

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization

International Bureau

(43) International Publication Date  
12 December 2019 (12.12.2019)



(10) International Publication Number  
**WO 2019/236016 A1**

(51) International Patent Classification:

A61B 17/00 (2006.01) A61B 17/22 (2006.01)

(21) International Application Number:

PCT/TR2018/000057

(22) International Filing Date:

08 June 2018 (08.06.2018)

(25) Filing Language:

English

(26) Publication Language:

English

(72) Inventor; and

(71) Applicant: **ERAKGÜN, Ethem Tansu** [TR/TR]; 1379  
Sok. 37/14, Alsancak, Konak (TR).

(74) Agent: **YÜCE, Serfinaz Sibel**; Cemal Gürsel Cad. No:494  
Da:1, Bostanh, Karşıyaka/İzmir (TR).

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

Published:

— with international search report (Art. 21(3))

(54) Title: SURGICAL LASSO DEVICE DESIGNED FOR SUTURELESS SCLERAL INTRAOCULAR LENS FIXATION

(57) Abstract: The invention is a surgical lasso device designed for the sutureless scleral intraocular lens fixation comprising a cylindrical main body (1), a straight or curved cylindrical needle (2) with a thickness of approximately 0.2-0.6 mm having a pointed or blunt tip, a thin material (3) with shape memory made from polyol, nitinol or a similar substance, a trigger mechanism (4), an annular lasso (5) and a button (6). During the operation, the eye is entered via the needle (2) and the lasso (5) at the end of the thin material (3) is passed around the haptic of the lens (7) and is clamped. Then the button (6) is moved backwards, thus the lasso (5), together with the lens clamped in the same, is retracted into the needle (2) and is moved outside the sclera along with the needle (2). While outside, the lasso (5) of the thin material (3) is loosened to release the haptic of the lens (7).



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## SURGICAL LASSO DEVICE DESIGNED FOR SUTURELESS SCLERAL INTRAOCULAR LENS FIXATION

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### Technical Field

The invention relates to a surgical lasso device designed for sutureless scleral intraocular lens fixation.

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### Description of the Art

For the eyes with no posterior capsular support, the intraocular lens implantation may be performed via various methods. These may include the placement of the lens in the anterior chamber, iris fixation lenses, sutured lens placement in the sclera or iris and the sutureless lens fixation to the sclera via scleral tunnel.

One of the known methods for the sutureless lens fixation to the sclera includes entering the eye from the sclera with a needle in the form of a tunnel, introducing the lens haptic into said needle and externalizing and fixating the same. Another method involves using a trocar cannula and grasping and externalizing the lens haptic via this trocar with the help of a microforceps.

### Object of the Invention

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The object of the invention is to achieve the sutureless scleral intraocular lens fixation without introducing the lens haptic into the needle and without using a trocar when performing the sutureless lens fixation to the sclera via scleral tunnel for the intraocular lens implantation for the eyes with no posterior capsular support.

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### Brief Description of the Invention

According to the method described herein, the lens haptic is externalized and placed in the sclera in a sutureless manner by the use of a lasso, which is located at the end of a

pointed needle, is able to enter and exit via a mechanism and is thus able to grasp the haptic of the intraocular lens.

5 The surgical lasso device designed for the sutureless scleral intraocular lens fixation comprises a main body and a needle at the end of the main body, said needle having a thin, pointed or blunt tip, being straight or curved or angled and having a diameter of approximately 0.2-0.6 mm. Inside the needle, there is present a material made from a substance with shape memory (polyol, nitinol or a similar substance), said material reciprocating as linked to the mechanism in the main body and having an annular lasso  
10 at the end thereof.

As the trigger mechanism in the main body moves forward, the lasso at the end of the needle protrudes from the tip of the needle. While the lasso is in a state positioned at the tip of the needle, it is passed around the lens haptic and clamped, the trigger mechanism  
15 in the main body is moved backwards, and the lasso is pulled inside from the tip of the needle together with the lens and is moved outside the sclera along with the needle. While outside, the lasso is loosened to release the lens haptic.

#### **The Figures to Aid in the Description of the Invention:**

20 The surgical lasso device designed for the sutureless scleral intraocular lens fixation according to the invention is described in more detail with the help of the following drawings provided by way of example, in which:

25 **Figure-1:** A view of the surgical lasso device designed for the sutureless scleral intraocular lens fixation in a state with the lasso being located inside same

**Figure-2:** A view of the surgical lasso device designed for the sutureless scleral intraocular lens fixation in a state with the lasso being located outside same

30 **Figure-3:** A view of the surgical lasso device designed for the sutureless scleral intraocular lens fixation at the instance the lasso thereof grasps the lens

**Figure-4:** A view of the surgical lasso device designed for the sutureless scleral intraocular lens fixation at the instance it clamps the lens and pulls the same into the tube from the needle tip

