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World's First Flexible Ureteroscopy Robot and Robotic Retrograde Intra-Renal Surgery (RIRS) - Lithotripsy

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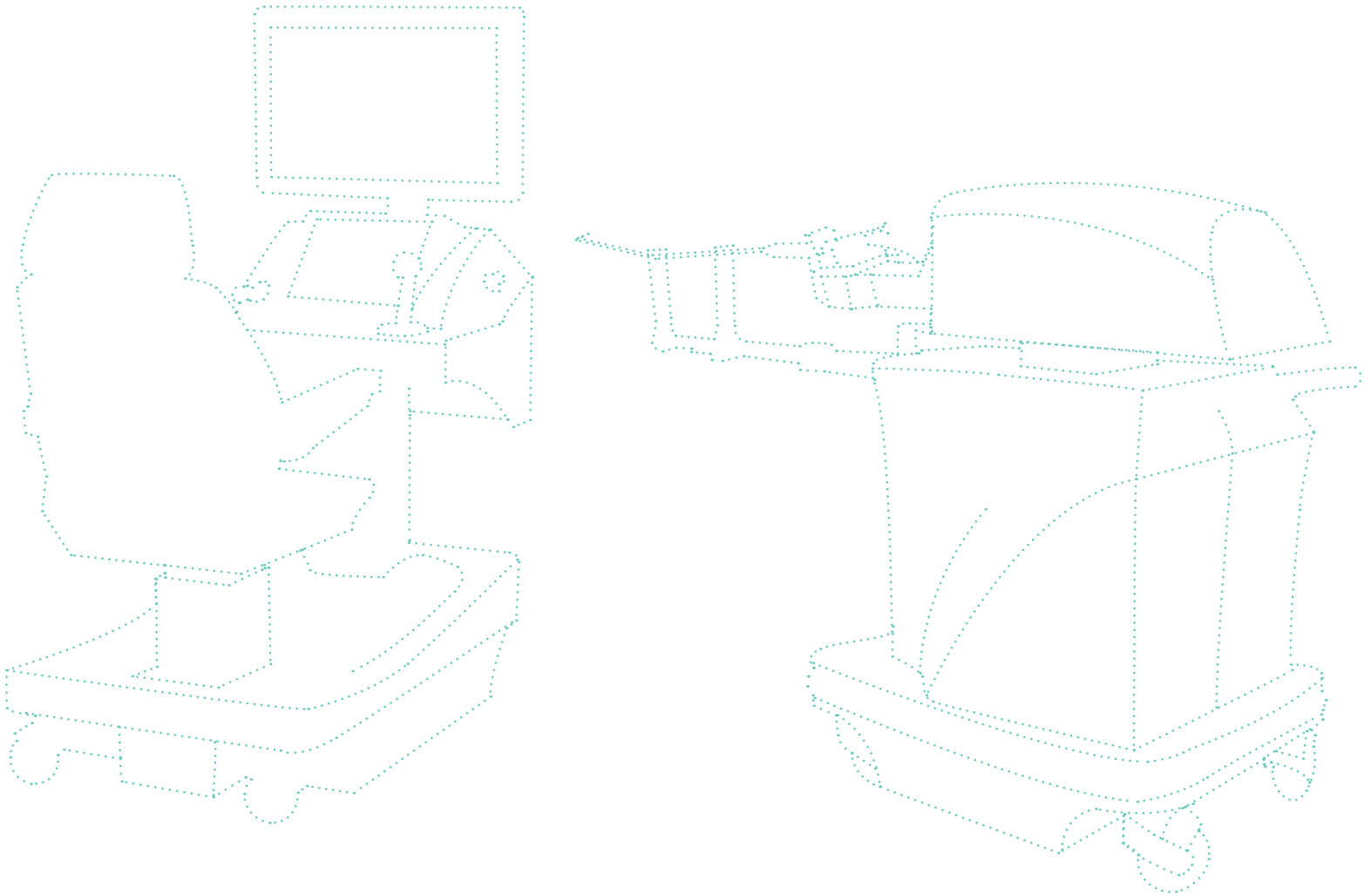
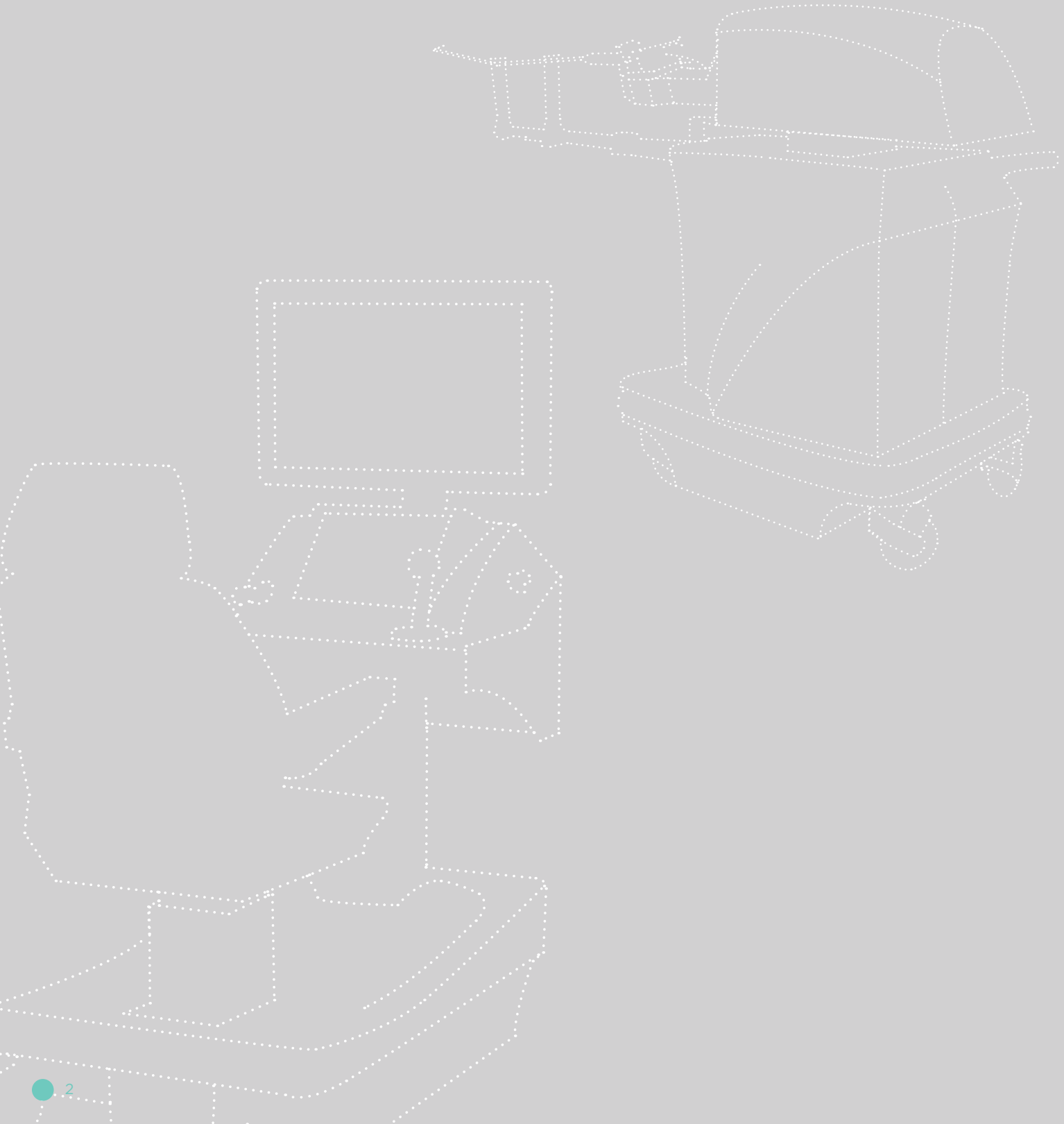
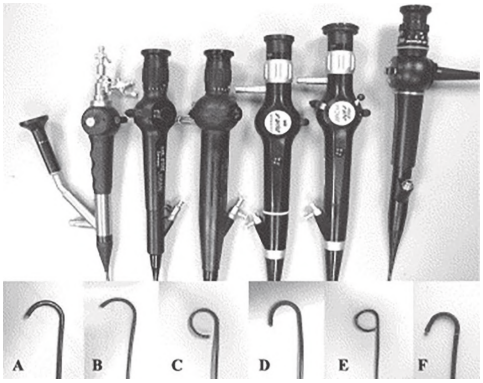
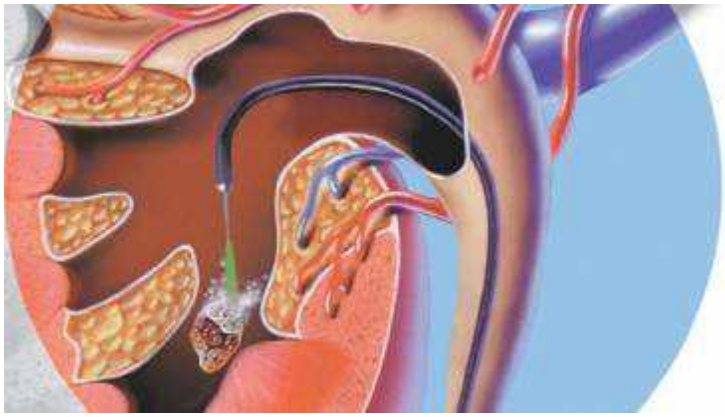


