

US00D871578S

(12) **United States Design Patent** (10) **Patent No.:** **US D871,578 S**
Shah et al. (45) **Date of Patent:** **** Dec. 31, 2019**

(54) **PROXIMAL HUMERAL FRACTURE PLATE**

(71) Applicants: **Anup A. Shah**, Sugar Land, TX (US);
Joshua T. Woody, Houston, TX (US)

(72) Inventors: **Anup A. Shah**, Sugar Land, TX (US);
Joshua T. Woody, Houston, TX (US)

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

(21) Appl. No.: **29/645,975**

(22) Filed: **Apr. 30, 2018**

Related U.S. Application Data

(62) Division of application No. 29/524,660, filed on Apr. 22, 2015, now Pat. No. Des. 816,840.

(51) **LOC (12) Cl.** **24-03**

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

(58) **Field of Classification Search**
USPC D24/155-157
CPC A61B 17/8061; A61B 17/7059; A61B 17/8052; A61B 17/8605; A61B 17/8085; A61B 17/809; A61B 17/8014; A61B 17/8033; A61B 17/8004; A61B 17/888; A61B 17/842; A61B 17/8023; A61B 17/8009; A61B 17/86; A61B 17/1739; A61B 17/8066; A61B 17/1671; A61B 17/1757; A61B 17/8071; A61B 17/176; A61B 2017/1782; A61B 2017/1775

See application file for complete search history.

D576,731	S *	9/2008	Strnad	.....	D24/155
D589,148	S *	3/2009	Strnad	.....	D24/155
D589,149	S *	3/2009	Strnad	.....	D24/155
7,655,029	B2	2/2010	Niederberger et al.		
7,731,718	B2	6/2010	Schwammberger et al.		
D646,785	S *	10/2011	Milford	.....	D24/155
RE43,482	E	6/2012	Mikol et al.		
D664,253	S *	7/2012	Pech	.....	D24/155
D665,082	S *	8/2012	Milford	.....	D24/155
8,287,538	B2	10/2012	Brenzel et al.		
8,337,534	B2	12/2012	Celli et al.		
D700,334	S *	2/2014	Borostyankoi	.....	D24/155
8,906,070	B2	12/2014	Medoff		
D816,840	S *	5/2018	Shah	.....	D24/155
2004/0167522	A1	8/2004	Niederberger et al.		
2005/0085818	A1 *	4/2005	Huebner	.....	A61B 17/1728 606/281
2005/0245931	A1 *	11/2005	Orbay	.....	A61B 17/1728 606/291
2007/0088360	A1 *	4/2007	Orbay	.....	A61B 17/8057 606/287
2008/0021477	A1 *	1/2008	Strnad	.....	A61B 17/8033 606/287
2009/0281578	A1	11/2009	Spencer		
2011/0224736	A1	9/2011	Humphrey		
2011/0313422	A1	12/2011	Schwager et al.		
2012/0016366	A1	1/2012	Eglseder		
2012/0136396	A1	5/2012	Baker et al.		
2012/0179208	A1	7/2012	Geissler et al.		
2012/0226323	A1	9/2012	Gonzalez-Hernandez		
2013/0096629	A1	4/2013	Rollinghof et al.		
2016/0022336	A1	1/2016	Bateman		