35 **Figure-5:** A view of the surgical lasso device designed for the sutureless scleral intraocular lens fixation at the instance it takes the lens into the tube

## Reference Numerals to Aid in the Description of the Invention

- 1- Main body
- 2- Needle
- 5 3- Thin material
- 4- Trigger mechanism (spring, etc.)
- 5- Lasso
- 6- Button
- 7- Lens

## 10 Description of the Invention

The invention is a surgical lasso device designed for the sutureless scleral intraocular lens fixation comprising a cylindrical main body (1), a straight or curved needle (2) with a thickness of 0.2-0.6 mm having a pointed or blunt tip, a thin material (3) with shape  
15 memory having a cylindrical structure made from polyol, nitinol or a similar substance, a trigger mechanism (4), an annular lasso (5) and a button (6) (Figure-1).

Inside said needle (2), there is present a very thin material (3) with shape memory made from polyol, nitinol or a similar substance, said material reciprocating as linked to the  
20 trigger mechanism (4) in the main body (1), wherein there is present an annular lasso (5) at the end of said material (3) (Figure-1, Figure-2).

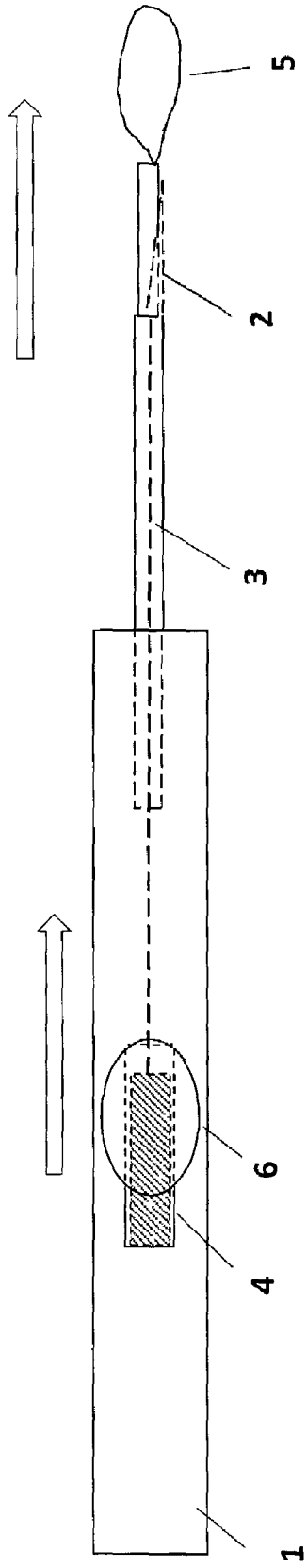
When the trigger mechanism (4) in the main body (1) is moved forward via the button (6) to which it is connected, the thin material (3) moves forward inside the needle (2) and  
25 thus the lasso (5) at the end of the same also moves forward to protrude from the tip of the needle (2) (Figure-1). When the button (6) is moved backwards, the thin material (3) moves backwards inside the needle (2) and thus the lasso (5) at the end of the same also moves backwards to enter via the tip of the needle (2) (Figure-2). During the operation, the eye is entered via the needle (2), the lasso (5) at the end of the thin material (3) is  
30 passed around the haptic of the lens (7) and is clamped (Figure-3, Figure-4). Then the button (6) is moved backwards, thus the lasso (5), together with the lens clamped in the same, is retracted into the needle (2) (Figure-5) and is moved outside the sclera along with the needle (2). While outside, the lasso (5) of the thin material (3) is loosened to release the haptic of the lens (7).

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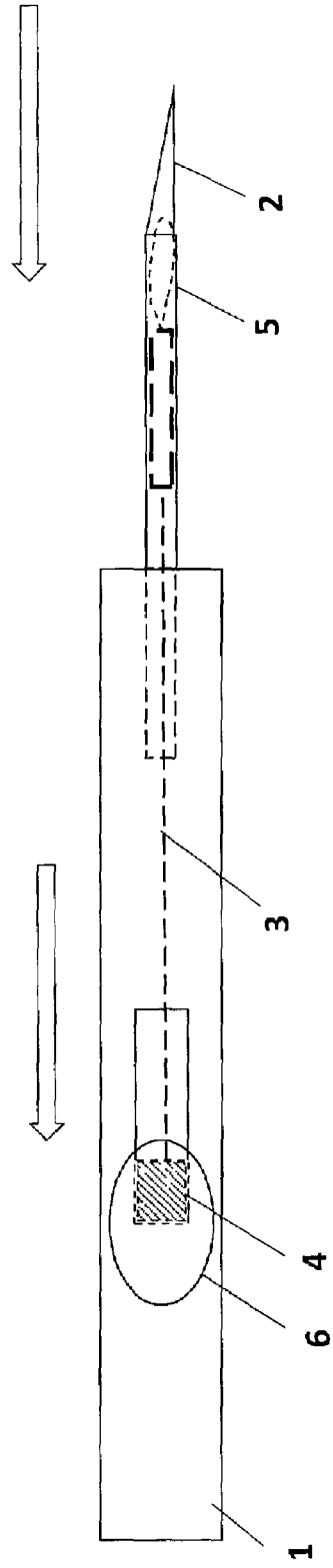
**CLAIMS**

