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(12) **United States Design Patent**
Ding et al.

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(54) **OPEN VESSEL SEALER WITH MECHANICAL CUTTER**

D349,341 S 8/1994 Lichtman et al.
D354,564 S 1/1995 Medema
D358,887 S 5/1995 Feinberg

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(Continued)

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FOREIGN PATENT DOCUMENTS

CN 201299462 9/2009
DE 2415263 A1 10/1975

(Continued)

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OTHER PUBLICATIONS

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(Continued)

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(30) **Foreign Application Priority Data**

(57) **CLAIM**

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The ornamental design for an open vessel sealer with mechanical cutter, as shown and described.

(51) **LOC (10) Cl.** **24-02**

DESCRIPTION

(52) **U.S. Cl.**
USPC **D24/144**; D24/133; D24/147

(58) **Field of Classification Search**
USPC D24/133, 153, 143-144, 146-148;
D8/51, 52, 54; 606/45, 51, 41, 1, 46,
606/40, 167, 174

See application file for complete search history.

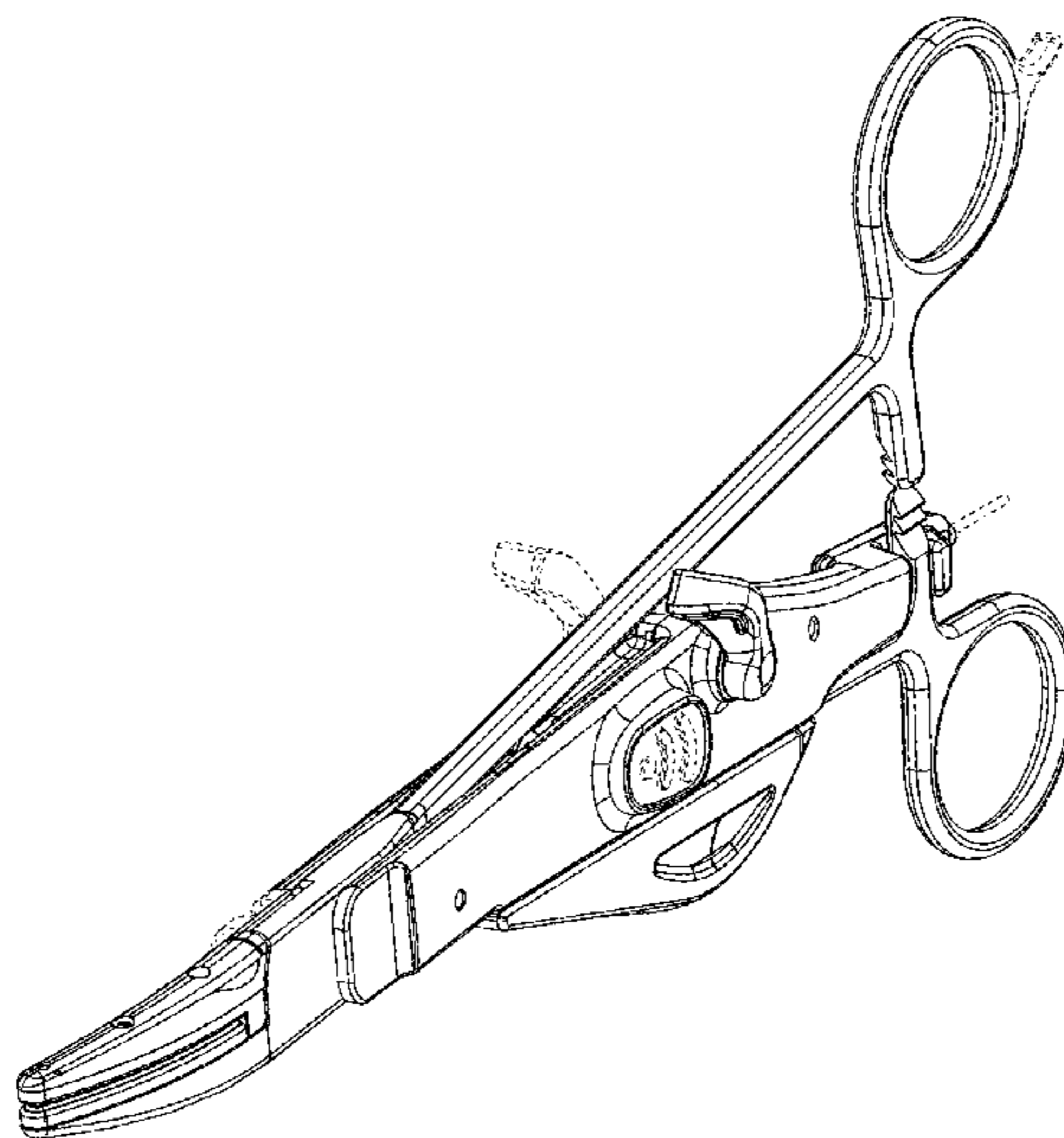
FIG. 1 is a front, perspective view of an open vessel sealer with mechanical cutter showing the new design;
FIG. 2 is a front view of the open vessel sealer with mechanical cutter of FIG. 1;
FIG. 3 is a rear view of the open vessel sealer with mechanical cutter of FIG. 1;
FIG. 4 is a left side view of the open vessel sealer with mechanical cutter of FIG. 1;
FIG. 5 is a right side view of the open vessel sealer with mechanical cutter of FIG. 1;
FIG. 6 is a top view of the open vessel sealer with mechanical cutter of FIG. 1; and,
FIG. 7 is a bottom view of the open vessel sealer with mechanical cutter of FIG. 1.
The broken lines shown in FIGS. 1-7 illustrate portions of the open vessel sealer with mechanical cutter that form no part of the claimed design.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D249,549 S 9/1978 Pike
D263,020 S 2/1982 Rau, III
4,671,274 A 6/1987 Sorochenko
D295,893 S 5/1988 Sharkany et al.
D295,894 S 5/1988 Sharkany et al.
D298,353 S 11/1988 Manno
D299,413 S 1/1989 DeCarolus
D343,453 S 1/1994 Noda
D348,930 S 7/1994 Olson

