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[Continued on next page]

(54) Title: DESIGNING A FLEXIBLE PATIENT SPECIFIC INSTRUMENT

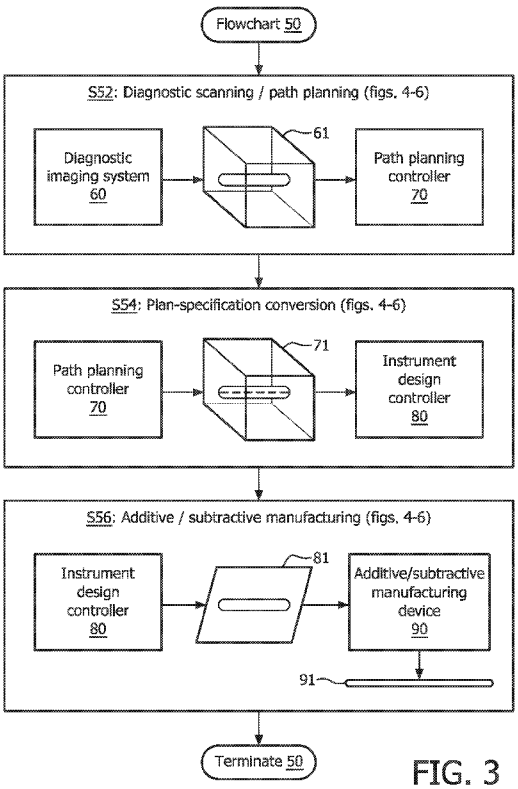


FIG. 3

(57) Abstract: A method for designing and manufacturing a base operating configuration of a flexible patient specific instrument (91) to follow an anatomical path relative to an anatomical structure. The method involves generating a diagnostic scan of the anatomical structure, and delineating an instrument design path relative to the anatomical structure based on a scanned configuration of the anatomical path as illustrated in the diagnostic scan of the anatomical structure. The method further involves rendering a design of the base operating configuration of the flexible patient specific instrument (91) following a portion or an entirety of the instrument design path, and additive manufacturing and/or subtractive manufacturing of flexible patient specific instrument (91) in the base operating configuration and/or a mold of the flexible patient specific instrument (91) in the base operating configuration.

WO 2017/122076 A3

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61J A61M

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)
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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 2009/222059 A1 (HILLIS W DANIEL [US] ET AL) 3 September 2009 (2009-09-03) paragraphs [0004], [0006], [0032] - [0034], [0037] - [0043], [0047], [0053], [0063] - [0064], [0067], [0073], [0081] - [0082], [0096], [0110]; figures 1-2	1-20

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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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.
X	WO 96/03087 A1 (UNIV WASHINGTON [US]; UNIV WASHINGTON EASTERN [US]; DUBACH MARK [US];) 8 February 1996 (1996-02-08) abstract; claim 38; figures 1A-C page 1, line 32 - line 34 page 2, line 7 - line 9 page 4, line 21 - line 23 page 6, line 7 - line 14 page 7, line 3 - line 32 page 9, line 18 - line 34 page 10, line 10 - line 15 page 10, line 26 - page 11, line 19 page 15, line 11 - line 12 page 15, line 18 - line 36 page 16, line 8 - line 12 page 18, line 35 - page 19, line 23 page 28, line 22 - page 42, line 27 page 47, line 13 - line 22 page 72, line 28 - page 83, line 16 -----	1-20
A	US 2006/253197 A1 (NAPIER BRADFORD [US]) 9 November 2006 (2006-11-09) abstract -----	1-3, 15-18

INTERNATIONAL SEARCH REPORT

Information on patent family members

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PCT/IB2016/058093

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009222059 A1	03-09-2009	GB 2473584 A	16-03-2011
		US 2009222059 A1	03-09-2009
		WO 2010008448 A1	21-01-2010
WO 9603087 A1	08-02-1996	AU 3146495 A	22-02-1996
		EP 0774929 A1	28-05-1997
		JP H10503105 A	24-03-1998
		US 5788713 A	04-08-1998
		WO 9603087 A1	08-02-1996
US 2006253197 A1	09-11-2006	US 2006253197 A1	09-11-2006
		WO 2006130322 A2	07-12-2006