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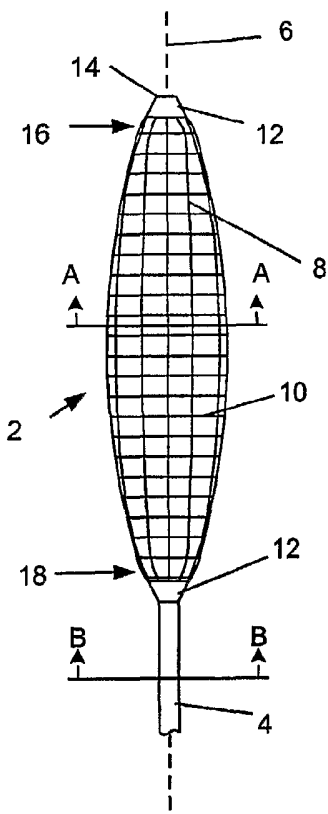
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(54) Title: BALLOON AND METHODS OF MAKING AND USING



(57) Abstract: A surgical balloon is disclosed. The balloon can be woven, knitted or braided. The balloon can withstand extreme pressures relative to other surgical balloons. The balloon can have various geometries, including non-standard shapes. The balloon can be used to expand a support device. The balloon can be used to in an intrabone or interbone space to support bone. Methods of making and using the balloon are also disclosed.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

US: 604/103, 103.06, 103.09; 606/191
 IPC(B): A61M 29/00, 31/00, 37/00

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)

US: 604/508, 509, 95.03, 96.01, 103, 103.1, 103.06-103.09, 103.12, 103.13, 523-527, 915, 917, 921; 606/191, 192, 194
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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 practicable, search terms used)

Micropatent, PubMed

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| X | US 4,796,629 A (GRAYZEL) 10 January 1989 (10.01.1989) entire document | 1-20 |
| -- | | ----- |
| Y | | 21-32 |
| Y | US 2001/0049527 A1 (GRAGG) 06 December 2001 (06.12.2001) entire document | 21, 22 |
| Y | US 2002/0161388 A1 (SAMUELS et al) 31 October 2002 (31.10.2002) entire document | 23-28 |
| Y | US 2003/0032963 A1 (REISS et al) 13 February 2003 (13.02.2003) entire document | 29-32 |
| A | US 4,921,484 A (HILLSTEAD) 01 May 1990 (01.05.1990) entire document | 1-32 |
| A | US 6,746,425 B1 (BECKHAM) 08 June 2004 (08.06.2004) entire document | 1-32 |
| A | US 5,330,429 A (NOGUCHI) 19 July 1994 (19.07.1994) entire document | 1-32 |
| A | US 4,448,195 A (LAVEEN et al) 15 May 1984 (15.05.1984) entire document | 1-32 |
| A | US 6,629,952 B1 (CHIEN et al) 07 October 2003 (07.10.2003) entire document | 1-32 |
| A | US 5,868,779 A (RUIZ) 09 February 1999 (09.02.1999) entire document | 1-32 |
| A | US 5,338,299 A (BARLOW) 16 August 1994 (16.08.1994) entire document | 1-32 |
| A | US 4,637,396 A (COOK) 20 January 1987 (20.01.1987) entire document | 1-32 |
| A | US 2004/0098021 A1 (LAGUNA) 20 May 2004 (20.05.2004) entire document | 1-32 |

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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 | US 6,485,457 B1 (HISAMATSU et al) 26 November 2002 (26.11.2002) entire document | 1-32 |
| A | US 3,831,583 A (EDMUNDS et al) 27 August 1974 (27.08.1974) entire document | 1-32 |
| A | US 5,772,681 A (LEONI) 30 June 1998 (30.06.1998) entire document | 1-32 |
| A | US 6,663,648 B1 (TROTТА) 16 December 2003 (16.12.2003) entire document | 1-32 |
| A | US 6,616,651 B1 (STEVENS) 09 September 2003 (09.09.2003) entire document | 1-32 |
| A | US 4,932,958 A (REDDY et al) 12 June 1990 (12.06.1990) entire document | 1-32 |
| A | US 2003/0114794 A1 (DUCHAMP) 19 June 2003 (19.06.2003) entire document | 1-32 |
| A | US 2003/0149468 A1 (WALLSTEN) 07 August 2003 (07.08.2003) entire document | 1-32 |
| A | US 2002/0193820 A1 (WAKUDA et al) 19 December 2002 (19.12.2002) entire document | 1-32 |
| A | US 2004/0098015 A1 (WEIKEL et al) 20 May 2004 (20.05.2004) entire document | 1-32 |