FOREIGN PATENT DOCUMENTS

CN	201020679245.9	U	12/2010
DE	102005043285	B3	12/2002
EP	2474278	A2	11/2012
WO	2014110421	A1	7/2014

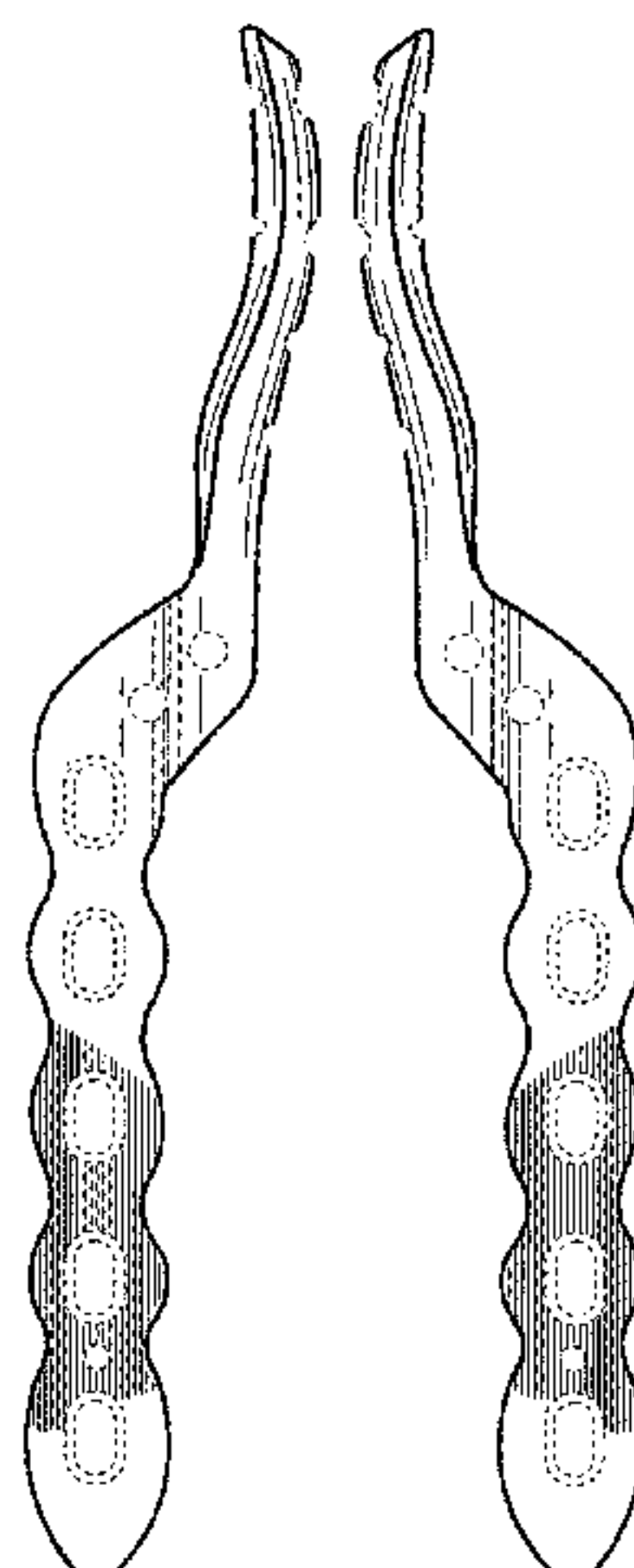
(56) **References Cited**

U.S. PATENT DOCUMENTS

4,919,670	A	4/1990	Dale et al.
5,066,296	A	11/1991	Chapman et al.
5,112,333	A	5/1992	Fixel
5,489,309	A	2/1996	Lackey et al.
5,507,517	A	4/1996	Krawczak
5,776,194	A	7/1998	Mikol et al.
6,096,040	A	8/2000	Esser
6,468,278	B1	10/2002	Muckter
7,001,388	B2	2/2006	Orbay et al.

OTHER PUBLICATIONS

Jayakumar, Prakash, et al. , A Pittfall in Fixation of Distal Humeral Fractures with Pre-Contoured Locking Plate Compression, Case Report, Apr. 2015, pp. 130-133, vol. 2015:3(2), The Archives of Bone and Joint Surgery, Mashhad University of Medical Sciences, Iranian Society of Knee Surgery, Arthroscopy and Sports Tramatology, Iranian Orthopedic Association, Mashhad, Iran.
Makins, Surgeon-General, Sir George H., K.C.M.G., C.B., F.R.C.S., The Development of British Surgery in the Hospitals on the Lines



of Communication in France, Journal, Jun. 16, 1917, pp. 789-806, vol. 2946, The British Medical Journal, London, England, United Kingdom.

Babhulkar, Sudhir, et al., Controversies in the Management of Intra-articular Fractures of the Distal Humerus in Adults, Journal, May-Jun. 2011, pp. 216-225, vol. 45(3), Indian Journal of Orthopedics, New Dehli, India.

Boulton, Christina, MD, et al., Do Locking Screws Work in Plates Bent at Holes?, Journal, Apr. 2014, pp. 189-194, vol. 28, No. 4, Journal of Orthopedic Trauma, Rosemont, Illinois, United States.

Martolla, Martta et al., Fracture of Titanium Plates Used for Mandibular Reconstruction Following Ablative Tumor Surgery, Journal, Jul. 18, 2006, pp. 345-352, Volume unknown, Wiley InterScience, Helsinki, Finland.

Sterba, William, et al., Biomechanical Analysis of Differing Pedicle Screw Insertion Angles, Journal, May 2007, pp. 385-391, vol. 22, Issue 4, Clinical Biomechanics, Bristol, Avon.

Singh Gurjinder, Dr. et al., Outcome of Precontoured Locking Plate Fixation in Distal Humerus Fractures, Journal, 2017, pp. 145-148, vol. 3, Issue 1, International Journal of Orthopaedics Sciences, Dehli, India.

Ricchetti, Eric T., et al., The Use of Precontoured Humeral Locking Plates in the Management of Displaced Proximal Humeral Fracture, Journal, 2009, pp. 582-590, vol. 17, No. 9, Journal of American Academy of Orthopedic Surgeons, Philadelphia, Pennsylvania, United States.

Gallagher, Bethany, MD, Effect of Off-Axis Screw Insertion, Insertion Torque, and Plate Contouring on Locking Screw Strength, Journal, Jul. 2014, pp. 427-432, vol. 28, No. 7, Journal of Orthopedic Trauma, Saint Louis, Missouri, United States.