1 Claim, 7 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D384,413 S 9/1997 Zlock et al.
 H1745 H 8/1998 Paraschac
 D402,028 S 12/1998 Grimm et al.
 D408,018 S 4/1999 McNaughton
 D416,089 S 11/1999 Barton et al.
 D424,694 S 5/2000 Tetzlaff et al.
 D425,201 S 5/2000 Tetzlaff et al.
 H1904 H 10/2000 Yates et al.
 D449,886 S 10/2001 Tetzlaff et al.
 D453,923 S 2/2002 Olson
 D454,951 S 3/2002 Bon
 D457,958 S 5/2002 Dycus et al.
 D457,959 S 5/2002 Tetzlaff et al.
 H2037 H 7/2002 Yates et al.
 D465,281 S 11/2002 Lang
 D466,209 S 11/2002 Bon
 6,511,480 B1 1/2003 Tetzlaff et al.
 D493,888 S 8/2004 Reschke
 D496,997 S 10/2004 Dycus et al.
 D499,181 S 11/2004 Dycus et al.
 D502,994 S 3/2005 Blake, III
 D509,297 S 9/2005 Wells
 D525,361 S 7/2006 Hushka
 D531,311 S 10/2006 Guerra et al.
 7,131,970 B2 11/2006 Moses et al.
 D533,274 S 12/2006 Visconti et al.
 D533,942 S 12/2006 Kerr et al.
 D535,027 S 1/2007 James et al.
 7,160,299 B2 1/2007 Baily
 D538,932 S 3/2007 Malik
 D541,418 S 4/2007 Schechter et al.
 D541,611 S 5/2007 Aglassinger
 D541,938 S 5/2007 Kerr et al.
 D545,432 S 6/2007 Watanabe
 D547,154 S 7/2007 Lee
 D564,662 S 3/2008 Moses et al.
 D567,943 S 4/2008 Moses et al.
 D575,395 S 8/2008 Hushka
 D575,401 S 8/2008 Hixson et al.
 7,435,249 B2 10/2008 Buysse et al.
 D582,038 S 12/2008 Swoyer et al.
 7,641,653 B2 1/2010 Dalla Betta et al.
 7,655,007 B2 2/2010 Baily
 D617,900 S 6/2010 Kingsley et al.
 D617,901 S 6/2010 Unger et al.
 D617,902 S 6/2010 Twomey et al.
 D617,903 S 6/2010 Unger et al.
 D618,798 S 6/2010 Olson et al.
 D621,503 S 8/2010 Otten et al.
 7,811,283 B2 10/2010 Moses et al.
 D627,462 S 11/2010 Kingsley
 D628,289 S 11/2010 Romero
 D628,290 S 11/2010 Romero
 7,846,161 B2 12/2010 Dumbauld et al.
 D630,324 S 1/2011 Reschke
 7,922,718 B2 4/2011 Moses et al.
 D649,249 S 11/2011 Guerra
 D649,643 S 11/2011 Allen, IV et al.
 8,128,625 B2 3/2012 Odom
 D661,394 S 6/2012 Romero et al.
 8,211,105 B2 7/2012 Buysse et al.
 8,216,223 B2 7/2012 Wham et al.
 8,235,993 B2 8/2012 Hushka et al.
 8,241,283 B2 8/2012 Guerra et al.
 8,298,228 B2 10/2012 Buysse et al.
 D670,808 S 11/2012 Moua et al.
 8,357,159 B2 1/2013 Romero
 8,394,096 B2 3/2013 Moses et al.
 D680,220 S 4/2013 Rachlin
 8,425,504 B2 4/2013 Orton et al.
 8,486,107 B2 7/2013 Hinton
 8,574,230 B2 11/2013 Romero
 8,623,017 B2 1/2014 Moses et al.
 RE44,834 E 4/2014 Dumbauld et al.
 2003/0109875 A1 6/2003 Tetzlaff et al.

2003/0181910 A1 9/2003 Dycus et al.
 2003/0199869 A1* 10/2003 Johnson et al. 606/50
 2005/0107784 A1* 5/2005 Moses et al. 606/51
 2005/0119655 A1* 6/2005 Moses et al. 606/51
 2005/0154387 A1* 7/2005 Moses et al. 606/51
 2006/0074417 A1* 4/2006 Cunningham et al. 606/51
 2006/0167452 A1* 7/2006 Moses et al. 606/51
 2007/0088356 A1 4/2007 Moses et al.
 2007/0118111 A1 5/2007 Weinberg
 2007/0156140 A1 7/2007 Baily
 2007/0260241 A1 11/2007 Dalla Betta et al.
 2008/0039836 A1 2/2008 Odom et al.
 2009/0062794 A1 3/2009 Buysse et al.
 2010/0130971 A1 5/2010 Baily
 2011/0054472 A1* 3/2011 Romero 606/51
 2011/0218530 A1* 9/2011 Reschke 606/52
 2011/0257680 A1* 10/2011 Reschke et al. 606/206
 2012/0083786 A1* 4/2012 Artale et al. 606/51
 2013/0018371 A1 1/2013 Twomey
 2013/0041370 A1* 2/2013 Unger 606/37
 2013/0103031 A1* 4/2013 Garrison 606/42
 2013/0138101 A1 5/2013 Kerr
 2014/0336635 A1* 11/2014 Hart et al. 606/41
 2015/0051599 A1* 2/2015 Joseph 606/41
 2015/0066026 A1* 3/2015 Hart et al. 606/46