World's First Flexible Ureteroscopy Robot and Robotic Retrograde Intra-Renal Surgery (RIRS) - Lithotripsy







Retrograde Intra Renal Surgery (RIRS)

- Developments in medical technology, enables smaller diameter flexible endoscopes than flexible gastroscopes/colonoscopes called as flexible uretero-renoscopes which can be inserted inside the uretery with the diameter less than 3 mm.
- These flexible ureterorenoscopes (fURS) have been developed and become widespread in endo-urology field in recent years with the introduction of the RIRS treatment method which allows the laser to pass through the bladder and ureter through natural channels (without puncturing or cutting the patient) and pulverizing the stones in the pelvis and calyx in the kidney.

Application of RIRS Method by use of fURS:

- Treatment of kidney stones by flexible ureteroscopy is becoming widespread and the endo urologiests attempts to treat larger stones with RIRS and present those results on in recent congresses.
- However, manipulation of the flexible uretero-renoscopes by hand is extremely difficult and tiresome. The surgeon should wear the lead apron and sterile surgical gown during the RIRS. Once the stone has been detected, the surgeon should keep his position in standing and should dust the stone with Holmium Laser by precise movements for 30-60 minutes in that extremely difficult position. That is limiting the use of this method for larger stones. Dusting large stones with the laser can sometimes takes as long as 2 hours.
- The learning curve of RIRS is very long and to become experienced in flexible ureteroscopy requires many cases (generally 30-40) and costs a lot money because of misuse of endoscopes.

Why is it necessary to use a robot for fURS in RIRS?

The use of robots is rapidly becoming widespread throughout the world in all areas of surgery. Leading urologists also say that 'robotic surgery is the future of endo-urology'.