Koukakis, Athanasios, et al., Fixation of Proximal Humerus Fractures Using Philos Plate: Early Experience, Journal, Jan. 2006, pp. 115-120, vol. 442, Clinical Orthopaedics and Related Research, A Publication of the Association of Bone and Joint Surgeons, Lippencott Williams and Wilkings, Philadelphia, Pennsylvania, United States.

Jabran, Ali, et al., Biomedical Analysis of Plate Systems for Proximal Humerus Fractures: A Systematic Literature Review, Biomedical Engineering Online, available online Apr. 27, 2018, pp. 1-30, 17:47, unknown city and unknown country.

Gottschalk, Andre, et al., Is Anesthesia Dangerous?, 2011, pp. 469-474, vol. 108, No. 27, Deutsches Arzteblatt International, unknown city, Federal Republic of Germany.

Zimmer Periarticular Locking Plate System Brochure, undated. Produced by Zimmer Trauma, (18 pages).

AxSOS Locking Plate System Brochure, copyrighted 2011. Produced by Stryker, (24 pages).

Fernandez, Dell'Oca, "Helical Implants," Injury, International Journal of the Care of the Injured, 33-SA-29-40, published by Elsevier Science, Inc. (2002), unknown city and/or country (12 pages).

Gardener, Michael et al., "Helical Plating of the Proximal Humerus," Injury, International Journal of the Care of the Injured, 36-1197-1200, published by Elsevier Science, Inc. (2005), unknown city and/or country (4 pages).

Hanchen, Marc et al., "Mono-versus polyaxial locking plates in distal femur fractures: a prospective randomized multicenter clinical trial," 38-857-863, International Orthopedics published online on Dec. 11, 2013, Spinger-Verlag, Berlin Heidelberg (7 pages).

Apivatthakakul, T. et al., "Danger zone for locking screw placement in minimally invasive plate osteosynthesis," Injury, International Journal of the Care of the Injured, 41-169-172, published by Elsevier Science, Inc. (2010), unknown city and/or country (4 pages).

Yang, Kyu Hyun, "Helical plate fixation for treatment of comminuted fractures of the proximal and middle one-third of the humerus," Injury, International Journal of the Care of the Injured, 36-75-80, published by Elsevier Science, Inc. (2005), unknown city and/or country (6 pages).

Tan, James Chung Hai et al., "Minimally Invasive Helical Plating for Shaft of Humerus Fractures: Technique and Outcome," The Open Orthopedics Journal, 2012, vol. 6, 184-188, published by Bentham Open 2012, unknown city and/or country (5 pages).

Apivatthakakul, T. et al., Minimally invasive plate osteosynthesis (MIPO) of the humeral shaft fracture Is it possible? A cadaveric study and preliminary report, International Journal of the Care of the Injured, 36-530-538, published by Elsevier Science, Inc. (2005), unknown city and/or country (9 pages).

Fernandez, Dell'Oca, "The principle of helical implants Unusual ideas worth considering," Injury, International Journal of the Care of the Injured, 33-SA 1 27, published by Elsevier Science, Inc. (2002), unknown city and/or country (27 pages).

Valdez, Victor, "Minimally Invasive Plate Osteosynthesis Using a Helical Plate for Metadiaphyseal Complex Fractures of the Proximal Humerus," Ortopedia Pediatrica y Cirugia Articular, published online at www.helio.com and dated Mar. 27, 2014, unknown city and/or country (9 pages).

Smith & Nephew, Peri-Loc Locked Plating System—Proximal Humerus Fracture with Shaft Extension Case Study, Produced by Smith & Nephew, Inc. copyright 2010, (4 pages).

Smith & Nephew, Peri-Loc Locked Plating System, Produced by Smith & Nephew, Inc. copyright 2014, (68 pages).

Advanced Orthopedic Solutions, Proximal Humeral Plating System, webpage printed as a PDF on Oct. 30, 2019, date: unknown, pages: n/a, volume: n/a, volume-issue number: n/a, published by Advanced Orthopedic Solutions and "Copyright Advanced Orthopedic Solutions 2018," city and/or country where published: n/a. (13 pages).

Advanced Orthopedic Solutions, Proximal Humeral Plating System, downloaded from Advanced Orthopedic Solution's website as a PDF on Oct. 30, 2019, date: unknown, pages: n/a, volume: n/a, volume-issue number: n/a, published by Advanced Orthopedic Solutions and "Copyright Advanced Orthopedic Solutions 2018 P/N 9023 Rev. B," city and/or country where published: n/a. (6 pages).

Advanced Orthopedic Solutions, Mirror Images Alpha Plate Versus the Reverse Shoulder, downloaded from Advanced Orthopedic Solution's website as a PDF on Oct. 30, 2019, date: unknown, pages: n/a, volume: n/a, volume-issue number: n/a, published by Advanced Orthopedic Solutions, city and/or country where published: n/a. (2 pages).