- 5 1. Surgical lasso device designed for the sutureless scleral intraocular lens fixation characterized in that it comprises a cylindrical main body (1), a straight or curved cylindrical needle (2) with a thickness of approximately 0.2-0.6 mm having a pointed or blunt tip, a thin material (3) with shape memory made from polyol, nitinol or a similar substance, a trigger mechanism (4), an annular lasso (5) and a button (6).
- 10 2. Surgical lasso device designed for the sutureless scleral intraocular lens fixation according to Claim 1 characterized in that it comprises a trigger mechanism (4) connected to the button (6) on said cylindrical main body (1) and a thin material (3) with shape memory (made from polyol, nitinol or a similar substance) reciprocating inside the main body (1) and inside the needle (2) as linked to said
- 15 trigger mechanism (4).
- 20 3. Surgical lasso device designed for the sutureless scleral intraocular lens fixation according to Claim 1 or 2 characterized in that it comprises an annular lasso (5), which is located at the end of the thin material (3) that moves forward upon the trigger mechanism (4) being moved forward via the button (6) on the main body (1) and which moves forward to protrude from the tip of the needle (2).
- 25 4. Surgical lasso device designed for the sutureless scleral intraocular lens fixation according to the preceding claims characterized in that it comprises a straight or curved cylindrical needle (2) positioned at the end of said main body (1), said needle having a thickness of approximately 0.2-0.6 mm and having a pointed or blunt tip, and it further comprises a thin material (3) with shape memory that reciprocates inside said needle (2) and it further comprises an annular lasso (5) at
- 30 the end of said thin material (3), said lasso moving inwards-outwards from the interior of the needle (2).

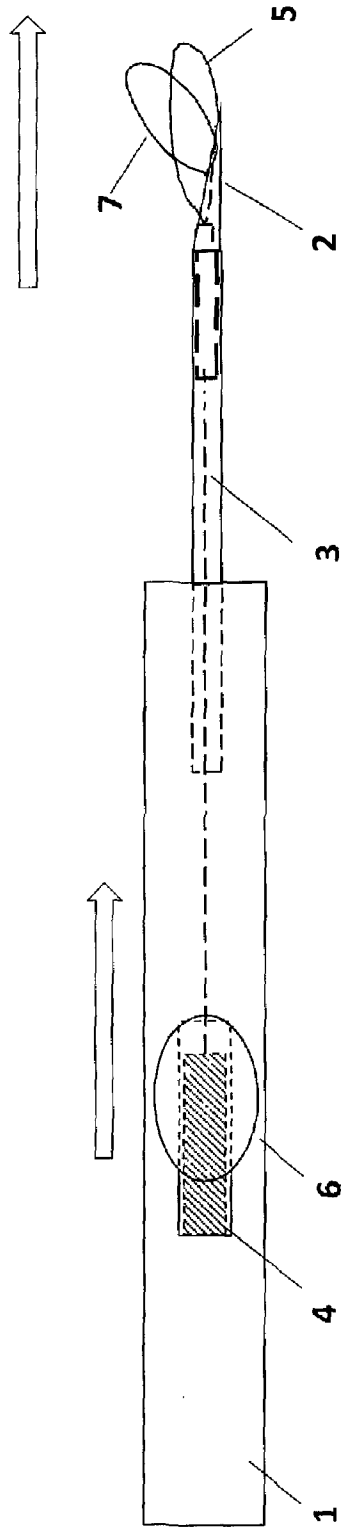
5. Surgical lasso device designed for the sutureless scleral intraocular lens fixation according to the preceding claims characterized in that it comprises a needle (2) introduced to the eye in order to lift the haptic of the lens in the eye and an annular lasso (5), which is intended to protrude from said needle (2) and to be passed around the lens haptic to clamp the lens and pull the lens into the needle (2), thereby moving the lens outside the sclera along with the needle (2) without using any other instrument.



