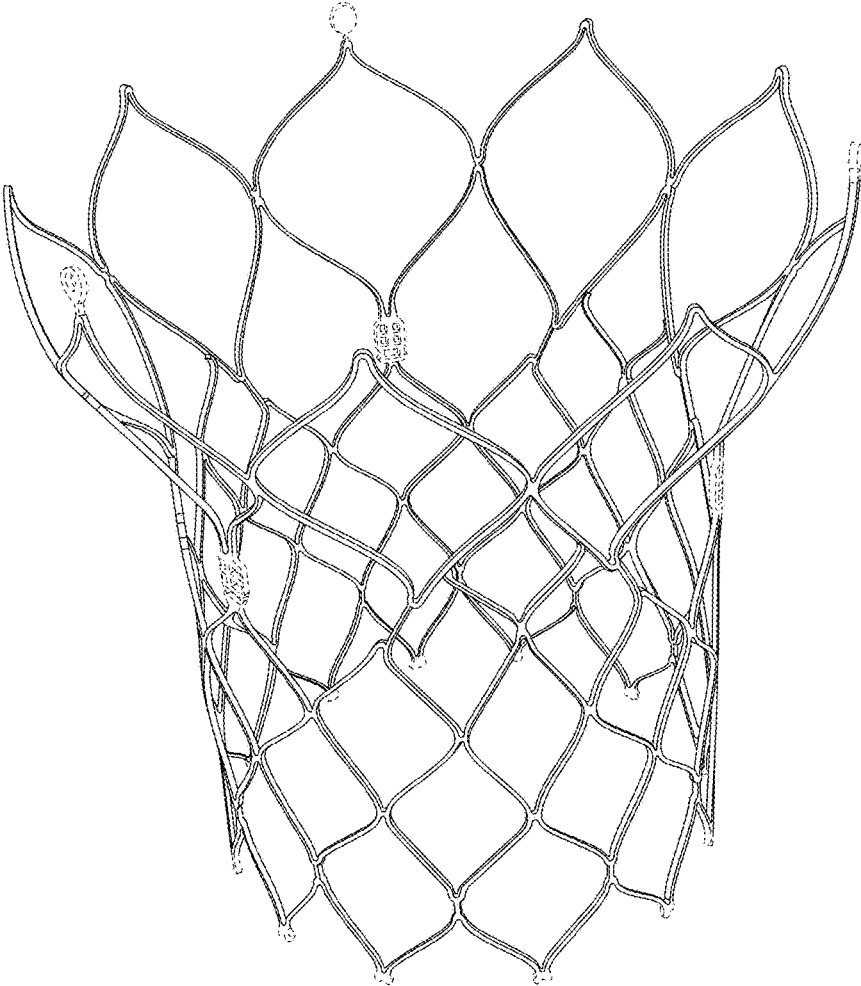


FIG. 8



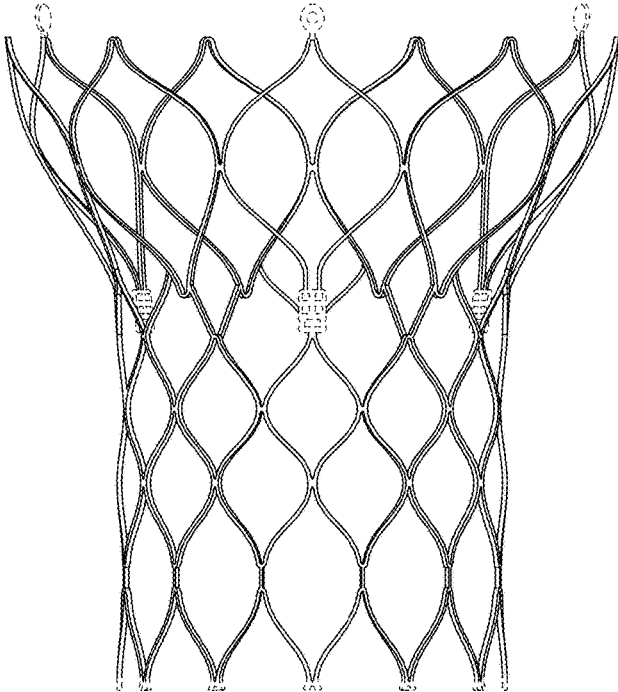


FIG. 9

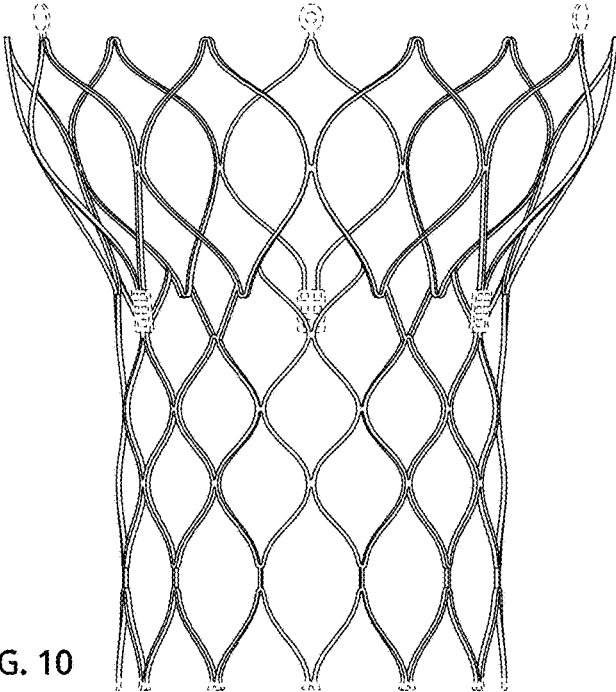


FIG. 10

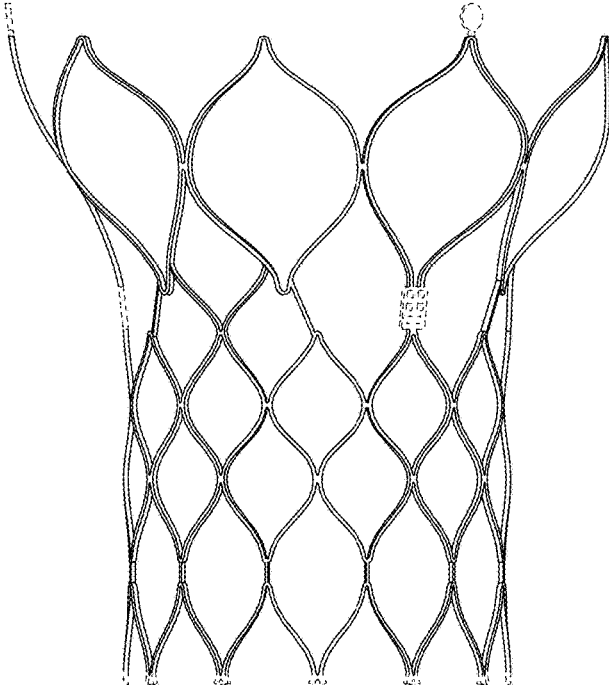