Advanced Orthopedic Solutions, Proximal Humeral Plating System including the PHP, 95° and Alpha Plate Systems Surgical Technique, PDF downloaded from Advanced Orthopedic Solution's website on Oct. 30, 2019, date: unknown, pages: n/a, volume: n/a, volume-issue number: n/a, published by Advanced Orthopedic Solutions and "Copyright Advanced Orthopedic Solutions 201 P/N 9023 Rev. B," city and/or country where published: n/a. (14 pages).

* cited by examiner

Primary Examiner — Charles D Hanson

(74) *Attorney, Agent, or Firm* — Malcolm E. Whittaker; Whittaker Law Firm

(57)

CLAIM

The ornamental design for the proximal humeral fracture plate, as shown and described.

DESCRIPTION

FIG. 1 is an environmental perspective view of a proximal humeral fracture plate for repairing a fracture of a patient's left humerus, screw holes disclaimed.

FIG. 2 is an anterior view of the proximal humeral fracture plate for repairing a fracture of a patient's left humerus, screw holes disclaimed.

FIG. 3 is a lateral view of the proximal humeral fracture plate for repairing a fracture of a patient's left humerus, screw holes disclaimed.

FIG. 4 is a medial view of the proximal humeral fracture plate for repairing a fracture of a patient's left humerus, screw holes disclaimed.

FIG. 5 is a posterior view of the proximal humeral fracture plate for repairing a fracture of a patient's left humerus, screw holes disclaimed.

FIG. 6 is a superior view of the proximal humeral fracture plate for repairing a fracture of a patient's left humerus, screw holes disclaimed.

FIG. 7 is an inferior view of the proximal humeral fracture plate for repairing a fracture of a patient's left humerus, screw holes disclaimed.

FIG. 8 is an environmental perspective view of a proximal humeral fracture plate for repairing a fracture of a patient's right humerus, screw holes disclaimed.

FIG. 9 is an anterior view of the proximal humeral fracture plate for repairing a fracture of a patient's right humerus, screw holes disclaimed.

FIG. 10 is a lateral view of the proximal humeral fracture plate for repairing a fracture of a patient's right humerus, screw holes disclaimed.

FIG. 11 is a medial view of the proximal humeral fracture plate for repairing a fracture of a patient's right humerus, screw holes disclaimed.

FIG. 12 is a posterior view of the proximal humeral fracture plate for repairing a fracture of a patient's right humerus, screw holes disclaimed.

FIG. 13 is a superior view of the proximal humeral fracture plate for repairing a fracture of a patient's right humerus, screw holes disclaimed; and,

FIG. 14 is an inferior view of the proximal humeral fracture plate for repairing a fracture of a patient's right humerus, screw holes disclaimed.