FOREIGN PATENT DOCUMENTS

DE 02514501 A1 10/1976
 DE 2627679 A1 1/1977
 DE 03423356 C2 6/1986
 DE 03612646 A1 4/1987
 DE 3627221 A1 2/1988
 DE 8712328 U1 2/1988
 DE 04303882 C2 8/1994
 DE 04403252 A1 8/1995
 DE 19515914 C1 7/1996
 DE 19506363 A1 8/1996
 DE 29616210 U1 11/1996
 DE 19608716 C1 4/1997
 DE 19751106 A1 5/1998
 DE 19751108 A1 5/1999
 DE 10031773 B4 4/2000
 DE 19946527 C1 7/2001
 DE 20121161 U1 4/2002
 DE 10045375 C2 10/2002
 DE 202007009165 U1 8/2007
 DE 202007009317 U1 8/2007
 DE 202007009318 U1 8/2007
 DE 202007016233 U1 1/2008
 DE 19738457 B4 1/2009
 DE 102004026179 B4 1/2009
 DE 102008018406 B3 7/2009
 EP 1159926 A3 12/2001
 EP 1281878 A1 2/2003
 EP 1532932 5/2005
 EP 1609430 12/2005
 EP 1852079 A1 11/2007
 JP 61-501068 9/1984
 JP 6-502328 3/1992
 JP 5-5106 1/1993
 JP 05-40112 2/1993
 JP 0006030945 A 2/1994
 JP 6-121797 A 5/1994
 JP 6-285078 A 10/1994
 JP 6-511401 12/1994
 JP 06343644 A 12/1994
 JP 07265328 A 10/1995
 JP 8-56955 5/1996
 JP 08252263 A 10/1996
 JP 8-289895 A 11/1996
 JP 8-317934 A 12/1996
 JP 8-317936 A 12/1996
 JP 9-10223 C 1/1997
 JP 09000538 A 1/1997
 JP 9-122138 A 5/1997
 JP 10-24051 A 1/1998
 JP 0010000195 A 1/1998
 JP 10-155798 A 6/1998

(56)

References Cited

FOREIGN PATENT DOCUMENTS

JP	11-47149	2/1999
JP	11-47150 A	2/1999
JP	11-070124 A	3/1999
JP	11-169381 A	6/1999
JP	11-192238 A	7/1999
JP	11244298 A	9/1999
JP	2000-102545 A	4/2000
JP	2000-135222 A	5/2000
JP	2000342599 A	12/2000
JP	2000350732 A	12/2000
JP	2001008944 A	1/2001
JP	2001-29355	2/2001
JP	2001029356 A	2/2001
JP	2001-03400	4/2001
JP	2001128990 A	5/2001
JP	2001-190564 A	7/2001
JP	2002-136525 A	5/2002
JP	2002-528166 A	9/2002
JP	2003-116871 A	4/2003
JP	2003-175052 A	6/2003
JP	2003245285 A	9/2003
JP	2004-517668 A	6/2004
JP	2004-528869 A	9/2004
JP	2005-152663 A	6/2005
JP	2005-253789 A	9/2005
JP	2005312807 A	11/2005
JP	2006-015078 A	1/2006
JP	2006-501939 A	1/2006
JP	2006-095316 A	4/2006
JP	2008-054926 A	3/2008
JP	2011125195 A	6/2011
SU	401367 A1	11/1974
WO	00/24330	5/2000
WO	0036986 A1	6/2000
WO	0059392 A1	10/2000
WO	0115614 A1	3/2001
WO	0154604 A1	8/2001
WO	0245589 A3	9/2002
WO	02/080784	10/2002
WO	02/080785	10/2002
WO	02/080786	10/2002
WO	2006/021269 A1	3/2006
WO	2005110264 A3	4/2006
WO	2008/040483 A1	4/2008
WO	2011/018154 A1	2/2011

OTHER PUBLICATIONS

U.S. Appl. No. 14/065,644, filed Oct. 29, 2013; inventor: Reschke.
U.S. Appl. No. 14/098,953, filed Dec. 6, 2013; inventor: Cunningham.
U.S. Appl. No. 14/100,237, filed Dec. 9, 2013; inventor: Reschke.
U.S. Appl. No. 14/103,971, filed Dec. 12, 2013; inventor: Roy.
U.S. Appl. No. 14/105,374, filed Dec. 13, 2013; inventor: Moua.
U.S. Appl. No. 14/152,618, filed Jan. 10, 2014; inventor: Artale.
U.S. Appl. No. 14/152,690, filed Jan. 10, 2014; inventor: Hart.
U.S. Appl. No. 14/169,358, filed Jan. 31, 2014; inventor: Reschke.
U.S. Appl. No. 14/173,391, filed Feb. 5, 2014; inventor: Kharin.
U.S. Appl. No. 14/176,341, filed Feb. 10, 2014; inventor: Hart.
U.S. Appl. No. 14/177,812, filed Feb. 11, 2014; inventor: Dycus.
U.S. Appl. No. 14/182,894, filed Feb. 18, 2014; inventor: Hart.
U.S. Appl. No. 14/182,967, filed Feb. 18, 2014; inventor: Latimer.
U.S. Appl. No. 14/183,090, filed Feb. 18, 2014; inventor: Arts.
U.S. Appl. No. 14/196,066, filed Mar. 4, 2014; inventor: McCullough.
U.S. Appl. No. 14/250,180, filed Apr. 10, 2014; inventor: Guerra.
U.S. Appl. No. 14/253,017, filed Apr. 15, 2014; inventor: Orszulak.
U.S. Appl. No. 14/260,905, filed Apr. 24, 2014; inventor: Jensen.
U.S. Appl. No. 14/268,051, filed May 2, 2014; inventor: Hart.
U.S. Appl. No. 14/268,140, filed May 2, 2014; inventor: Twomey.
U.S. Appl. No. 14/273,350, filed May 8, 2014; inventor: Gilbert.
U.S. Appl. No. 14/274,445, filed May 9, 2014; inventor: Hixson.
U.S. Appl. No. 14/276,465, filed May 13, 2014; inventor: Kappus.