Robot for Patients :

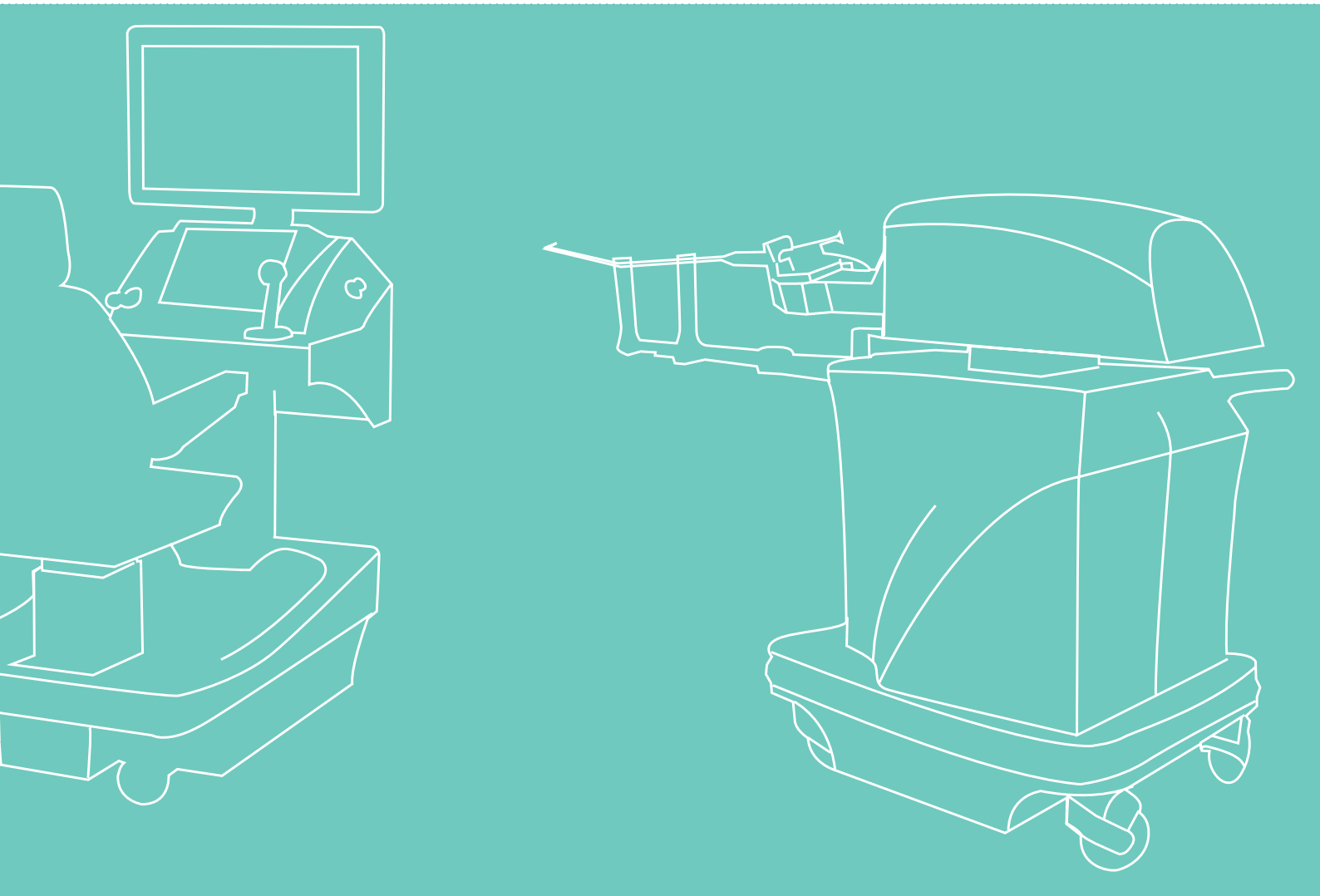
- It enables the treatment without puncturing or cutting the patient thru natural channel and return to the daily life by rapid healing.
- It increases the success of stone free rate in first session, enables to shorten the duration of treatment.
- It reduces the exposure of radiation applied to patient.

Robot for Hospitals:

- Robotic treatments are extremely attractive to patients looking for new technologies; It increases the number of foreign and domestic patients, especially health tourism. It increases the prestige of the hospitals.
- Extremely expensive and fragile endoscope is protected by the robot, and the lifetime will be increased approximately 10 times longer compared by hand which is 20-30 cases according to the literature. This reduces the operation cost.
- Because of it's shorter learning curve, the number of surgeons who can do the RIRS increases, and it enables that RIRS can be applied even in peripheral hospitals. So it reduces the gap between regions.

Robot for Surgeon:

- Sitting on the ergonomic control console, allows surgeon to work without fatigue, loss of concentration
- Reduce exposure to radiation by working away from the radiation zone
- Simplifies realization of orientation by 3D simulation of endoscope and kidney
- It shortens the learning curve of the RIRS method and provides 24 times more precise manipulation than manual precision
- It allows surgeons to make much more operations without tiring than manually
- Provides easy, safe and successful treatment of even larger stones



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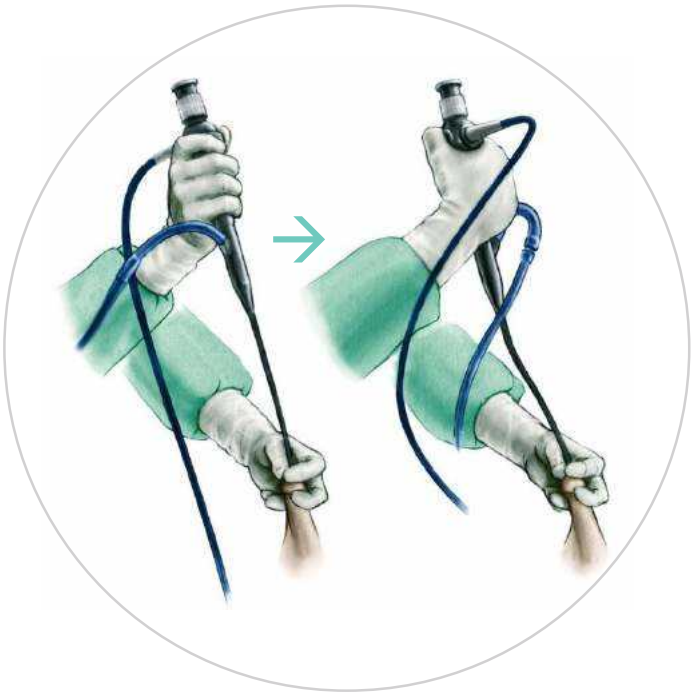
World's First Flexible Ureteroscopy Robot