1 Claim, 4 Drawing Sheets

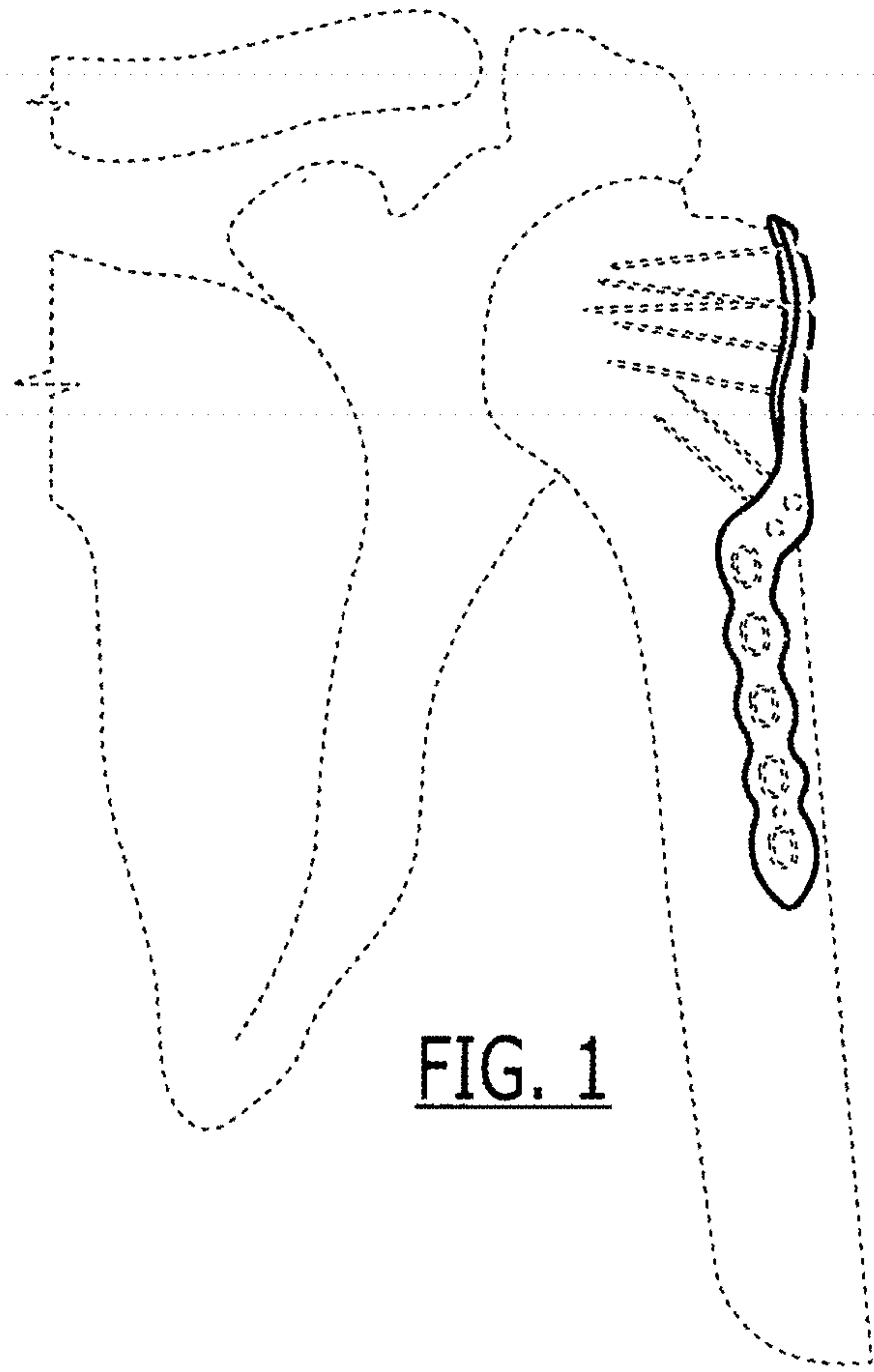


FIG. 1

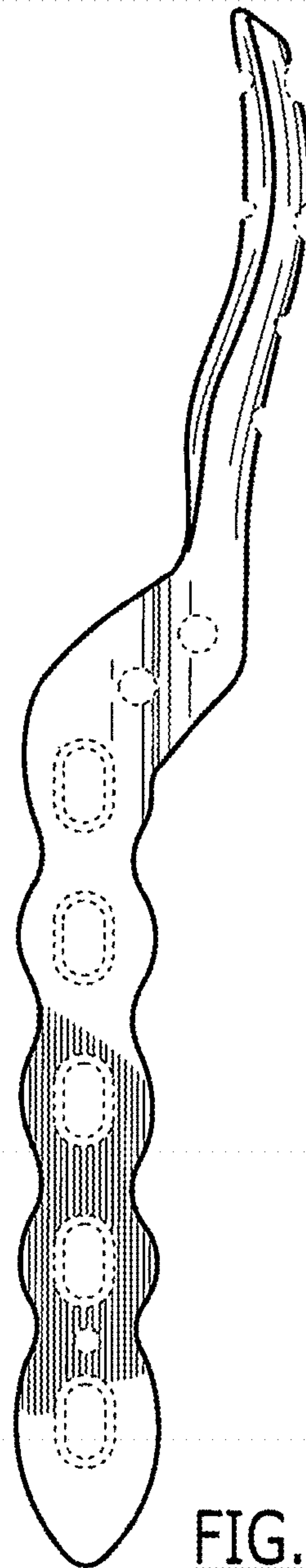