U.S. Appl. No. 14/282,738, filed May 20, 2014; inventor: Rachlin.
U.S. Appl. No. 14/284,618, filed May 22, 2014; inventor: Hempstead.
U.S. Appl. No. 14/286,105, filed May 23, 2014; inventor: Johnson.
U.S. Appl. No. 14/294,316, filed Jun. 3, 2014; inventor: Johnson.
U.S. Appl. No. 14/295,049, filed Jun. 3, 2014; inventor: Couture.
U.S. Appl. No. 14/295,730, filed Jun. 4, 2014; inventor: Sartor.
U.S. Appl. No. 14/295,757, filed Jun. 4, 2014; inventor: McKenna.
U.S. Appl. No. 14/297,316, filed Jun. 5, 2014; inventor: Ackley.
U.S. Appl. No. 14/297,404, filed Jun. 5, 2014; inventor: Allen.
U.S. Appl. No. 14/299,740, filed Jun. 9, 2014; inventor: Larson.
U.S. Appl. No. 14/319,869, filed Jun. 30, 2014; inventor: Cunningham.
U.S. Appl. No. 14/322,513, filed Jul. 2, 2014; inventor: Duffin.
U.S. Appl. No. 14/335,303, filed Jul. 18, 2014; inventor: Lee.
Design U.S. Appl. No. 29/481,407; inventor Ding.
Design U.S. Appl. No. 29/481,409; inventor Ding.
Michael Choti, "Abdominoperineal Resection with the LigaSure Vessel Sealing System and LigaSure Atlas 20 cm Open Instrument"; Innovations That Work, Jun. 2003.
Chung et al., "Clinical Experience of Sutureless Closed Hemorrhoidectomy with LigaSure" Diseases of the Colon & Rectum vol. 46, No. 1 Jan. 2003.
Tinkler L.F., "Combined Diathermy and Suction Forceps", Feb. 6, 1967 (Feb. 6, 1965), British Medical Journal Feb. 6, 1976, vol. 1, nr. 5431 p. 361, ISSN: 0007-1447.
Carbonell et al., "Comparison of the Gyrus PlasmaKinetic Sealer and the Valleylab LigaSure Device in the Hemostasis of Small, Medium, and Large-Sized Arteries" Carolinas Laparoscopic and Advanced Surgery Program, Carolinas Medical Center, Charlotte, NC; Date: Aug. 2003.
Peterson et al. "Comparison of Healing Process Following Ligation with Sutures and Bipolar Vessel Sealing" Surgical Technology International (2001).
"Electrosurgery: A Historical Overview" Innovations in Electrosurgery; Sales/Product Literature; Dec. 31, 2000.
Johnson et al. "Evaluation of a Bipolar Electrothermal Vessel Sealing Device in Hemorrhoidectomy" Sales/Product Literature; Jan., 2004.
E. David Crawford "Evaluation of a New Vessel Sealing Device in Urologic Cancer Surgery" Sales/Product Literature 2000.
Johnson et al. "Evaluation of the LigaSure Vessel Sealing System in Hemorrhoidectomy" American College of Surgeons (ACS) Clinical Congress Poster (2000).
Muller et al., "Extended Left Hemicolectomy Using the LigaSure Vessel Sealing System" Innovations That Work, Sep. 1999.
Kennedy et al. "High-burst-strength, feedback-controlled bipolar vessel sealing" Surgical Endoscopy (1998) 12: 876-878.
Burdette et al. "In Vivo Probe Measurement Technique for Determining Dielectric Properties At VHF Through Microwave Frequencies", IEEE Transactions on Microwave Theory and Techniques, vol. MTT-28, No. 4, Apr. 1980 pp. 414-427.
Carus et al., "Initial Experience With the LigaSure Vessel Sealing System in Abdominal Surgery" Innovations That Work, Jun. 2002.
Heniford et al. "Initial Research and Clinical Results with an Electrothermal Bipolar Vessel Sealer" Oct. 1999.
Heniford et al. "Initial Results with an Electrothermal Bipolar Vessel Sealer" Surgical Endoscopy (2000) 15:799-801.
Herman et al., "Laparoscopic Intestinal Resection With the LigaSure Vessel Sealing System: A Case Report"; Innovations That Work, Feb. 2002.
Koyle et al., "Laparoscopic Palomo Varicocele Ligation in Children and Adolescents" Pediatric Endosurgery & Innovative Techniques, vol. 6, No. 1, 2002.
W. Scott Helton, "LigaSure Vessel Sealing System: Revolutionary Hemostasis Product for General Surgery"; Sales/Product Literature 1999.
LigaSure Vessel Sealing System, the Seal of Confidence in General, Gynecologic, Urologic, and Laparoscopic Surgery; Sales/Product Literature; Apr. 2002.
Joseph Ortenberg "LigaSure System Used in Laparoscopic 1st and 2nd Stage Orchiopexy" Innovations That Work, Nov. 2002.

(56)

References Cited

OTHER PUBLICATIONS

Sigel et al. "The Mechanism of Blood Vessel Closure by High Frequency Electrocoagulation" *Surgery Gynecology & Obstetrics*, Oct. 1965 pp. 823-831.

Sampayan et al, "Multilayer Ultra-High Gradient Insulator Technology" *Discharges and Electrical Insulation in Vacuum*, 1998. Netherlands 17-21 Aug. 1998; vol. 2, pp. 740-743.

Paul G. Horgan, "A Novel Technique for Parenchymal Division During Hepatectomy" *The American Journal of Surgery*, vol. 181, No. 3, Apr. 2001 pp. 236-237.

