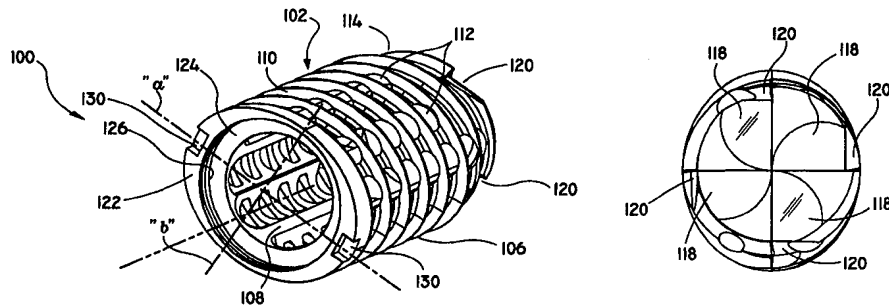




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A61F 2/44, A61B 17/02 A61F 2/46, A61B 17/16	A3	(11) International Publication Number: WO 98/17208 (43) International Publication Date: 30 April 1998 (30.04.98)
(21) International Application Number: PCT/US97/18998 (22) International Filing Date: 22 October 1997 (22.10.97) (30) Priority Data: 08/734,911 22 October 1996 (22.10.96) US 08/822,530 24 March 1997 (24.03.97) US (71) Applicant: SURGICAL DYNAMICS, INC. [US/US]; 111 Glover Avenue, Norwalk, CT 06856 (US). (72) Inventor: WINSLOW, Charles, J.; 25 Hilton Court, Walnut Creek, CA 94595 (US). (74) Agents: ANDRES, John, C. et al.; United States Surgical Corporation, 150 Glover Avenue, Norwalk, CT 06856 (US).	(81) Designated States: AU, CA, JP, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 17 December 1998 (17.12.98)	

(54) Title: APPARATUS FOR FUSING ADJACENT BONE STRUCTURES



(57) Abstract

An apparatus for facilitating the fusion of adjacent bone structures (V1, V2) includes an implant member (100) configured for insertion within a space defined between adjacent bone structures (V1, V2). The implant member (100) includes an entry end portion (114) and a trailing end portion (122) and defines a longitudinal axis. The implant member (100) includes at least a longitudinal portion (102) having a generally elliptical cross-sectional dimension with a major cross-sectional dimension (a) greater than a minor cross-sectional dimension (b). A system (200) for drilling a bore in adjacent vertebrae (V1, V2) to facilitate the insertion of a fusion implant (100) includes a surgical retractor (202) having a sleeve member (210) with proximal (212) and distal (214) end portions and defining a longitudinal opening and a drill instrument (204) positionable within the longitudinal opening of the surgical retractor (202). The retractor (202) is configured for insertion at least partially into an intervertebral space between adjacent opposed vertebrae (V1, V2) to distract the adjacent vertebrae (V1, V2) to a desired predetermined distracted position. At least one anchoring member may be associated with the surgical retractor (202) to facilitate mounting thereof to the vertebrae (V1, V2). The drill instrument (204) includes an elongate member (220) having a longitudinal passageway and defining at least one distal cutting surface and a drill member (224) disposed within the elongate member (220) and having a distal drill head. The drill member (224) is rotatably movable within the elongate member (220) and is also longitudinally fixed to the elongate member (220) such that advancement of the drill member (224) within the retractor (202) causes corresponding advancement of the elongate member (220) such that the distal cutting surface of the elongate member (220) and the distal drill head of the drill member (224) cooperate to cut a non-circular, e.g., an elliptical-shaped, bore in the adjacent vertebrae (V1, V2). Preferably, the elongate member (220) of the drill instrument (204) includes first and second diametrically opposed distal cutting surfaces. The cutting surfaces may be arcuately-shaped.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/18998

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61F2/44 A61B17/02 A61F2/46 A61B17/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61F A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 716 840 A (SURGICAL DYNAMICS) 19 June 1996 see column 9, line 24 - column 14, line 54; figures 17-26 ---	1-20
Y	WO 95 22946 A (FOSTER) 31 August 1995 see page 8, line 8 - line 13 see page 9, line 14 - line 18; claim 13; figures 1C, 4C ---	1-20
A	US 5 458 638 A (KUSLICH) 17 October 1995 see column 8, line 39 - line 45; figures 14-25 ---	1, 13, 20
A	WO 95 32673 A (MICHELSON) 7 December 1995 see the whole document ---	1, 13
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

23 October 1998

Date of mailing of the international search report

30.10.98

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

Intern al Application No PCT/US 97/18998
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 96 27339 A (ADVANCED MICROBOTICS CORPORATION) 12 September 1996 see page 9, line 17 - line 19; figures ---	7,8,10, 15
X	WO 96 27345 A (MICHELSON) 12 September 1996 see the whole document ---	29,43
A	WO 96 27321 A (MICHELSON) 12 September 1996 see the whole document ---	36,51
A	EP 0 077 159 A (ATKINS) 20 April 1983 see the whole document ---	29,36, 43,51
A	WO 95 35180 A (STARK) 28 December 1995 see the whole document ---	29,36, 43,51
A	US 5 062 845 A (KUSLICH) 5 November 1991 see the whole document ---	29,36
P,X	EP 0 796 593 A (SURGICAL DYNAMICS) 24 September 1997 cited in the application see the whole document ---	29,36, 43,51
A	US 5 026 373 A (RAY) 25 June 1991 cited in the application ---	
A	US 5 489 307 A (KUSLICH) 6 February 1996 cited in the application ---	
A	US 5 015 247 A (MICHELSON) 14 May 1991 cited in the application -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 97/18998

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 21-28, 38-42
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Methods for treatment of the human or animal body by surgery
2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

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