FIG. 2

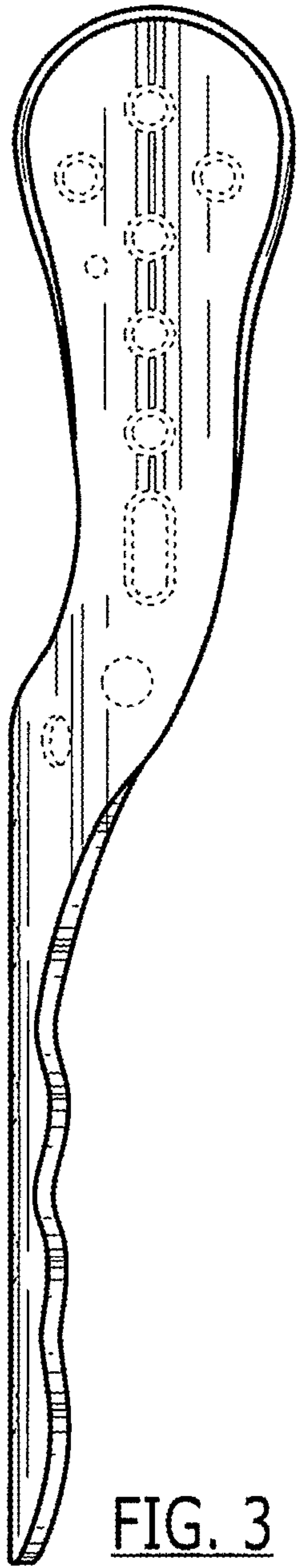


FIG. 3

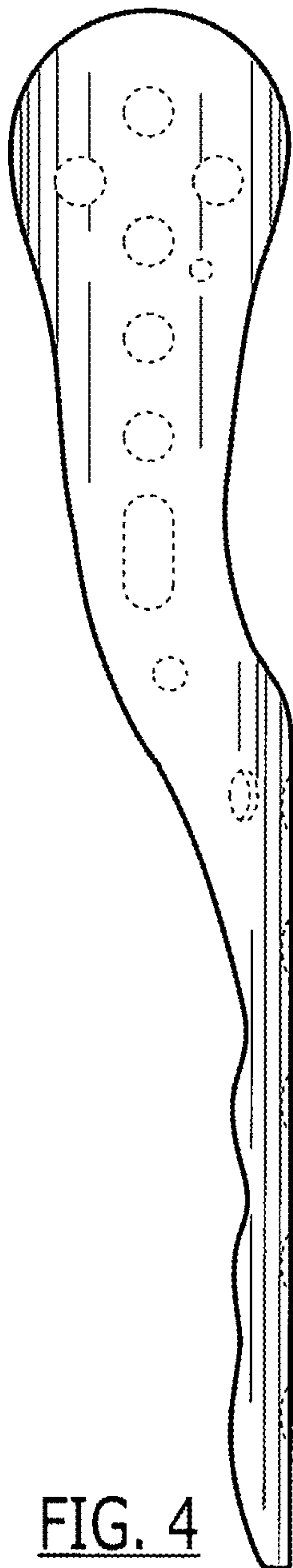


FIG. 4