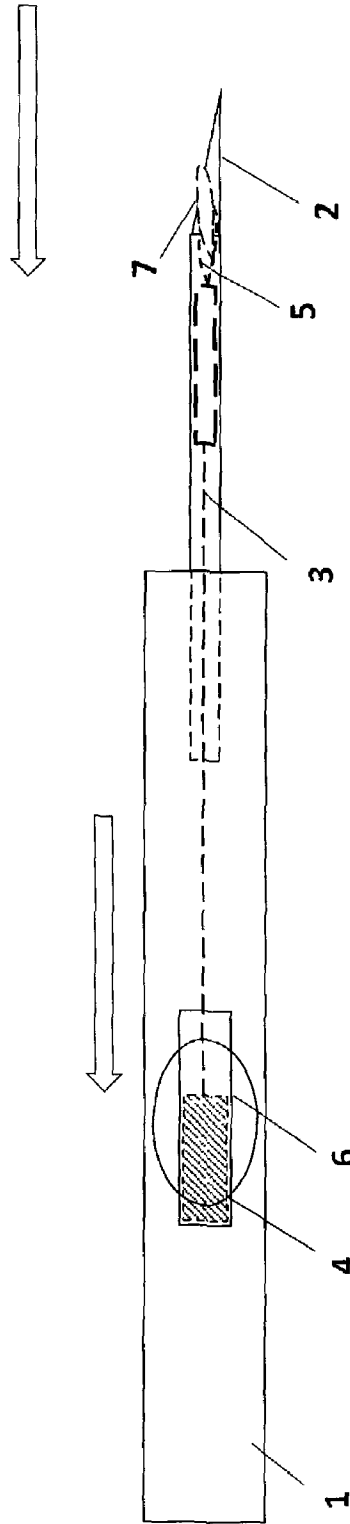
Picture -1



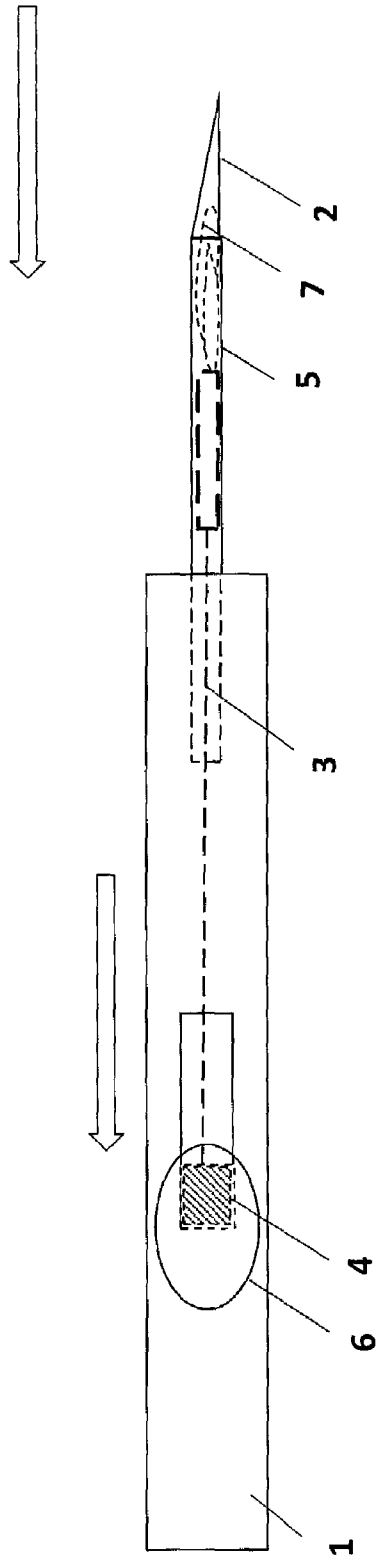
Picture -2



Picture -3



Picture -4



Picture -5

## INTERNATIONAL SEARCH REPORT

International application No.

**PCT/TR2018/000057**

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
A61B 17/00 (2006.01)i; A61B 17/22 (2006.01)i		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) A61B 17/00; A61B 17/22		
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)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2017143272 A2 (NEW WORLD MEDICAL INC [US]) 24 August 2017 (2017-08-24) Abstract, par. [00160-00162], fig.24-30	1-5
X	WO 2014035862 A1 (UNIV COLORADO REGENTS [US]) 06 March 2014 (2014-03-06) description page 4-6, fig.1-5	1-5
X	US 2016074220 A1 (IANTECH INC [US]) 17 March 2016 (2016-03-17) par. [0047], [0084], Fig.1-30	1-5
A	WO 9520919 A1 (GALAN NIETO PABLO ANTONIO [ES]) 10 August 1995 (1995-08-10) whole document	1-5
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
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Date of the actual completion of the international search <b>03 May 2019</b>		Date of mailing of the international search report <b>03 May 2019</b>
Name and mailing address of the ISA/TR <b>Turkish Patent and Trademark Office (Turkpatent) Hipodrom Caddesi No. 115 06560 Yenimahalle Ankara Turkey</b> Telephone No. (90-312) 303 11 82 Facsimile No. +903123031220		Authorized officer  <b>Ali Riza Köker</b>  Telephone No. +903123031198