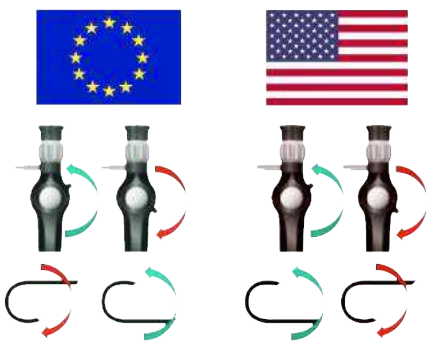


Flexible Ureteroscopy (fURS) Roboflex Offers:

- Better treatment of the patient
- Ability to rotate more than manual (3.5 times more)
- Manually 120º rotation
- Robotically 440º rotation (almost 1 ¼ turn)

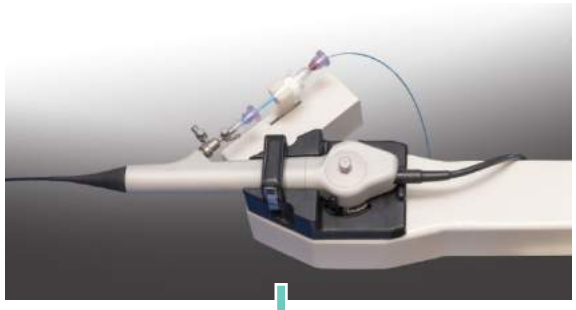
Advantages of Flexible Ureteroscopy (fURS) Roboflex

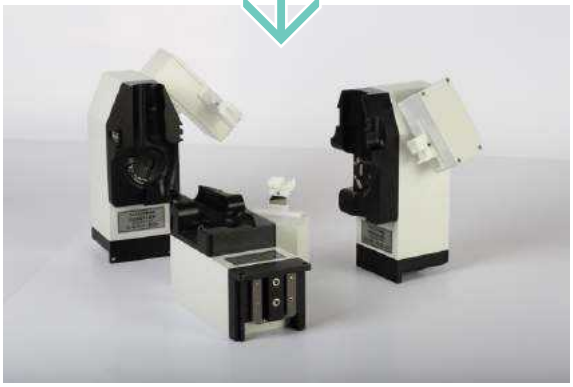
- More precise deflection
- Manually 10° deflects the tip 60°
- Robotically 10° deflects the tip upto 2.5°
- Roboflex is 24 times more precise than manual use
- It is able to switch the deflection style between European (EU) or American (USA) standard.



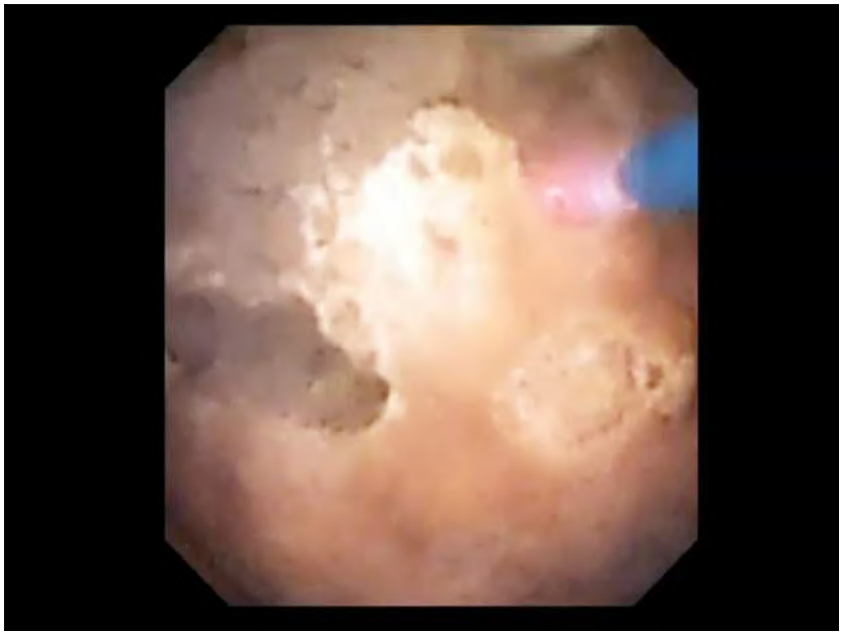
- The surgeon can manipulate and control procedures from the main Control Console
- It is a precise in /out movement of endoscope by selecting the speed between 0.5mm and 20mm/sec
- Remotely control the precise movement of Laser fiber
- Activation and selection of flow speed of the Irrigation fluid

Interchangeable flexible ureteroscope holders that enable the use all brands and models of flexible URS available in the market.



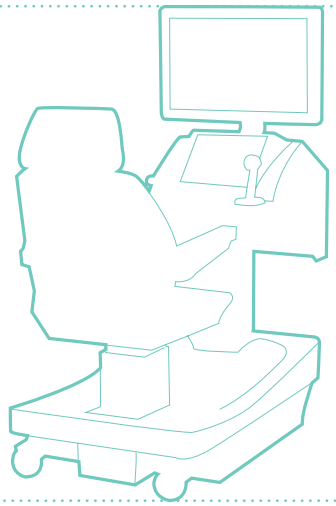


- Exceptional stone dusting is achieved with precise movements well above the precision that can be achieved manually
- Deflection, rotation and advance movements can be perfectly controlled
- Respiration compensation is under control



