



(51) International Patent Classification:

G05G 1/40 (2008.04)	A61F 9/007 (2006.01)
G05G 1/44 (2008.04)	G01L 1/22 (2006.01)
G05G 9/047 (2006.01)	G05G 1/38 (2008.04)
G06F 3/033 (2013.01)	G05G 9/04 (2006.01)
A61B 17/00 (2006.01)	A61B 34/00 (2016.01)
G01L 1/04 (2006.01)	A61B 34/30 (2016.01)

(21) International Application Number:

PCT/IB2017/057013

(22) International Filing Date:

09 November 2017 (09.11.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/423,272 17 November 2016 (17.11.2016) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,

(54) Title: ERGONOMIC FOOT-OPERATED JOYSTICK

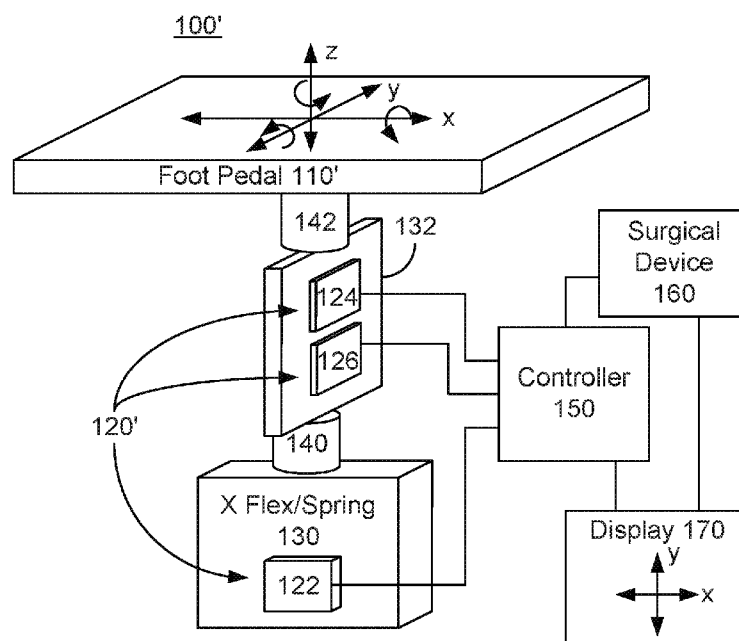


FIG. 2

(57) Abstract: A method and system provide a surgical system including a foot pedal and at least one pressure sensor. The foot pedal has a first axis and a second axis. The first axis and the second axis intersect and are oriented at a nonzero angle. The pressure sensor(s) are coupled with the foot pedal. The pressure sensor(s) sense at least one rotation of the foot pedal around the first axis and the second axis. The pressure sensor(s) provide at least one output based on the rotation(s).



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:

19 July 2018 (19.07.2018)

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2017/057013

A. CLASSIFICATION OF SUBJECT MATTER

INV. G05G1/40 G05G1/44 G05G9/047 G06F3/033 A61B17/00
G01L1/04 A61F9/007 G01L1/22 G05G1/38 G05G9/04
A61B34/00 A61B34/30

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)

G06F H01H A61B G05G

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)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2016/042407 A1 (BONORA VALERIO [FR]; CHESNAIS STANISLAS [FR]; LECLERCQ SYLVAIN [FR]; F) 24 March 2016 (2016-03-24)	1,9,10
A	page 13, line 22 - line 27; figures 8,11 page 9, line 2 - line 3	2-8, 11-15
X	US 2014/267195 A1 (ENNS RICHARD B [CA]) 18 September 2014 (2014-09-18)	1-7
Y	figures 2,3	11-15
X	WO 2016/179459 A1 (KHOJASTEH PEDRAM [US]) 10 November 2016 (2016-11-10)	1,8
Y	figure 3	
Y	WO 98/08449 A1 (STORZ INSTR CO [US]) 5 March 1998 (1998-03-05)	11-15
A	figure 1	1
	-/-	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search

