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(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: SURGICAL INSTRUMENT COMPRISING SYNCHRONIZED DRIVE SYSTEMS

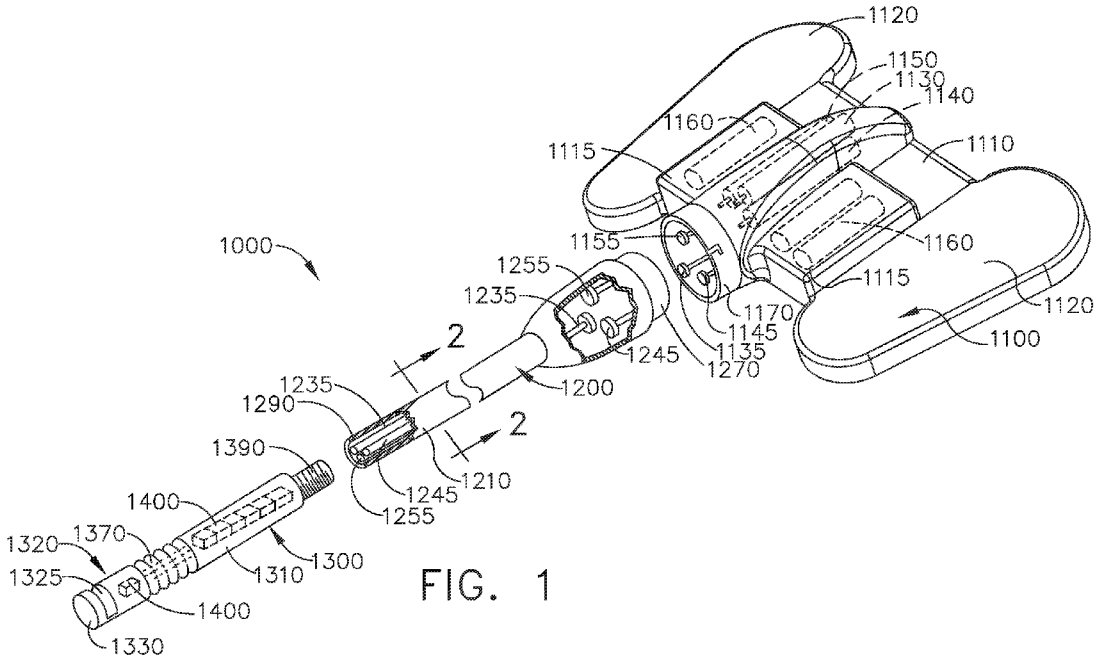


FIG. 1

(57) Abstract: A surgical instrument for treating the tissue of a patient is disclosed. The surgical instrument comprises a handle, a shaft extending from the handle, and an end effector. The surgical instrument further comprises a motorized drive system, a first drive system configured to perform a first end effector drive motion, wherein the first drive system is operably coupled to the motorized drive system, and a second drive system configured to perform a second end effector drive motion, wherein the second drive system is operably coupled to the motorized drive system. The surgical instrument further comprises synchronizing means for repetitively sequencing the first end effector drive motion and the second end effector drive motion.

[Continued on next page]

(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).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

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

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

— *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*

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06 September 2019 (06.09.2019)

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2018/059838

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/072
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)
A61B

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.
Y A	WO 2015/191228 A1 (ETHICON ENDO SURGERY INC [US]) 17 December 2015 (2015-12-17) para. 252, 259, 267, 369; figures 128-135	1-7,11 8-10
Y A	CA 2 725 181 A1 (ETHICON ENDO SURGERY INC [US]) 29 November 2007 (2007-11-29) para. 10, 14, 15; figure 2	1-7,11 8-10
X A	WO 2012/166499 A1 (ETHICON ENDO SURGERY INC [US]; SPIVEY JAMES T [US]; ORTIZ MARK S [US];) 6 December 2012 (2012-12-06) para. 221-232; figures 20, 21, 39-41	1-7,11 8-10

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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

"E" earlier application or patent but published on or after the international filing date

"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)

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
5 July 2019	19/07/2019

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	Kamp, Martin

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

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International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 2016/160367 A2 (ETHICON ENDO-SURGERY LLC [US]) 6 October 2016 (2016-10-06) para. 65-69; figures 1-15 -----	12-16, 18-20 1,2,17
X A	WO 2016/137810 A1 (ETHICON ENDO-SURGERY LLC [US]) 1 September 2016 (2016-09-01) figures 79-84 -----	12-16, 18-20 17
X A	EP 0 552 050 A2 (ETHICON INC [US]) 21 July 1993 (1993-07-21) figures 2, 3, 7, 8 -----	12-16, 18-20 17

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2018/059838

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

Information on patent family members

International application No
PCT/IB2018/059838

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Information on patent family members

International application No
PCT/IB2018/059838

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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-7, 11(completely); 8-10(partially)

A surgical stapler comprising
a handle,
a shaft,
an end effector,
a motorized drive system comprising a rotatable drive shaft;
an anvil closing system and
a propulsion system.

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2. claims: 12-20(completely); 8-10(partially)

A surgical instrument comprising
a handle,
a shaft,
an end effector,
a motorized drive system comprising a rotatable drive shaft and a synchronizing mechanism,
a first drive system configured to perform a first end effector drive motion;
a second drive system configured to perform a second end effector drive motion.