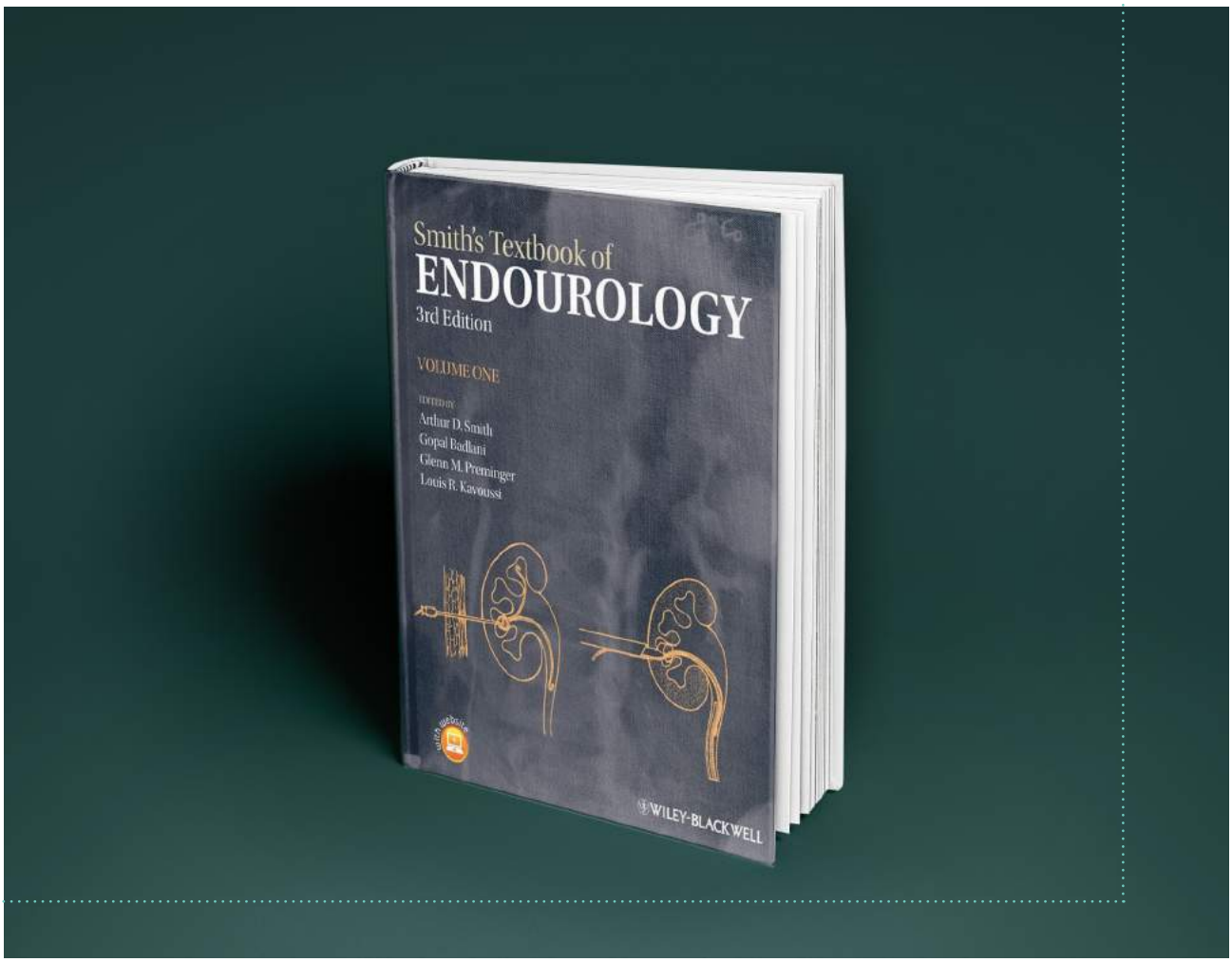
Dusting of stone with highly precise movements of the tip of fURS

Image Processing and 3D Animation



- The current position information of the robot is displayed on the Endoscopy video screen
- 3D simulation of the endoscope tip is shown according to the location of the kidney
- Easy orientation with 3-D simulation, less fluoroscopy use and better concentration

Prof. Dr. Arthur Smith wrote a chapter in his book ‘Smith’s Textbook of Endourology’ featuring Roboflex technology and application



AVICENNA ROBOFLEX
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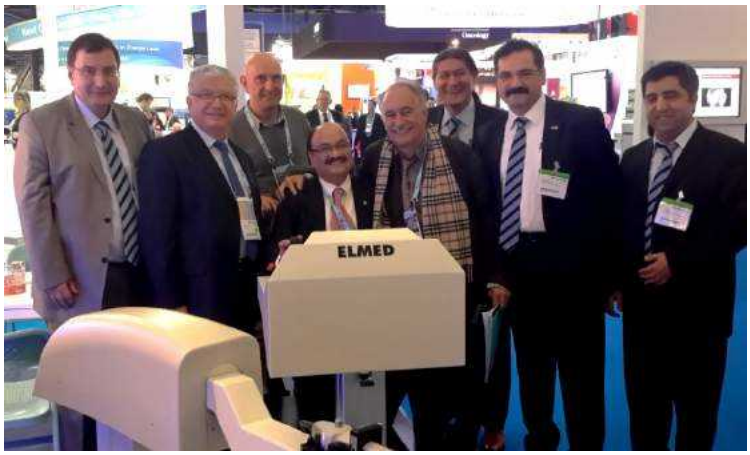
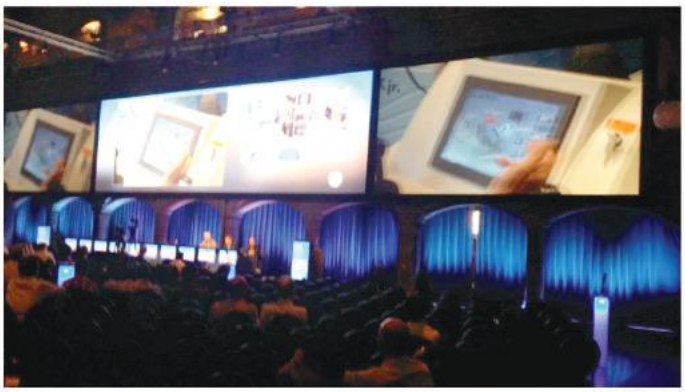
Roboflex awards and recognitions for technology and innovation in Urology and Endourology around the world.