5 June 2018

Date of mailing of the international search report

14/06/2018

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2017/057013

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 4 970 486 A (GRAY THOMAS J [US] ET AL) 13 November 1990 (1990-11-13) figure 2 -----	1-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2017/057013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2016042407	A1	24-03-2016	EP 3194041 A1 26-07-2017
			JP 2017534303 A 24-11-2017
			US 2017185168 A1 29-06-2017
			WO 2016042407 A1 24-03-2016
US 2014267195	A1	18-09-2014	CA 2846985 A1 18-09-2014
			US 2014267195 A1 18-09-2014
WO 2016179459	A1	10-11-2016	CN 107708820 A 16-02-2018
			EP 3291897 A1 14-03-2018
			US 2016328028 A1 10-11-2016
			WO 2016179459 A1 10-11-2016
WO 9808449	A1	05-03-1998	AU 714226 B2 23-12-1999
			AU 720530 B2 01-06-2000
			AU 723086 B2 17-08-2000
			AU 723513 B2 31-08-2000
			AU 723523 B2 31-08-2000
			AU 723587 B2 31-08-2000
			AU 723829 B2 07-09-2000
			AU 724661 B2 28-09-2000
			AU 4093997 A 19-03-1998
			AU 4169397 A 19-03-1998
			AU 4239497 A 19-03-1998
			BR 9711274 A 11-12-2001
			BR 9711275 A 16-10-2001
			BR 9711287 A 30-10-2001
			BR 9711288 A 06-11-2001
			BR 9711646 A 06-08-2002
			CA 2263975 A1 05-03-1998
			CA 2264036 A1 05-03-1998
			CA 2264040 A1 05-03-1998
			CA 2264041 A1 05-03-1998
			CA 2264103 A1 05-03-1998
			CA 2264145 A1 05-03-1998
			CA 2264659 A1 05-03-1998
			CA 2264663 A1 05-03-1998
			CA 2264738 A1 05-03-1998
			CN 1231589 A 13-10-1999
			CN 1235527 A 17-11-1999
			CN 1235528 A 17-11-1999
			CN 1235529 A 17-11-1999
			CN 1235530 A 17-11-1999
			CN 1235531 A 17-11-1999
			CN 1235535 A 17-11-1999
			CN 1236309 A 24-11-1999
			CN 1251507 A 26-04-2000
			CN 1515235 A 28-07-2004
			DE 69728793 D1 27-05-2004
			DE 69728793 T2 23-09-2004
			DE 69731225 D1 18-11-2004
			DE 69731225 T2 03-03-2005
			DE 69734592 D1 15-12-2005
			DE 69734592 T2 10-08-2006
			EP 0929263 A1 21-07-1999
			EP 0949881 A1 20-10-1999
			EP 0951241 A1 27-10-1999
			EP 0955899 A1 17-11-1999

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2017/057013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		EP 0955984 A1	17-11-1999
		EP 1006891 A1	14-06-2000
		EP 1006892 A1	14-06-2000
		EP 1006893 A1	14-06-2000
		EP 1006894 A1	14-06-2000
		EP 1550405 A2	06-07-2005
		EP 1550406 A2	06-07-2005
		EP 1704839 A1	27-09-2006
		EP 1925274 A2	28-05-2008
		ES 2222518 T3	01-02-2005
		ES 2231888 T3	16-05-2005
		ES 2252792 T3	16-05-2006
		ES 2326603 T3	15-10-2009
		JP 4094063 B2	04-06-2008
		JP 4467645 B2	26-05-2010
		JP 4551423 B2	29-09-2010
		JP 2000515050 A	14-11-2000
		JP 2001522253 A	13-11-2001
		JP 2001522254 A	13-11-2001
		JP 2001522255 A	13-11-2001
		JP 2001522256 A	13-11-2001
		JP 2001522257 A	13-11-2001
		JP 2002509454 A	26-03-2002
		JP 2002510980 A	09-04-2002
		JP 2002510981 A	09-04-2002
		JP 2007260417 A	11-10-2007
		JP 2010088916 A	22-04-2010
		WO 9808442 A1	05-03-1998
		WO 9808445 A1	05-03-1998
		WO 9808446 A1	05-03-1998
		WO 9808447 A1	05-03-1998
		WO 9808448 A1	05-03-1998
		WO 9808449 A1	05-03-1998
		WO 9808450 A1	05-03-1998
		WO 9808451 A1	05-03-1998
		WO 9808452 A1	05-03-1998
		WO 9808453 A1	05-03-1998
		WO 9808479 A1	05-03-1998
US 4970486	A	13-11-1990	NONE