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(54) **Device and method for assisting laparoscopic surgery - rule based approach**

(57) The present invention provides a surgical controlling system, comprising at least one surgical tool adapted to be inserted into a surgical environment of a human body for assisting a surgical procedure, at least one location estimating means, at least one movement detection means and a controller adapted to control the spatial position of said at least one surgical tool. The con-

troller's database is adapted to store a predetermined set of rules according to which ALLOWED and RESTRICTED movements of said at least one surgical tool are determined. Each detected movement of the at least one surgical tool is determined as either an ALLOWED movement or as a RESTRICTED movement according to the predetermined set of rules.

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EUROPEAN SEARCH REPORT

 Application Number
 EP 14 15 0541

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,P	WO 2013/027200 A2 (M S T MEDICAL SURGERY TECHNOLOGIES LTD [IL]; SHOLEV MORDEHAI [IL]; PFE) 28 February 2013 (2013-02-28) * the whole document *	1-17	INV. A61B1/00 A61B5/06 A61B19/00
X	US 2008/262297 A1 (GILBOA PINHAS [IL] ET AL) 23 October 2008 (2008-10-23) * the whole document *	16-18	
A	US 2008/004603 A1 (LARKIN DAVID Q [US] ET AL) 3 January 2008 (2008-01-03) * the whole document *	1-8, 11-13	
A	US 6 714 841 B1 (WRIGHT JAMES [US] ET AL) 30 March 2004 (2004-03-30) * the whole document *	1-8, 11-13	
			TECHNICAL FIELDS SEARCHED (IPC)
			A61B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 August 2014	Examiner Schindler, Martin
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			



Application Number

EP 14 15 0541

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 14 15 0541

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-8, 11-13

How to avoid collision with other objects, e.g. tissue or other surgical instruments.

2. claims: 9, 10, 14-18

How to optimise the field of view of the operator during the surgical procedure.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 15 0541

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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13-08-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2013027200 A2	28-02-2013	EP 2744389 A2	25-06-2014
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		WO 2013027200 A2	28-02-2013
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US 6714841 B1	30-03-2004	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	辅助腹腔镜手术的装置和方法 - 基于规则的方法		
公开(公告)号	EP2754383A3	公开(公告)日	2014-09-24
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[标]申请(专利权)人(译)	M.S.T.医学外科技术有限公司		
申请(专利权)人(译)	M.S.T.医疗手术TECHNOLOGIES LTD.		
当前申请(专利权)人(译)	M.S.T.医疗手术TECHNOLOGIES LTD.		
[标]发明人	FRIMER MOTTI SHOLEV MORDEHAI PFEFFER YEHUDA		
发明人	FRIMER, MOTTI SHOLEV, MORDEHAI PFEFFER, YEHUDA		
IPC分类号	A61B1/00 A61B5/06 A61B19/00		
CPC分类号	A61B1/00006 A61B1/00009 A61B1/0016 A61B1/3132 A61B5/064 A61B34/20 A61B34/30 A61B90/03 A61B2034/2048 A61B2090/365		
审查员(译)	迅达MARTIN		
优先权	61/750856 2013-01-10 US		
其他公开文献	EP2754383A2		
外部链接	Espacenet		

摘要(译)

本发明提供一种手术控制系统，包括至少一个适于插入人体外科手术环境中以辅助外科手术的手术工具，至少一个位置估计装置，至少一个运动检测装置和适应的控制器控制所述至少一个手术工具的空间位置。控制器的数据库适于存储预定的一组规则，根据该规则确定所述至少一个手术工具的允许和受限制的运动。根据预定的一组规则，将至少一个手术工具的每个检测到的运动确定为允许运动或限制运动。

		EUROPEAN SEARCH REPORT		Application Number EP 14 15 0541
DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CATEGORY OF THE DOCUMENT (IPC Class)	
X, P	WO 2013/027200 A2 (M S T MEDICAL SURGERY TECHNOLOGIES LTD [IL]; SHOLEV MORDEHAI [IL]; PFE) 28 February 2013 (2013-02-28) the whole document	1-17	INV. A61B1/00 A61B5/06 A61B19/00	
X	US 2008/062297 A1 (GILBOA PINHAS [IL] ET AL) 23 October 2008 (2008-10-23) the whole document	16-18		
A		1-8, 11-13		
A	US 2008/004603 A1 (LARKIN DAVID Q [US] ET AL) 3 January 2008 (2008-01-03) the whole document	1-8, 11-13		
A	US 6 714 841 B1 (WRIGHT JAMES [US] ET AL) 30 March 2004 (2004-03-30) the whole document	1-8, 11-13		
			TECHNICAL FIELD, SEARCHED (IPC)	
			A61B	
The present search report has been drawn up for all claims				
Name of inventor Munich		Date of invention or of design 13 August 2014		Examiner Schindler, Martin
CATEGORY OF CITED DOCUMENTS 0: particularly relevant if taken alone 1: document of the same category with another 2: non-relevant if taken alone 3: non-relevant if taken with another 4: non-relevant document				
1: device or principle underlying the invention or part thereof 2: prior art 3: document cited in the application 4: document cited in other reasons 5: document of the same patent family, corresponding document				