Live Surgeries Demonstrations in Congresses:

EAU Stockholm



ERUS Amsterdam

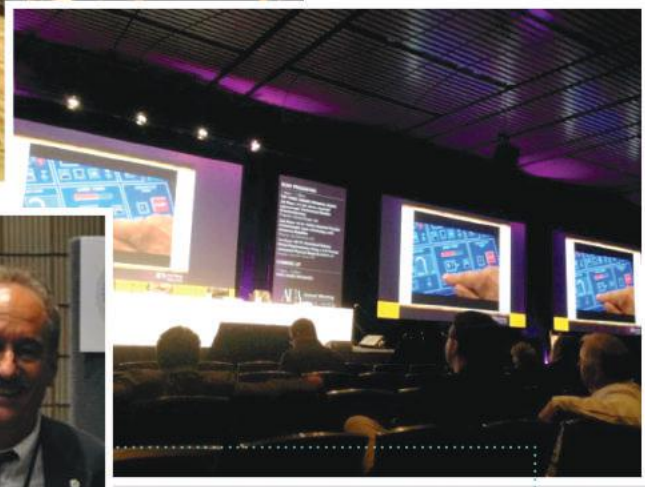


AUA Segura Qatar Doha

IAE Milano

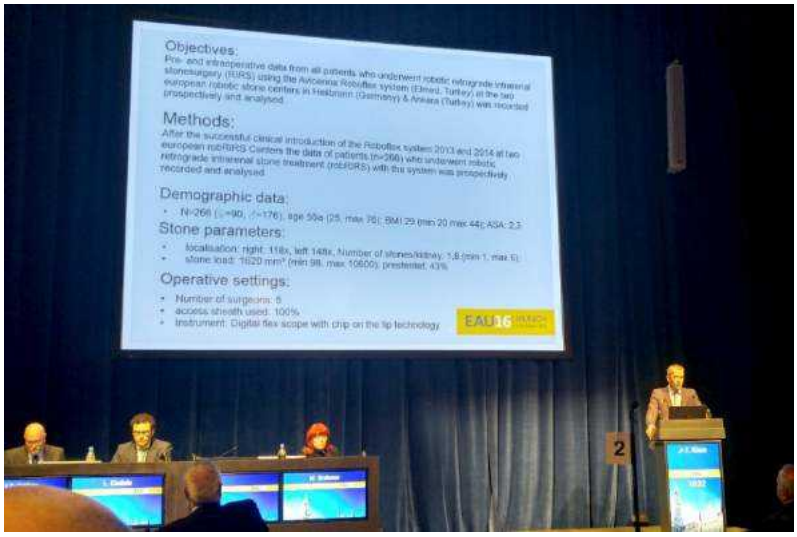
8th Int Course on FlexURS 2015 Rome

AUA New Orleans



Prof. Dr. Jens Rassweiler awarded for Roboflex presentation at AUA

EAU Munich


Objectives:
Methods:
Demographic data:
Stone parameters:
Operative settings:
EAU16

HEILDELBERG UNIVERSITY
SLK Kliniken-Heilbronn / GERMANY

Well-known urologist, Prof. Dr. Jens Rassweiler, has been using Roboflex since 2014. Prof. Rassweiler is recognized as one of the main speakers invited in many urology congresses and presenting the advantages of using Roboflex.

ULM UNIVERSITY
Urology Department, Ulm / GERMANY

Dr. Jan Klein, from Germany has been using Roboflex. He has presented his successful results at many urology congresses.

SHEIKH KHALIFA GENERAL HOSPITAL
Umm Al Quwain / UAE

Roboflex was installed at the United Arab Emirates, the president of the Emirates Urology Association Dr. Abdulqadir Zarooni and the Secretary General of the Arab Urology Association Prof. Dr. Yasser Farahat are presenting their successful results in various congresses.

HAMAD MEDICAL CORPORATION
Al- Wakra Hospital/ QATAR

Roboflex has been used by Prof. Dr. Ahmad Shamshoodini. He organizes international workshops performing live surgeries.

World re-known Urologists who have used Roboflex:

- Prof. Dr. Glenn Preminger – USA
- Dr. David Hoenig – USA
- Prof. Dr. Sven Lahme – Germany
- Prof. Dr. Gerhard Fuchs – Germany
- Prof. Dr. Thomas Knoll – Germany
- Dr. Michael Straub – Germany
- Dr. Guido Giusti – Italy
- Prof. Dr. Anup Patel – UK
- Dr. Enrique Pérez-Castro – Spain
- Dr. Sergio Colom – Spain
- Dr. Oriol Angerri – Spain
- Prof. Dr. Petrisor Geavlete – Romania
- Dr. Marin Georgiev – Bulgaria
- Dr. Kandarp Parikh – India
- Dr. Pawan Kumar Gupta – India
- Dr. Fabio Vicentini – Brasil
- Dr. Marek Zawadzki – Poland

Urologists who have used Roboflex:

- Prof. Dr. Kemal Sarıca : Kartal Training and Research Hospital – İstanbul
- Prof. Dr. Turhan Caşkurlu : Medeniyet University Hospital – İstanbul
- Prof. Dr. Ahmet Yaser Müslümanoğlu : Bağcılar Training and Research Hospital – İstanbul
- Prof. Dr. Abdullah Armağan : Medical Park İstanbul Bahçelievler Hospital – İstanbul
- Doç. Dr. Volkan Tuğcu : Bakırköy Dr. Sadi Konuk Training and Research Hospital – İstanbul
- Doç. Dr. Murat Binbay : Haseki Training and Research Hospital – İstanbul
- Doç. Dr. Bülent Erkut : Medipol University Mega Medipol Hospital – İstanbul
- Prof. Dr. Abdurrahim İmamoğlu : Yıldırım Beyazıt Unv. Dışkapı Training and Rese. Hospital – Ankara
- Prof. Dr. Ali Fuat Atmaca : Yıldırım Beyazıt Unv. Atatürk Training and Research Hospital – Ankara
- Prof. Dr. Selahattin Bedir : Gülhane Training and Research Hospital – Ankara
- Prof. Dr. Mut Şafak : Ankara University Faculty of Medicine - İbni Sina Hospital – Ankara
- Dr. Mehmet İlker Gökçe : Ankara University Faculty of Medicine - İbni Sina Hospital – Ankara
- Dr. Evren Süer : Ankara University Faculty of Medicine -İbni Sina Hospital – Ankara
- Dr. Nida Zafer Tokatlı : Medicana International Ankara Hospital – Ankara
- Doç. Dr. Murat Savaş : Antalya Training and Research Hospital – Antalya