Benaron et al., "Optical Time-Of-Flight and Absorbance Imaging of Biologic Media", *Science, American Association for the Advancement of Science*, Washington, DC, vol. 259, Mar. 5, 1993, pp. 1463-1466.

Olsson et al. "Radical Cystectomy in Females" *Current Surgical Techniques in Urology*, vol. 14, Issue 3, 2001.

Palazzo et al. "Randomized clinical trial of Ligasure versus open haemorrhoidectomy" *British Journal of Surgery* 2002, 89, 154-157.

Levy et al. "Randomized Trial of Suture Versus Electrosurgical Bipolar Vessel Sealing in Vaginal hysterectomy" *Obstetrics & Gynecology*, vol. 102, No. 1, Jul. 2003.

"Reducing Needlestick Injuries in the Operating Room" *Sales/Product Literature* 2001.

Bergdahl et al. "Studies on Coagulation and the Development of an Automatic Computerized Bipolar Coagulator" *J. Neurosurg*, vol. 75, Jul. 1991, pp. 148-151.

Strasberg et al. "A Phase I Study of the LigaSure Vessel Sealing System in Hepatic Surgery" *Section of HPB Surger*, Washington University School of Medicine, St. Louis MO, Presented at AHPBA, Feb. 2001.

Sayfan et al. "Sutureless Closed Hemorrhoidectomy: A New Technique" *Annals of Surgery* vol. 234 No. 1 Jul. 2001; pp. 21-24.

Levy et al., "Update on Hysterectomy—New Technologies and Techniques" *OBG Management*, Feb. 2003.

Dulemba et al. "Use of a Bipolar Electrothermal Vessel Sealer in Laparoscopically Assisted Vaginal Hysterectomy" *Sales/Product Literature*; Jan. 2004.

Sengupta et al., "Use of a Computer-Controlled Bipolar Diathermy System in Radical Prostatectomies and Other Open Urological surgery" *ANZ Journal of Surgery* (2001) 71.9 pp. 538-540.

Rothenberg et al. "Use of the LigaSure Vessel Sealing System in Minimally Invasive Surgery in Children" *Int'l Pediatric Endosurgery Group (IPEG)* 2000.

Crawford et al. "Use of the LigaSure Vessel Sealing System in Urologic Cancer Surgery" *Grand Rounds in Urology* 1999 vol. 1 Issue 4 pp. 10-17.

Craig Johnson, "Use of the LigaSure Vessel Sealing System in Bloodless Hemorrhoidectomy" *Innovations That Work*, Mar. 2000.

Levy et al. "Use of a New Energy-based Vessel Ligation Device During Vaginal Hysterectomy" *Int'l Federation of Gynecology and Obstetrics (FIGO) World Congress* 1999, Nov. 1999.

Barbara Levy, "Use of a New Vessel Ligation Device During Vaginal Hysterectomy" *FIGO* 2000, Washington, D.C.

E. David Crawford "Use of a Novel Vessel Sealing Technology in Management of the Dorsal Venous Complex" *Sales/Product Literature* 2000.

Jarrett et al., "Use of the LigaSure Vessel Sealing System for Perihilar Vessels in Laparoscopic Nephrectomy" *Sales/Product Literature* 2000.

Crouch et al. "A Velocity-Dependent Model for Needle Insertion in Soft Tissue" *MICCAI* 2005; LNCS 3750 pp. 624-632, Dated: 2005.

McLellan et al. "Vessel Sealing for Hemostasis During Pelvic Surgery" *Int'l Federation of Gynecology and Obstetrics FIGO World Congress* 2000, Washington, D.C.

McLellan et al. "Vessel Sealing for Hemostasis During Gynecologic Surgery" *Sales/Product Literature* 1999.

U.S. Appl. No. 08/926,869, filed Sep. 10, 1997; inventor: James G. Chandler.

U.S. Appl. No. 09/177,950, filed Oct. 23, 1998; inventor: Randel A. Frazier.

U.S. Appl. No. 09/387,883, filed Sep. 1, 1999; inventor: Dale F. Schmaltz.

U.S. Appl. No. 09/591,328, filed Jun. 9, 2000; inventor: Thomas P. Ryan.

U.S. Appl. No. 12/336,970, filed Dec. 17, 2008; inventor: Paul R. Sremeich.