FIG. 11

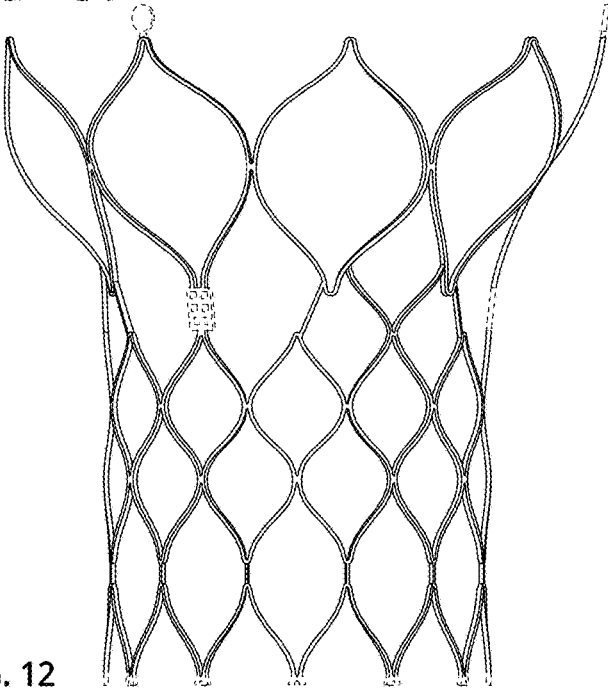


FIG. 12

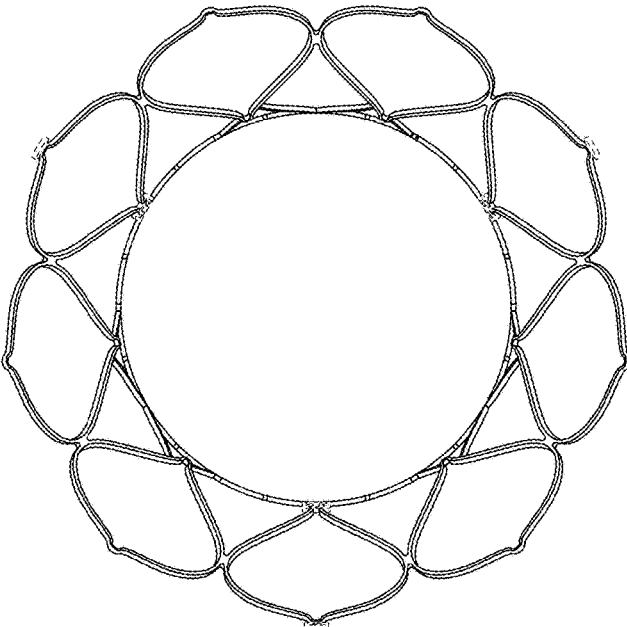


FIG. 13

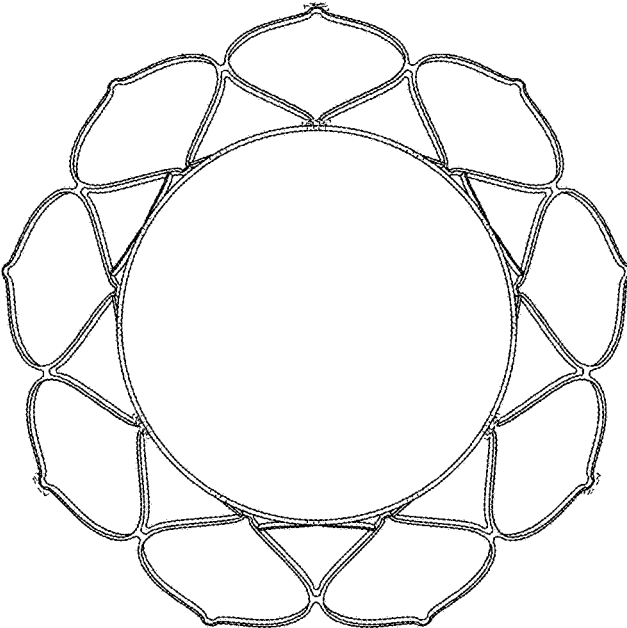


FIG. 14