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available at www.sciencedirect.com
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European Association of Urology

Surgery in Motion

A New Robot for Flexible Ureteroscopy: Development and Early Clinical Results (IDEAL Stage 1–2b)

Remzi Saglam[a], *Ahmet Yaser Muslumanoglu*[b], *Zafer Tokatlı*[a], *Turhan Çaşkurlu*[c], *Kemal Sarica*[d], *Ali İhsan Taşçi*[e], *Bülent Erkurt*[f], *Evren Süer*[g], *Ahmet Sinan Kabakci*[h], *Glenn Preminger*[i], *Olivier Traxer*[j], *Jens J. Rassweiler*[k,l,*]

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A multi-centered clinical study by 7 experts on 81 patients was published in the most important journal of urology.

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PATENTS AND CERTIFICATES


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代理人 赵新军 郑小军

(51) Int. Cl.
A61B 34/30(2016.01)I

(54) 发明名称
机器人操纵器系统

(57) 摘要
本申请提供一种机器人操纵器系统，用于协助医疗器具，包括在医疗过程期间执行该医疗过程的装置，所述机器人操纵器系统包括：至少一个能够移动患者支撑人的至少两个机构；(2) 至少一个机器人操纵器；以及与该至少两个机构和(2)通信并响应所述操作者输入指令，所述机器人操纵器 (1) 包括至少一个控制器，一个旋转机构，其与所述至少一个控制器通信和响应第一轴旋转，一个水平移动单元 (6)，其与所述至少一个控制器通信和控第一移动移动，以及一个控制单元被提供有第三的旋转移动单元 (6)，所述旋转移动器 (6) 与所述至少一个控制器连接和响第一器件移动，以及单独连接到所述机构的连接，其中所述机器人操纵系统在医疗期间连续操纵。


JP 2016-520334 A 2016.7.14

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Kenji SAGLAM
トルコ, アンカラ, チャンカヤ, メトキュル・マハレシ, 2025ソカク・ナンバー：12

最終頁に続く

(54)【発明の名称】ロボットマニュピレータシステム

(57)【要約】
【課題】ロボットマニュピレータシステムを提供する。
【解決手段】ロボットマニュピレータシステムは、オペレータ入力を受信可能である少なくとも1つの制御ユニット(2)と、前記制御ユニット(2)と通信し、前記オペレータ入力に応答する少なくとも1つのロボットマニュピレータ(1)とを備える。
前記ロボットマニュピレータ(1)は、少なくとも1つのコントローラと、前記少なくとも1つのコントローラと通信し、第1軸周りに回転する回転機構と、前記少なくとも1つのコントローラと通信し、第2軸周りに回って変位するための第1ユニット(5)と、前記少なくとも1つのコントローラと通信し、第3軸周りに回って変位するための第2ユニット(6)と、前記第1ユニットおよび第2ユニットに取り付けられ、前記第2軸周りに回って変位するための第3ユニット(7)と、前記第3ユニットに取り付けられ、前記第3軸周りに回って変位するための第4ユニット(8)と、前記第4ユニットに取り付けられ、前記第4軸周りに回って変位するための第5ユニット(9)と、前記第5ユニットに取り付けられ、前記第5軸周りに回って変位するための第6ユニット(10)と、前記第6ユニットに取り付けられ、前記第6軸周りに回って変位するための第7ユニット(11)と、前記第7ユニットに取り付けられ、前記第7軸周りに回って変位するための第8ユニット(12)とを備える。
【選択図】図1


مدينة الملك عبدالعزيز للعلوم والتقنية
KACST

[19] المملكة العربية السعودية SA
مدينة الملك عبدالعزيز للعلوم والتقنية

[11] رقم البراءة: ٣٥٥١
[45] تاريخ المنح: ١٤٣٨/٠٨/١١ هـ
الموافق: ٢٠١٧/٠٥/١٠ م

[12] براءة اختراع

[72] اسم المخترع: احمت سينان مغامانغي، ايرهان مكوزك، زيعزي ساجلام
[73] مالك البراءة: (١) احمت سينان مغامانغي ٢) ايرهان مكوزك ٣) زيعزي ساجلام
عنوانه: (١) بلدي سينمي ماهالليسي، جيسمان سانايي سيتيسي ٣٠/٧ سوموطاك رقم ١٧، ٣٣٣٠، بينغولي/تركيا، ترخيصا ٢) جاديديه ماه كوراك بينر سان، رقم ٣ ك ٢ سي مكانلي رقم ٢ بليمغداغي/تركيا، ترخيصا ٣) سوتوجاك ماه ٣٠/٢٥ سوك رقم ١٢ مغنيساغايا/تركيا، ترخيصا
جنسيته: (١) ترخيكي ٢) ترخيكي ٣) ترخيكي
[74] الوكيل: سعود محمد علي الشواف للمحاماة والاستشارات القانونية
اسم المفاضي: علي بن يحيى شواي
[21] رقم الطلب: ١٤٣٦/٠٦٢٦
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[87] رقم النشر الدولي: WO/2014/133476
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[30] بيانات الأسبقية:
٦١/٧٦٩,٤٠٣ US ٢٠١٣/٠٢/٢٦ م
[51] التصنيف الدولي (IPC): A61H 018/022, A61H 019/000
[56] المراجع:
٦,٠١٢,٦٥٧ US ٢٠١٢/٠٧/١٠ م