* cited by examiner

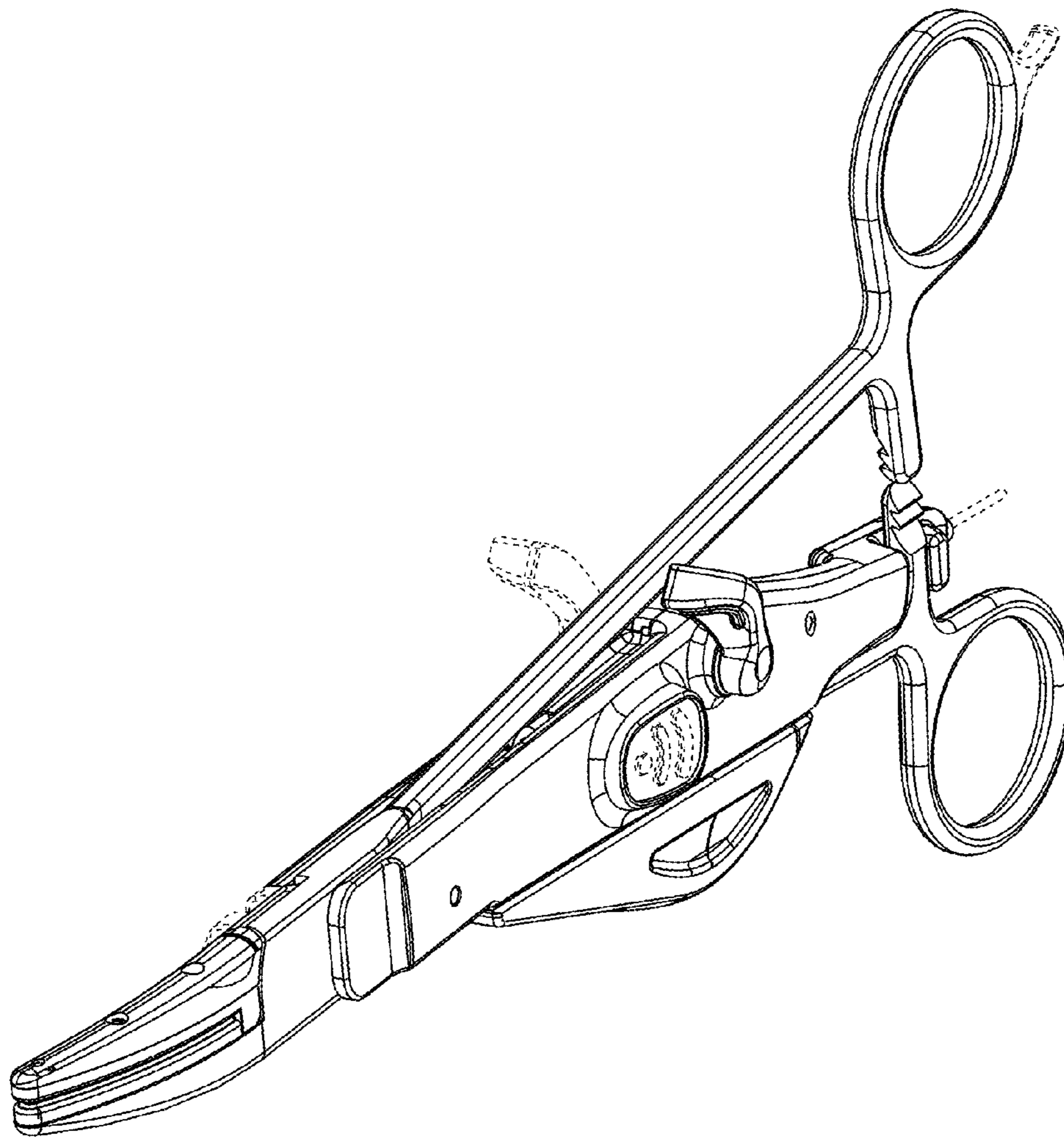


Fig. 1

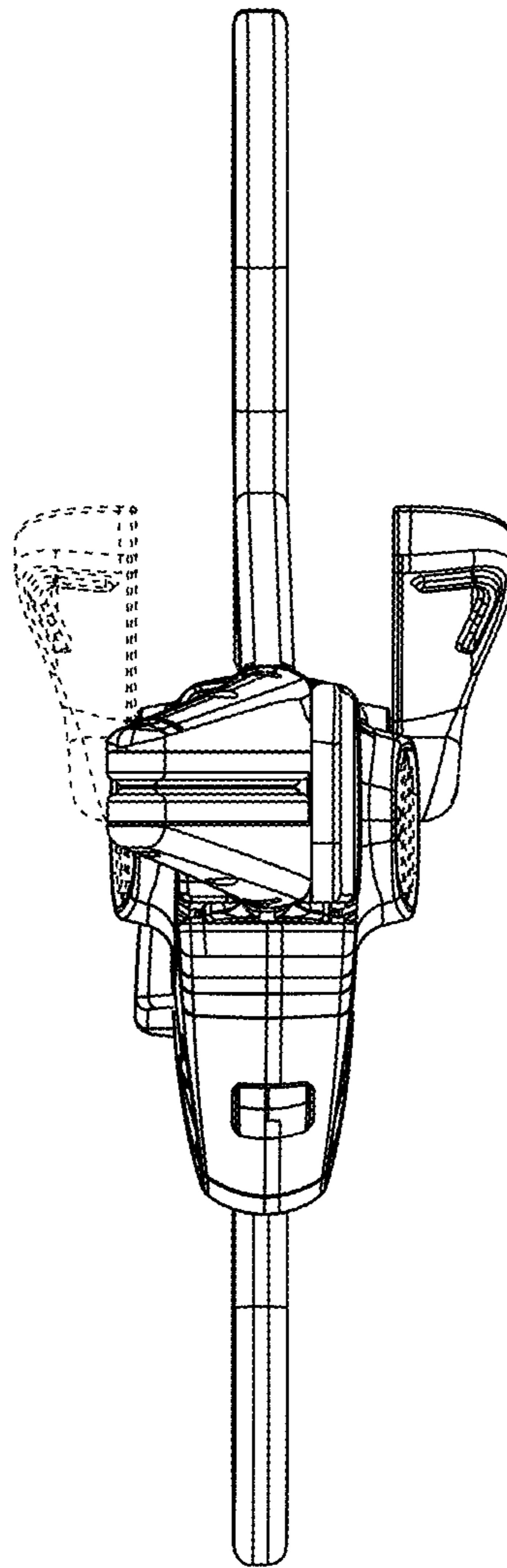


Fig. 2