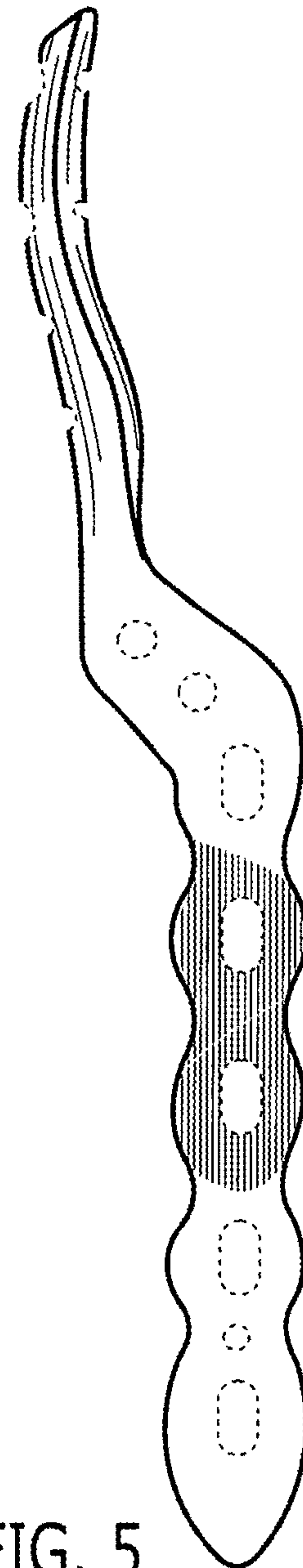


FIG. 5

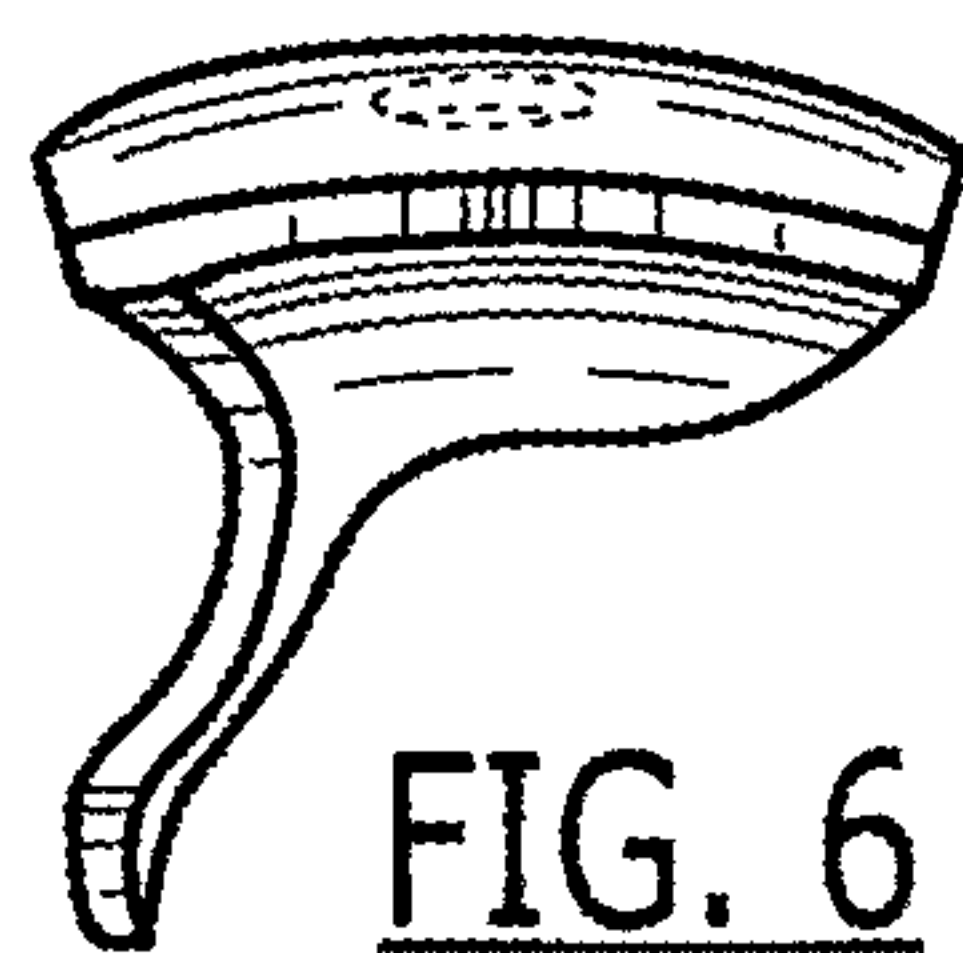


FIG. 6

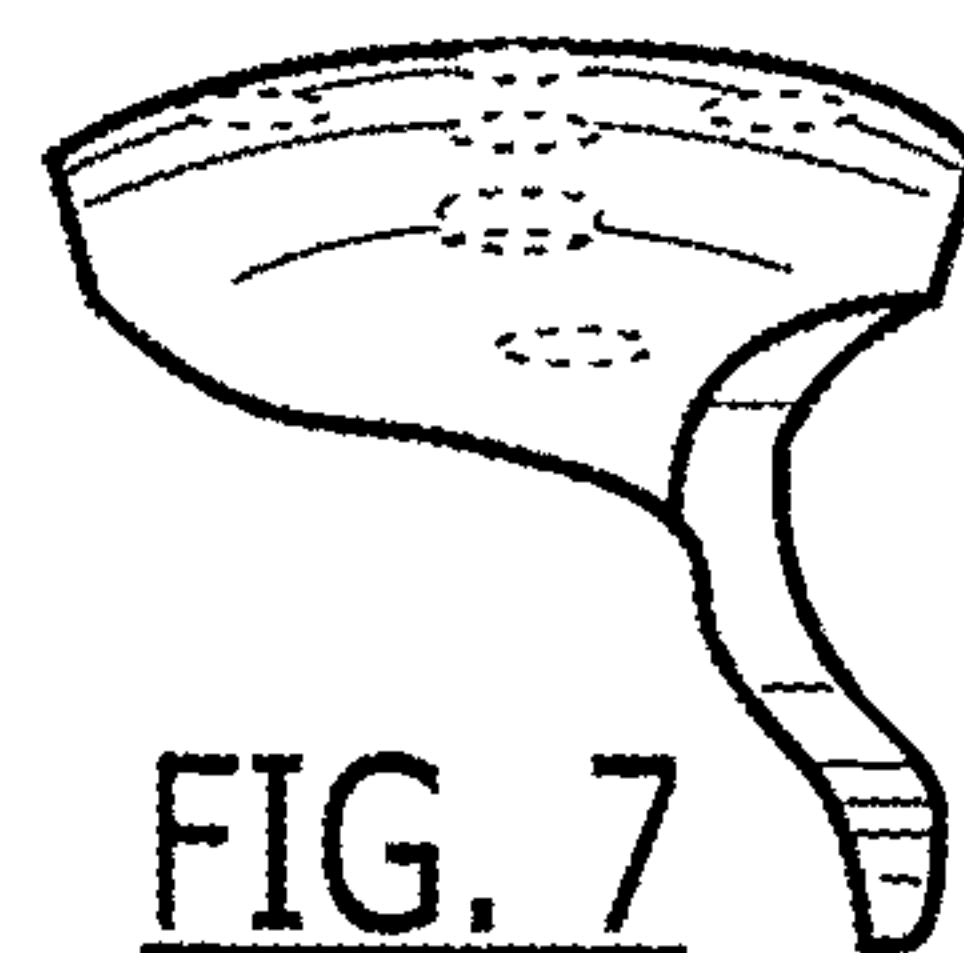


