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- (71) **Applicant: XIROS LIMITED** [GB/GB]; Springfield House, Whitehouse Lane, Leeds Yorkshire LS19 7UE (GB).
- (72) **Inventors: SEEDHOM, Bahaa Botros;** C/O Xiros Limited, Springfield House, Whitehouse Lane, Leeds Yorkshire LS19 7UE (GB). **ROBINSON, Corey James;** C/O Xiros Limited, Springfield House, Whitehouse Lane, Leeds Yorkshire LS19 7UE (GB).
- (74) **Agent: ORR, Robert;** Urquhart-Dykes & Lord LLP, Arena Point, Merrion Way, Leeds Yorkshire LS2 8PA (GB).
- (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.
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(54) **Title:** DEVICE, ASSEMBLY AND METHOD FOR USE IN TENDON REPAIR

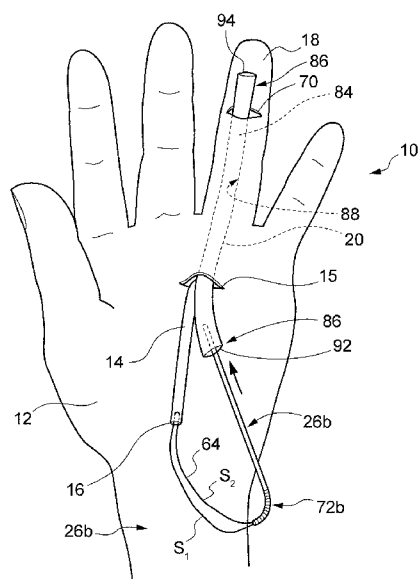


Fig. 16

(57) **Abstract:** An assembly for use in repairing a severed tendon comprises an elongate threading element adapted to transit along a lumen of a tendon sheath, for covering a curved needle and carrying the needle within the lumen. The assembly can also comprise a liner for lining an internal surface of the tendon sheath, defining an internal passage along which a tendon stump coupled to the curved needle can pass. The liner can have a collapsed, rest configuration in which it is adapted to be inserted into the lumen of the tendon sheath, and an expanded, operating configuration, the liner being movable to the expanded configuration by contact with the tendon stump. Once released from the liner, the threading element receives the curved needle, for covering and carrying the curved needle through the liner and along the lumen of the tendon sheath trailing the connected tendon stump.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/04 A61B17/11
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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)
A61B A61F
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	US 5 741 299 A (RUDT LOUIS L [US]) 21 April 1998 (1998-04-21) column 4, line 30 - line 56; figures 1-5 column 5, line 8 - line 27 -----	1,2,11
X	US 5 236 443 A (SONTAG SIDNEY [US]) 17 August 1993 (1993-08-17) column 3, line 56 - column 4, line 25; figures 1,2 -----	1,2,11
X	US 5 549 629 A (THOMAS STACY I [US] ET AL) 27 August 1996 (1996-08-27) the whole document -----	1,2,11
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 14 November 2019	Date of mailing of the international search report 17/12/2019
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Roudaut, Tanguy
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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2019/051686