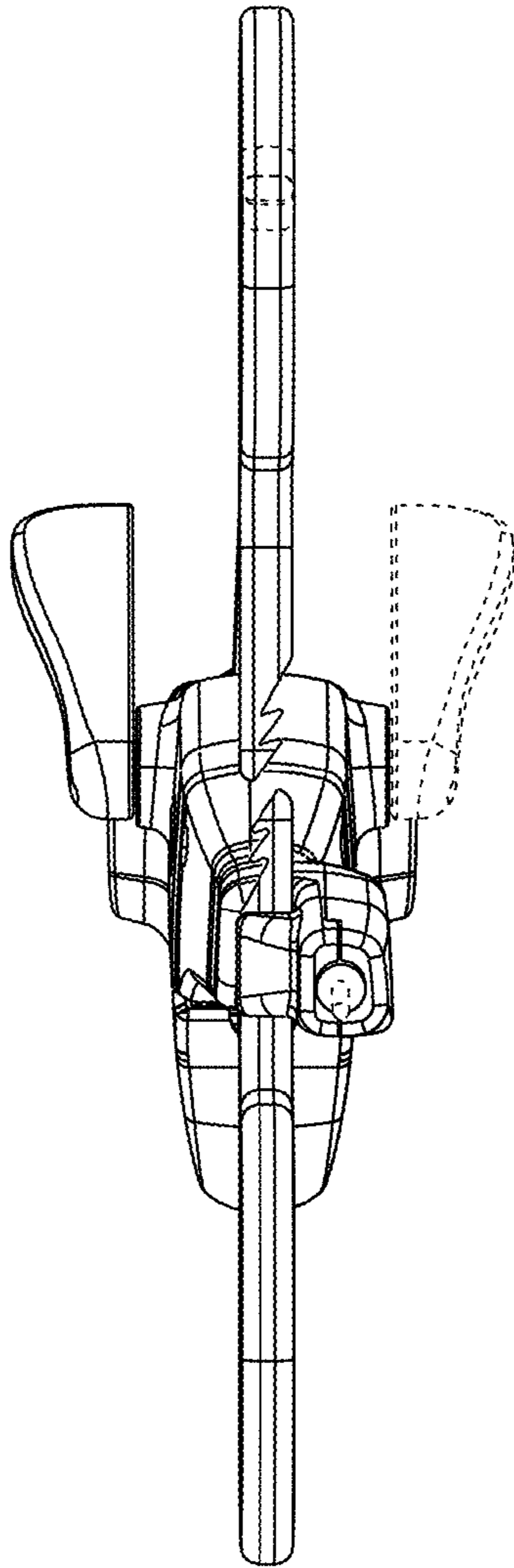


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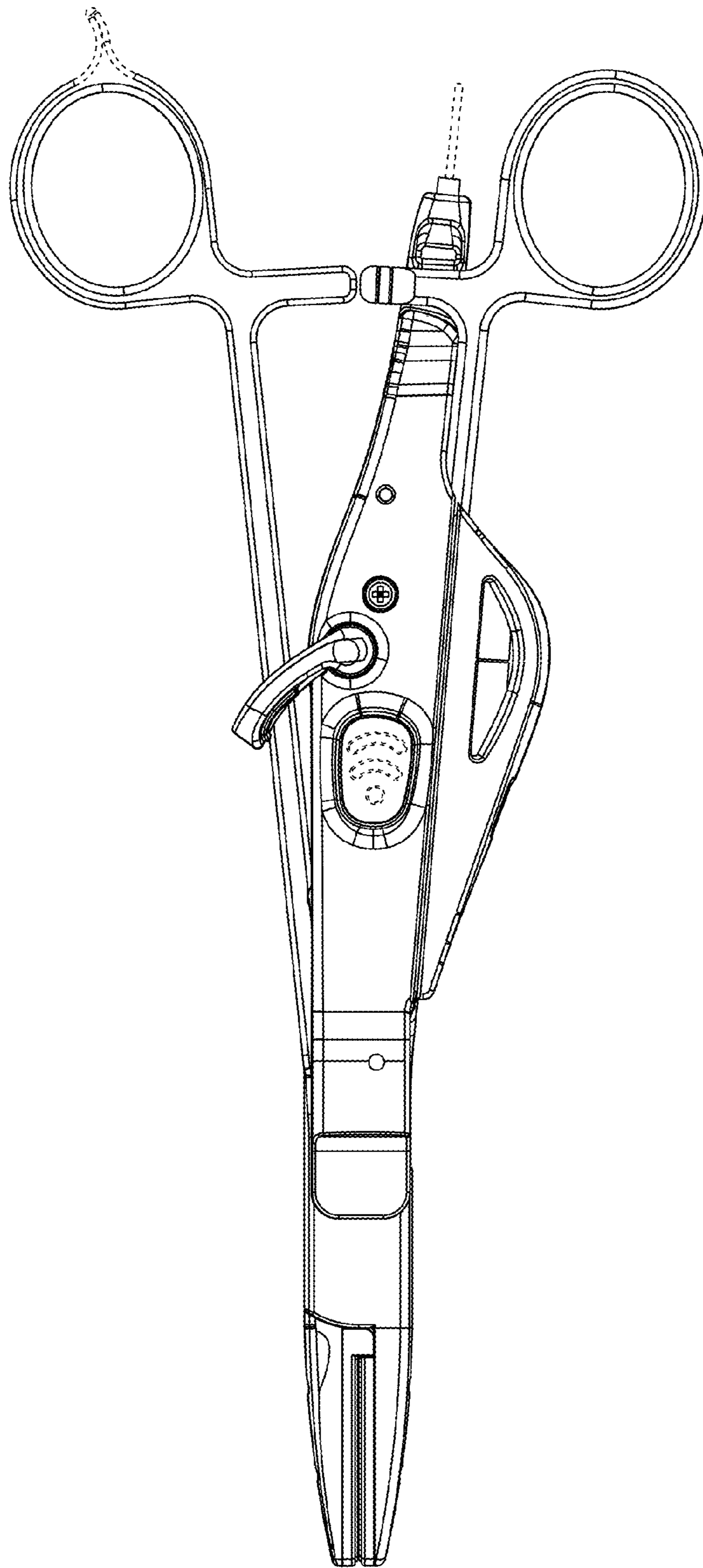


