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(54) Title: IMPLANTS AND METHOD FOR FORMING AN IMPLANT

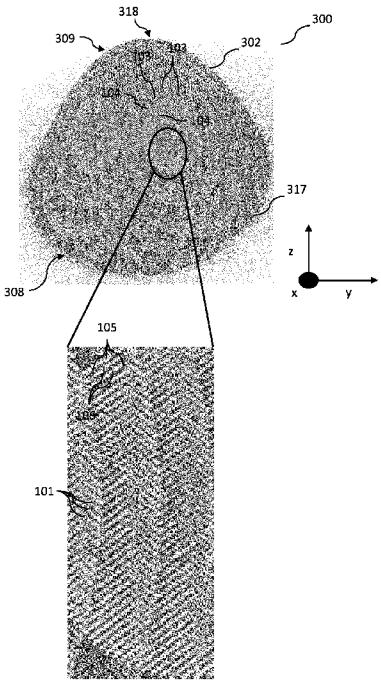


Fig. 3A

(57) Abstract: Embodiments herein relate to a three-dimensional implant for tissue reconstruction or tissue augmentation for insertion into a patient. The implant comprises a plurality of strands forming a three-dimensional structure, which comprises a plurality of hollow channels. Each hollow channel comprises a plurality of sidewalls. A sidewall comprises a plurality of strand segments and a plurality of gaps arranged altematingly so that a gap is formed between adjacent strand segments of the sidewall. The gap comprises a gap length (gl) and a resting gap height (gh). The plurality of gaps are reversibly expandable gaps. Adjacent strand segments comprise a deflection capability (δ) based on an object to be received by the reversibly expandable gap. A radius (R) of the plurality of strands and a gap lengths (gl) of a reversibly expandable gap is based on a yield strength (δ_{yield}), the elastic modulus (E) of the material and a deflection capability δ of the adjacent strand segments forming the reversibly expandable gap.

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[Continued on next page]

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2021/070353

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.:
because they relate to subject matter not required to be searched by this Authority, namely:

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.

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61F2/00 A61F2/12 B33Y10/00 B33Y80/00
ADD.

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)
A61F B33Y

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 Y	WO 2019/238716 A1 (BELLASENO GMBH [DE]) 19 December 2019 (2019-12-19) page 3, line 15 - page 4, line 33 page 13, line 19 - page 15, line 3 page 17, line 29 - page 20, line 32 figures 1-6, 13A-13C	1-12, 14-16 13,17,18
X	WO 2019/217335 A1 (MENTOR WORLDWIDE LLC [US]) 14 November 2019 (2019-11-14) paragraph [0036] - paragraph [0038] paragraph [0049] paragraph [0070] - paragraph [0075] paragraph [0079] figures 1a-1e	1-12,15, 16

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[x] Further documents are listed in the continuation of Box C.

[x] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 February 2022	16/02/2022

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Serra i Verdaguer, J

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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2014/255647 A1 (JOHNSON KEVIN C [US] ET AL) 11 September 2014 (2014-09-11) paragraph [0005] - paragraph [0007] paragraph [0024] - paragraph [0025] figures 2, 31-49 paragraph [0080] - paragraph [0084]	13,17,18
X	EP 2 995 278 A1 (KLINIKUM RECHTS DER ISAR DER TECH UNIVERSITÄT MÜNCHEN [DE]) 16 March 2016 (2016-03-16) paragraph [0080] - paragraph [0096] paragraph [0099] paragraph [0165] - paragraph [0174] figures 7-11	1-18
X	US 6 993 406 B1 (CESARANO III JOSEPH [US] ET AL) 31 January 2006 (2006-01-31)	17,18
Y	column 1, line 13 - line 18; figure 1 column 6, line 8 - line 61	13
X	US 2014/243995 A1 (KOLEWE MARTIN E [US] ET AL) 28 August 2014 (2014-08-28)	17,18
Y	paragraph [0050] - paragraph [0061]; figures 2a-3d,8,10 paragraph [0022]	13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2021/070353

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		WO 2014133805 A1	04-09-2014

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-16

A three-dimensional implant for insertion into a patient, wherein the plurality of gaps of the sidewalls are reversibly expandable gaps and a method for forming such an implant

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2. claims: 17, 18

A three-dimensional implant for insertion into a patient, wherein at least one sidewall is an undulating sidewall

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