FIG. 7

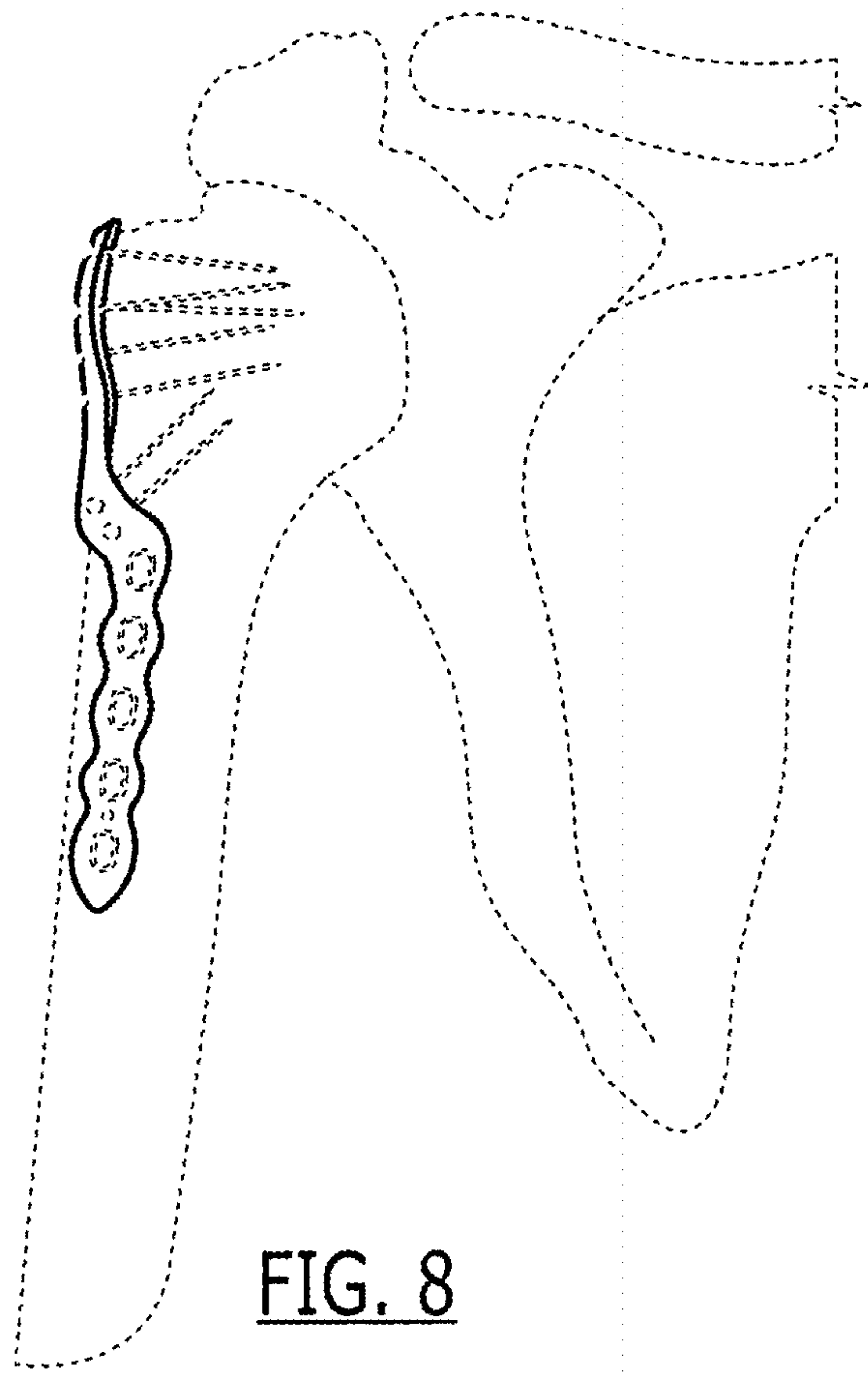


FIG. 8

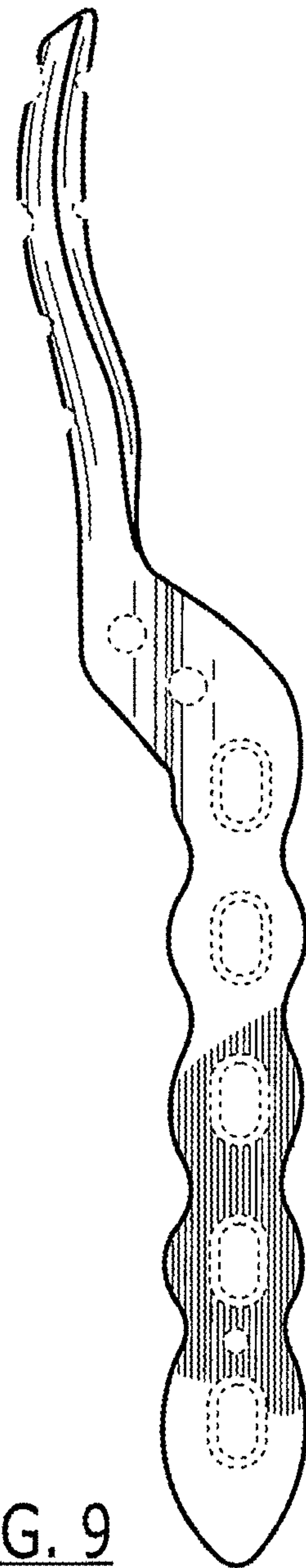


FIG. 9