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 108 316 A1 (TYCO HEALTHCARE [US]) 14 October 2009 (2009-10-14) figures 1A-1C paragraph [0009] paragraph [0018]	1,2
X	----- FENNELL NATHALIE ET AL: "Principles of tendon repair", SURGERY, MEDICINE PUBLISHING, ABINGTON. / ELSEVIER IMPRINT, GB, vol. 34, no. 3, 15 March 2016 (2016-03-15) , pages 152-156, XP029485574, ISSN: 0263-9319, DOI: 10.1016/J.MPSUR.2016.01.007 page 155, column 1, paragraph 1	1-3
X	----- MUHAMMED BESIR OZTURK ET AL: "Atraumatic Flexor tendon retrieval- a simple method", ANNALS OF SURGICAL INNOVATION AND RESEARCH, BIOMED CENTRAL LTD, LO, vol. 7, no. 1, 16 September 2013 (2013-09-16), page 11, XP021165061, ISSN: 1750-1164, DOI: 10.1186/1750-1164-7-11 page 2, column 1, paragraph 1; figures 1,3,4	1-3
X	----- US 2013/144310 A1 (GORDON LEONARD [US] ET AL) 6 June 2013 (2013-06-06) cited in the application paragraph [0197]; figures 1,2A-2F,13A-14D paragraph [0069] paragraph [0071] paragraph [0073] paragraph [0193] paragraph [0199] paragraph [0201] paragraph [0202]	1-3,5-8
A	----- US 2011/172706 A1 (KAPPEL GARY [US] ET AL) 14 July 2011 (2011-07-14) abstract; figures 1A,1B	1-11
A	----- WO 03/003931 A1 (HERZZENTRUM DRESDEN GMBH [DE]; CORNELIUS MIRKO [DE] ET AL.) 16 January 2003 (2003-01-16) abstract; figures 1,2	1-11
X	----- EP 1 137 367 A1 (ADAMS BRIAN D [US]) 4 October 2001 (2001-10-04) figures 1,2,13-22	52-55,60
A	paragraph [0014] - paragraph [0015] paragraph [0023] - paragraph [0024] paragraph [0054] - paragraph [0057]	12-31, 56-59,61
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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2019/051686

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 2012/071975 A1 (GONZALEZ-HERNANDEZ EDUARDO [US]) 22 March 2012 (2012-03-22) figures 14-20 paragraph [0057] - paragraph [0062] -----	12-31, 52-61
A	US 5 897 591 A (KOBAYASHI MASANORI [JP]) 27 April 1999 (1999-04-27) column 4, line 66 - column 5, line 21; figures 1A-3 -----	12-31, 52-61

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2019/051686

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 32-51
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 32-51

Claims 32 to 51 relate to a method for treatment of the human or animal body by surgery, practised on the human or animal body, namely a method of retrieving a tendon stump of a severed tendon (claims 32 to 42) and a method comprising the steps of advancing a liner through a lumen of a tendon sheath and a needle through the liner (claims 43 to 51) (Rule 39.1 (iv) PCT). Consequently, no opinion will be formulated with respect to the novelty, inventive step and industrial applicability of the subject-matter of these claims (Article 17(2)(a)(i) PCT).

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11

A needle covering and carrying device for covering a curved needle and carrying the needle within a lumen of a tendon sheath, the device comprising an elongate element having: a first end; a second end opposite the first end; and a body extending between the first and second ends, the body defining an internal cavity for accommodating a curved needle so that at least a penetrating tip of the needle is disposed within the body, to protect the tendon sheath from damage through contact with the tip during passage of the needle within the sheath; in which at least part of the body is pre-curved to accommodate the curved needle or is deformable and capable of being deformed into a curved shape so that it can accommodate the curved needle.

2. claims: 12-31, 52-61

An assembly for use in repairing a severed tendon, the assembly comprising:
a threading element adapted to transit along a lumen of a tendon sheath; and
a liner for lining an internal surface of the tendon sheath, the liner defining an internal passage along which a tendon stump can pass during transit along the lumen, the liner acting to restrict contact between the tendon stump and the internal surface of the tendon sheath;
in which the liner is adapted to be releasably coupled to the threading element so that it can be drawn into the tendon sheath by the threading element and located within the lumen, and then released from the threading element so as to reside within the lumen.
Or a kit for use in repairing a severed tendon, the kit comprising:
an elongated tubular liner defining a lumen, the liner being radially collapsible or foldable to a reduced diameter for insertion through a tendon sheath and expandable to accommodate a needle advanced through the liner when the liner is positioned in the tendon sheath.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/GB2019/051686

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5741299	A	21-04-1998	NONE

US 5236443	A	17-08-1993	NONE

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			CA 2661709 A1 11-10-2009
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			US 5897591 A 27-04-1999
