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(54) Title: DISTRACTION OSTEOGENESIS SYSTEM

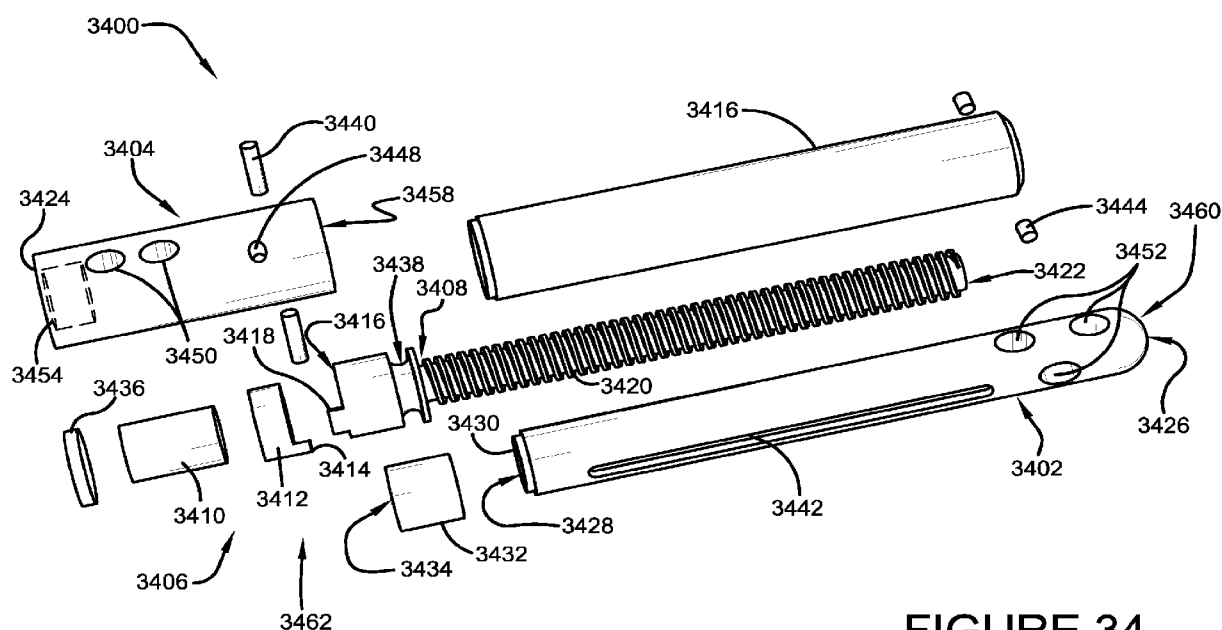


FIGURE 34

(57) Abstract: One or more techniques and/or systems (3400) are disclosed for a system for distraction osteogenesis of long bones. Selectively adjustable drive magnets (3410) disposed in the system can be used to distract the device. An external drive device generating a magnetic field may be used to rotate the drive in externally.

TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011/060336 A1 (POOL SCOTT [US] ET AL) 10 March 2011 (2011-03-10)	1,3,4, 6-8, 11-13, 15,17
A	paragraph [0036] - paragraph [0041] paragraph [0054] figures 1-5,18 -----	2,5,9, 10,14, 16,18-20
A	US 2010/049204 A1 (SOUBEIRAN ARNAUD [FR]) 25 February 2010 (2010-02-25) paragraph [0040] - paragraph [0051] paragraph [0075] - paragraph [0084] figures 13,14 -----	1,11,17
A	US 2009/112207 A1 (WALKER BLAIR [US] ET AL) 30 April 2009 (2009-04-30) paragraph [0187] figure 54 -----	1,11,17
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 15 June 2018	Date of mailing of the international search report 26/06/2018	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Storer, John	

INTERNATIONAL SEARCH REPORT

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011060336	A1	10-03-2011	
		AU 2010289288 A1	22-03-2012
		AU 2016201144 A1	10-03-2016
		CN 102905625 A	30-01-2013
		EP 2473116 A2	11-07-2012
		JP 5751642 B2	22-07-2015
		JP 2013503715 A	04-02-2013
		JP 2015164554 A	17-09-2015
		JP 2017185262 A	12-10-2017
		KR 20120048712 A	15-05-2012
		KR 20170010449 A	31-01-2017
		KR 20170059488 A	30-05-2017
		RU 2012112925 A	10-10-2013
		US 2011060336 A1	10-03-2011
		US 2013261682 A1	03-10-2013
		WO 2011029021 A2	10-03-2011
US 2010049204	A1	25-02-2010	
		CN 101568309 A	28-10-2009
		EP 2068724 A2	17-06-2009
		ES 2616099 T3	09-06-2017
		FR 2906453 A1	04-04-2008
		US 2010049204 A1	25-02-2010
		WO 2008040880 A2	10-04-2008
US 2009112207	A1	30-04-2009	
		CA 2703562 A1	07-05-2009
		CN 101917918 A	15-12-2010
		CN 102920500 A	13-02-2013
		EP 2209431 A1	28-07-2010
		ES 2639014 T3	25-10-2017
		JP 5860496 B2	16-02-2016
		JP 6178371 B2	09-08-2017
		JP 2011502003 A	20-01-2011
		JP 2014204988 A	30-10-2014
		JP 2016013464 A	28-01-2016
		US 2009112207 A1	30-04-2009
		US 2009112262 A1	30-04-2009
		US 2009112263 A1	30-04-2009
		US 2012157996 A1	21-06-2012
		US 2013296859 A1	07-11-2013
		US 2015173820 A1	25-06-2015
		US 2016030089 A1	04-02-2016
		US 2017296249 A1	19-10-2017
		WO 2009058546 A1	07-05-2009