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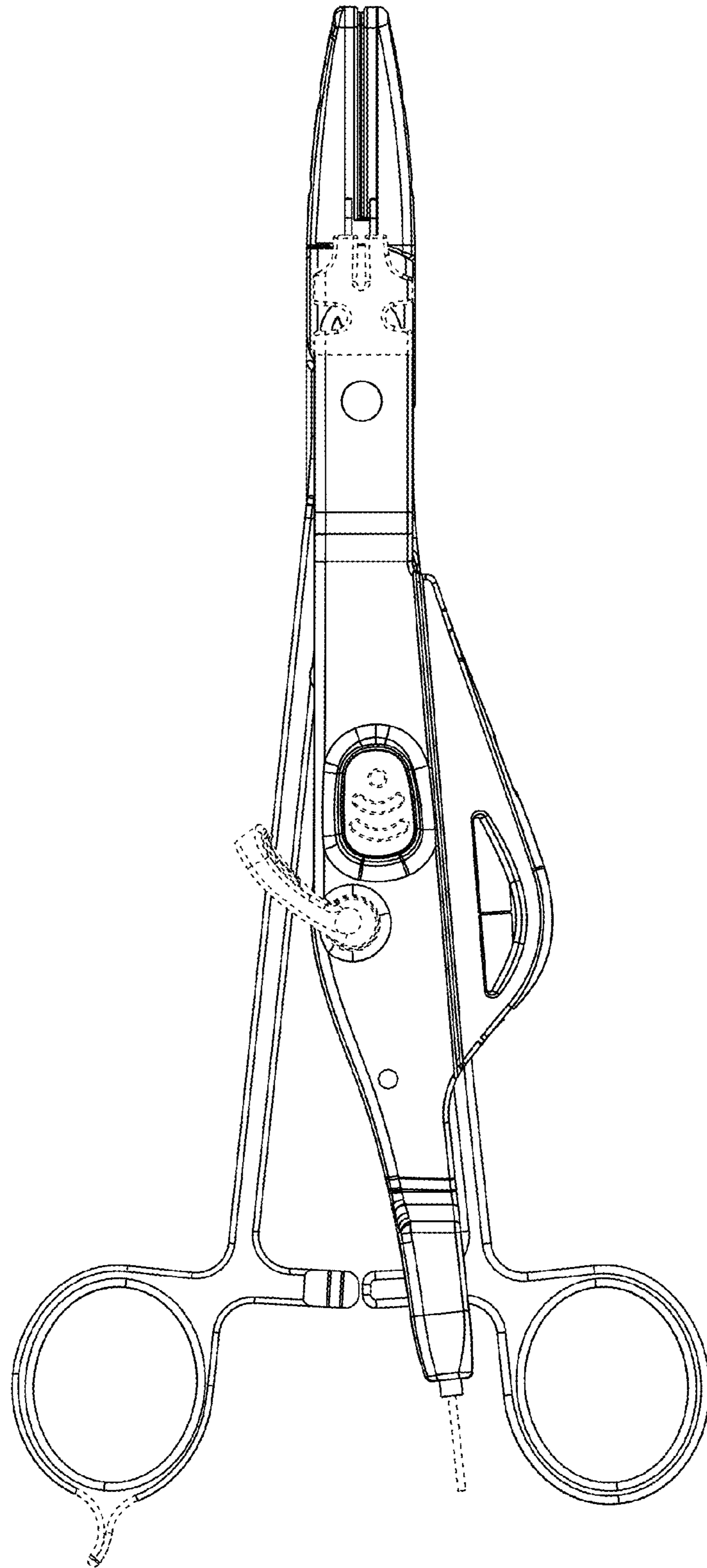


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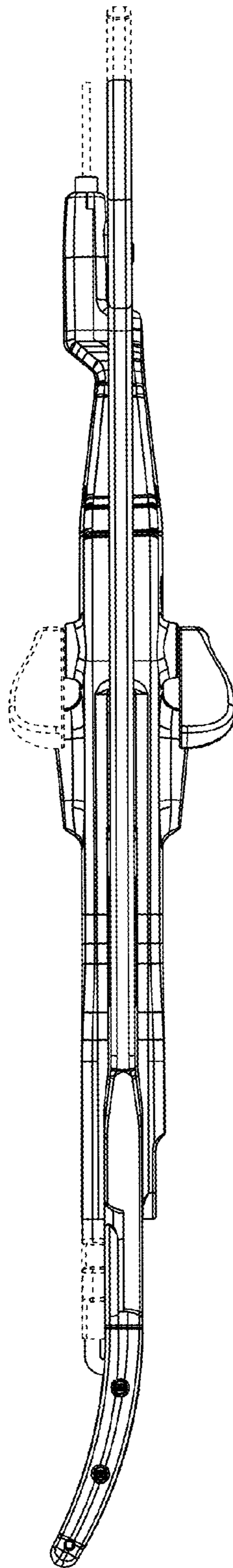


Fig. 6

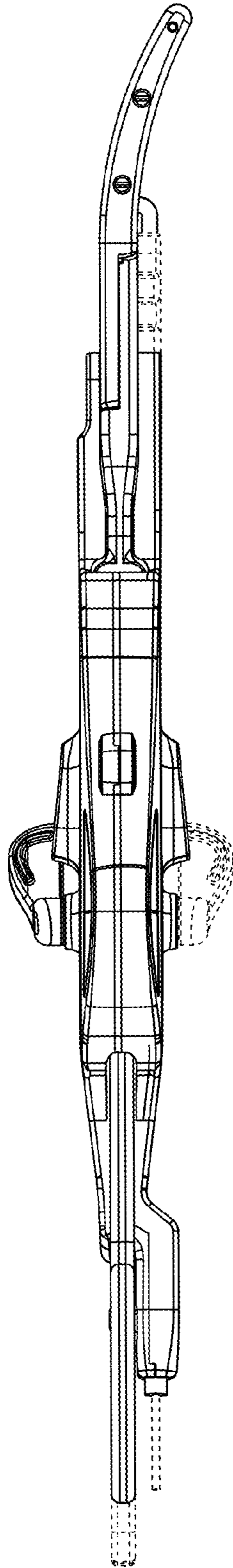


Fig. 7