[54] اسم الاختراع: نظام توجيه آلي
A robotic manipulator system
[57] الملخص: يتعلق الاختراع الحالي بتوجيه نظام توجيه آلي robotic manipulator system الموجود في الموقع المطلوب داخل المنطقة المستهدفة اثناء الاجراء الطبي medical procedure يشتمل نظام التوجيه الآلي المذكور على وحدة تحكم central unit (١) واحد على الاقل قادر على استقبال مدخلات المشغل operator input موجه الى (١) واحد على الاقل يتصل مع وحدة التحكم (٢) المذكورة ويستجيب لمدخلات المشغل المذكورة ويتضمن الموجه الآلي (١) المذكور اداة تتحكم controller واحدة على الاقل اليه دوران rotation mechanism يتصل مع اداة التحكم الواحدة على الاقل للمذكور ويحيث تدور محول محور اول axis واحدة المرتفعة الاقصية الاقل يتصل مع اداة (٤) horizontal movement unit التحكم الواحدة على الاقل المذكورة يحيث يتم إزاحتها على طول مسار اول first path ومشغل الانحراف deflection actuator (٥) قادر على استقبال على الاقل الموجود (١٠) يتصل بمشغل الانحراف (٥) المذكور يتصل مع اداة التحكم الواحدة على الاقل المذكورة ويتم لإزاحة على امتداد مسار ثان second path instrument (٦) قادر على إزاحة آلية الانحراف deflection mechanism

الشكل (١)

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PATENTS AND CERTIFICATES


PATENT COOPERATION TREATY

WO 2014/131476
PCT/TR2014/000052

ADVANCE E-MAIL

From the INTERNATIONAL BUREAU

PCT

SECOND AND SUPPLEMENTARY NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION (TO DESIGNATED OFFICES WHICH APPLY THE 30 MONTH TIME LIMIT UNDER ARTICLE 22(1))

(PCT Rule 47.1(c))

To:
CAYLI, Hulya
Paragon Consultancy Inc.
Koza Sokak 63/2 G.O.P.
06540 Ankara
TURQUIE

Date of mailing (day/month/year): 02 July 2015 (02.07.2015)

Applicant's or agent's file reference: 2039/PCT

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Applicant: KABAKCI, Ahmet, Sinan et al

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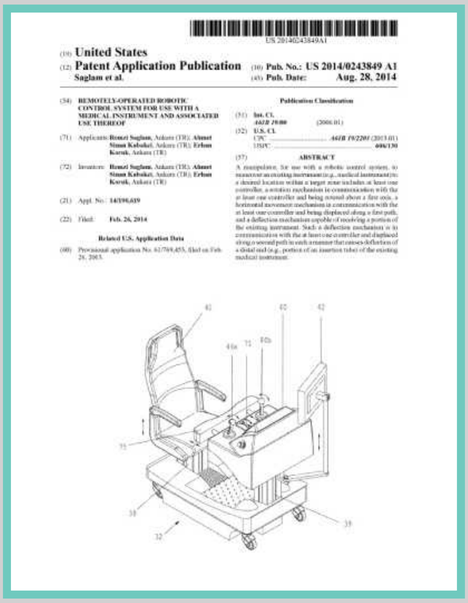
Authorized officer: Lingfei Bai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(54) REMOTELY-OPERATED ROBOTIC CONTROL SYSTEM FOR USE WITH A MEDICAL INSTRUMENT AND ASSOCIATED USE THEREOF

(71) Applicants: Remzi Saglam, Ankara (TR); Ahmet Sinan Kabakci, Ankara (TR); Erhan Koruk, Ankara (TR)

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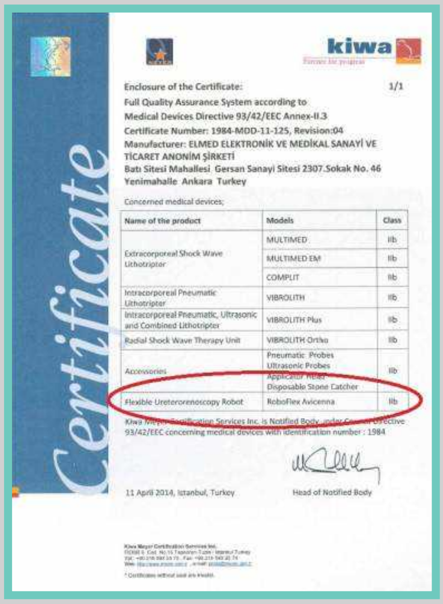
(57) ABSTRACT


Certificate

kiwa

Enclosure of the Certificate: 1/1

Full Quality Assurance System according to Medical Devices Directive 93/42/EEC Annex-II.3

Certificate Number: 1984-MDD-11-125, Revision:04

Manufacturer: ELMED ELEKTRONİK VE MEDİKAL SANAYİ VE TİCARET ANONİM ŞİRKETİ

Batı Sitesi Mahallesi Gersan Sanayi Sitesi 2307.Sokak No. 46 Yenimahalle Ankara Turkey

Concerned medical devices;

Name of the product	Models	Class
Extracorporeal Shock Wave Lithotripter	MULTIMED	IIb
	MULTIMED EM	IIb
	COMPLIT	IIb
Intracorporeal Pneumatic Lithotripter	VIBROLITH	IIb
Intracorporeal Pneumatic, Ultrasonic and Combined Lithotripter	VIBROLITH Plus	IIb
Radial Shock Wave Therapy Unit	VIBROLITH Ortho	IIb
Accessories	Pneumatic Probes Ultrasonic Probes Applicator Head Disposable Stone Catcher	IIb
Flexible Ureterorenoscopy Robot	RoboFlex Avicenna	IIb

Kiwa Certification Services Inc. is Notified Body under Directive 93/42/EEC concerning medical devices with identification number : 1984

11 April 2014, Istanbul, Turkey

Head of Notified Body

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